PRELIMINARY VISUAL IMPACT STUDY:

PROPOSED ALBANY WIND ENERGY FACILITY

On Behalf of Indalo Protected Environment

August 2021

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ABBREVIATIONS

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CES	Coastal and Environmental Services
ECPTA	Eastern Cape Parks and Tourism Agency
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment

EIR	Environmental Impact Report
EScience	EScience Associates (Pty) Ltd
GIS	Geographic Information Systems
Ha	Hectare
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
NEMPAA	National Environmental Management: Protected Areas Act
NHRA	National Heritage Resources Act
PGR	Private Game Reserve
REDZ	Renewable Energy Development Zone
VIS	Visual Impact Study
VIA	Visual Impact Assessment
WEF	Wind Energy Facility
ZVI	Zone of Visual Influence

GLOSSARY OF LANDSCAPE TERMS

The following glossary of terms was sourced from (Marot & Kruse, 2018).

ENERGY LANDSCAPE

An energy landscape is characterized by one or more elements of the energy chain (e.g. energy extraction, assimilation, conversion, storage, transport or transmission of energy).

The outcome can be a multi-layer energy landscape comprising combinations of technical and natural sources of energy within a landscape.

LANDSCAPE

(1) An area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors.

(2) An area (spatial component) as perceived by people (subjective component), whose sensually perceivable features (link to aesthetics in the original meaning of the Greek 'aisthesis') and character (Alexander von Humboldt's definition of landscape) are the result (evolutionary/temporal aspect of landscape) of the action of natural and/or cultural factors (holistic view of landscape).

(3) The Swedish primary definition of the word landscape (*swe. landskap*) denotes the conditions in a country, a country's character, and/or a country's traditions. Originally, landskap was strongly related to customs, ideas of homeland, justice, nature, and nation [1] (cited in [2] . Landskap was a social space that denoted a territory and its people, and connoted aspects of custom, value, and everyday life.

(4) For many people, landscape simply means scenery – everything that is around us and can be viewed at one time from one place on the horizon – or all the visible features of an area, considered for their aesthetic appeal.

LANDSCAPE AWARENESS

Landscape awareness refers to deeper understanding of the value of landscapes, their role and changes to them, among the civil society, private organisations and public authorities.

European Landscape Convention marks the importance of awareness-raising which is defined as a way of making clear the relations that exist between people's cadre de vie,

[1] Olwig, K. R. (1996). Recovering the substantive nature of landscape. Annals of the Association of American geographers 86(4), 630–653.

[2] Marot, N., & Kruse, A. (2018). Towards common terminology on energy landscapes. Journal of Landscape Ecology: Special Issue 2, 59-63.

the activities pursued by all parties in the course of their daily lives and the characteristics of the natural environment, housing and infrastructure[3] (cited in [2]).

LANDSCAPE CAPACITY

Landscape capacity refers to the degree to which a particular landscape character type or area is able to accommodate change without significant effects on its character, or overall change of landscape character type. Capacity is likely to vary according to the type and nature of change being proposed.

LANDSCAPE CHARACTER

The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape. It is a standard methodology for identifying, describing, classifying and mapping what is distinctive about landscapes. It is used in the assessment of landscape impacts for land use changes.

LANDSCAPE CLASSIFICATION

Landscape classification is a means of grouping different types of landscapes into categories to address similar types at once. Classification is important for communication because it provides a consistent frame of reference. As the classification of landscapes is complicated by the fact that it involves both human perception and physical reality, there are many different attempts, according to nationality but also to scientific background. EUCALAND set-up a European Agricultural Landscape classification based on identity, pattern, process, change, spatial relationship, social organisation and topography with 10 different classes. Landscape classification is a basis of the research on landscape structure, process, and function, and also, the prerequisite for landscape evaluation, planning, protection, and management, directly affecting the precision and practicability of landscape research.

LANDSCAPE FUNCTION

The flows of social, economic and ecological benefits that land may generate. In the context of Ecosystem Services, this can be described as the capacity of land for ecosystem service production.

[3] Council of Europe. (2000). European Landscape Convention. Florence: Council of Europe.

LANDSCAPE IDENTITY

Landscape identity is related to the character and the tangible and intangible characteristics that shape the feeling of a person belonging to a landscape. Identity of a landscape is the sum of the different information layers drawing on for example the territory, cultural elements, natural resources, and current use.

The Spanish: key naturalists Martinez de Pison (2000) and Gonzalez Bernaldez (1981) have referred to this concept saying landscape identity comes with the person; it is a bag full of information of what we are carrying.

LANDSCAPE QUALITY

The perception of the holistic environmental, cultural, sensory and psychological characteristics of a landscape with respect to their benefits or significance to people. It is relative, not absolute, requiring interpretation in the context of geographic scale (i.e. local, regional, national) and, or human experience.

LANDSCAPE RESILIENCE

Landscape resilience is its capacity for renewal in a dynamic environment. Its characteristics are flexibility, adaptability, and ability to withstand change.

LANDSCAPE SENSITIVITY

The degree to which the character and qualities of the landscape are affected by specific types of development and land-use change.

LANDSCAPE SERVICES

The contributions of landscapes and their components to human well-being. Landscape Services is a concept complementary to that of Ecosystem Services.

LANDSCAPE VULNERABILITY

In landscape planning, vulnerability is defined as 'vulnerability to impact', and the likelihood of change to, or loss of, landscape features. Its level is a reflection of the significance of the functions of such features.

LAND USE CONFLICTS

A land use conflict is a situation where there is a disagreement on the use of a certain piece of land and/or a belief that people's rights or well-being are being threatened by an action or undertakings of another, or the inaction of another party.

The origins of most land use conflicts is when a land use, a project or an action is incompatible with the views, expectations and values of the people living, working and/or vacationing in a potentially affected area.

VISUAL IMPACT

Change to the appearance of the landscape as a result of a development which can be positive (improvement) or negative (detraction) and the associated changes in the human visual experience of the landscape.

LANDSCAPE ASSESSMENT

The purpose of landscape assessment in landscape planning is to support the identification of landscape values, development opportunities and management options. It is a broad term referring to various assessment types that may be classified by their objective as resource (opportunities for specific uses), capacity (constraints for specific uses) and other (not necessarily planning orientated) assessments (e.g. formal aesthetic, character, ecological assessments). Assessments can take account of quantitative and qualitative (descriptive or depictive) factors.

VISUAL ASSESSMENT

Visual assessment (called also Visual Impact Assessment – VIA) is the process (including analysis) of taking account of the effects of certain types of development on the visual landscape, usually prior to implementation. The term Visual Impact Assessment was coined as part of Environmental Impact Assessment in the US National Environmental Policy Act of 1969.

1 INTRODUCTION

This report was commissioned by Indalo Private Game Reserve Association which is an association of landowners from nine internationally renowned private game reserves ("PGRs") in the Eastern Cape Province of South Africa which has brought some 76 000 ha of land under formal protection.[4] Indalo is currently actively working with local provincial and national partners including SANParks, ECPTA and the Wilderness Foundation South Africa, to expand areas under protection through further amalgamation of private reserves to achieve numerous >50 000Ha agglomerations of formal protected areas. This will be done, amongst other ways, by forming public-private partnerships with Addo Elephant National Park (AENP) and the Great Fish (and various other provincial nature reserves).

This report serves as Preliminary Visual Impact Study (VIS) for the proposed Albany Wind Energy Facility (WEF) and adjacent WEFs on Indalo Protected Environment and the Great Fish Provincial Nature Reserve (Great Fish PNR). The report serves to document a systematic analysis of impacts as well as documents an assessment of landscape sensitivity, and presents preliminary findings on the impact of the proposed WEF and does not cover the impact to all sensitive receptors within Great Fish PNR and its surrounds, and does not consider impact to Great Fish PNR tourism development plans.

Additionally, it is limited to the extent that it aims to provide insight on and basis for commentary to the Visual Impact Assessments (hereinafter referred to as 'The VIA Reports', prepared by CES, as part of the Draft Basic Assessment Report(BAR).

1.1 OBJECTIVES

The objective is to create high quality view simulations from important/sensitive viewpoints in order to assess the accuracy of the findings of the CES VIA Reports, accompanied by a visual impact assessment/appraisal motivating the view simulation results.

[4] These PGRs are the Amakhala Game Reserve, Hopewell Game Reserve, Kariega Game Reserve, Kwandwe Game Reserve, Oceana Beach and Wildlife Reserve, Pumba Game Reserve, Shamwari Game Reserve, Sibuya Game Reserve, and the Lalibela Game Reserve. The 9 PGRs are located over 3 local municipalities in the Sarah Baartman District Municipality of the Eastern Cape Province.

1.2 AUTHORS AND RELEVANT EXPERIENCE

This report has been compiled on behalf of EScience Associates and Mr JK Geldenhuys (visual specialist and Associate of EScience), with relevant associations and experience listed below:

Authors	Experience
Theo Fischer- Energy Environmental Specialist	20 Years
Kotie Geldenhuys- Visual Impact Assessor	10 Years
Sam Leyde- Environmental Specialist	5 Years

2 SCOPE OF STUDY

2.1 PROJECT TASKS

The following tasks have been performed:

- Familiarisation with project and project background including WEF turbine layout and design specifications, as well as characterisation receiving environment.
- Preliminary desktop study, incorporating the generation of GIS data (locality, land use, vegetation, morphology, biomes, general sensitivity).
- Preparation of GIS data, pertaining to the topography, vegetation and land use of the area.
- Daytime dusk and night time photographing of VIA selected views.
- An extensive audit of the receiving environment's Sense of Place.
- The execution of daytime view simulations as viewed from current and additional vantage points, providing decision makers with a realistic, representative visual reference of what may be expected.
- Consideration of impact to nature and wildlife tourism receptors in terms of broad regional aesthetic impacts.

The assessment process is summarised as a flow chart in Figure 2-1.

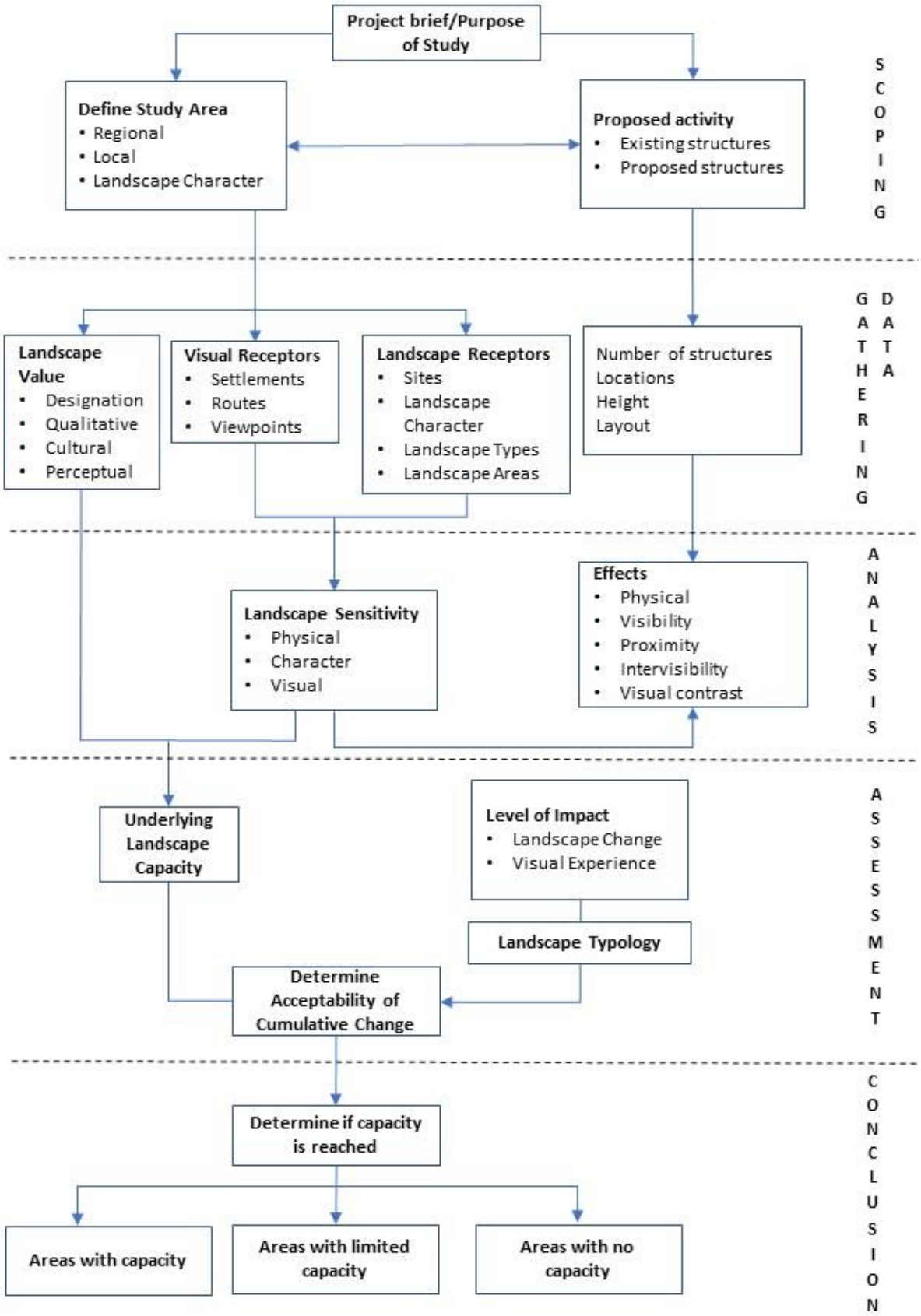

Figure 2-1: Cumulative Impact and Landscape Capacity Methodology Flowchart

2.2 NATURE AND DESCRIPTION OF THE DEVELOPMENT

The reports indicates that the capacity of the Albany installation will be 297 MW and that there will be 43 wind turbines.

It is indicated that there will be a maximum hub height of up to 130m. The tip height of the turbines will be up to 215m. The proposed development envelopes cover a substantial area, measuring approximately 6300 hectares together. Refer to Figure 2-4 and Figure 2-5 for the location of the proposed WEF in relation to potential visual receptors.

Turbines are proposed to be situated on elevated ground and otherwise on heights similar or elevated to that of parts of Kwandwe and Great Fish PNR thus rendering them visible across great distances.

Refer to Figure 2-4 and Figure 2-5 for the location of the proposed WEF in relation to potential visual receptors.

2.3 NATURE OF THE AREA PRE-DEVELOPMENT

Landscape is not a commodity arising in easily identifiable units. It has no discrete quanta (like an area with unit of square dimension). It is rather multidimensional.

2.3.1 LANDSCAPE SITUATION ANALYSIS

This review provides key observations about the landscape of the surrounding nature reserves and the proposed development site. The landscape character *("The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape."*[2]*)* of the area is as follows:

- The Kwandwe PE, Great Fish PNR and other nature reserves and game farms is defined by topography that ranges from 95 metres above sea-level to 561 metres above sea-level and consists mainly of steep cliffs dropping down into river valleys and broken inter-basin ridges. The areas host a diversity of biomes and significant topographical elements and with differing height and aspect has a number of biomes including Nama-Karoo, Cape heathland, grassland, forest and subtropical thicket. These biomes, along with variation in aspect and relief, create a diverse landscape that is often layered in depth and variable in texture through change in landcover and/ or distance.

- A significant part of the landscape is characterized by large contiguous pristine, undisturbed or fully rehabilitated shrubland with very little if any visual intrusion of infrastructure and can be characterised as wilderness area. Accordingly, Kwandwe PE, Great Fish PNR and surrounding wilderness areas has a rich variety of natural viewsheds, due to the intersection of a variety of landscapes and vegetation types present.
- Kwandwe PE, Great Fish PNR and surrounding activities that relies on wilderness experience derives its sense of place from the diversity of natural vistas scenery, land- and riverscapes that is to a significant degree defined by views derived from outside the protected areas and specifically has significant exposure to the proposed area of development.
- Landscape function of the proposed site of development provides social, economic and ecological benefits (and due to serving as part of Kwandwe PE, Great Fish PNR viewshed is part of the Protected Area Goods and Services offering) and the serves as scenic backdrop to many views for Kwandwe PE, Great Fish PNR game viewing area and visitor experience.
- Due to the developments' very large footprint, the height and visual contrast of wind turbines and the network of roads that will provide access to construction and maintenance of the power generation infrastructure, the elevation of both development site and receiving environment, and the subsequent visibility of the proposed development across great distances, the receiving environment that is visually impacted is expansive. The receiving environment covers various land uses and economic activities and is not easily characterised.

Refer to Figure 2-2 and Figure 2-3 for examples of the sense of place of the receiving environment. Refer to Annexure A for further images displaying the sense of place.

Figure 2-2: Sense of place of the area - View from Kwandwe Private Game Reserve

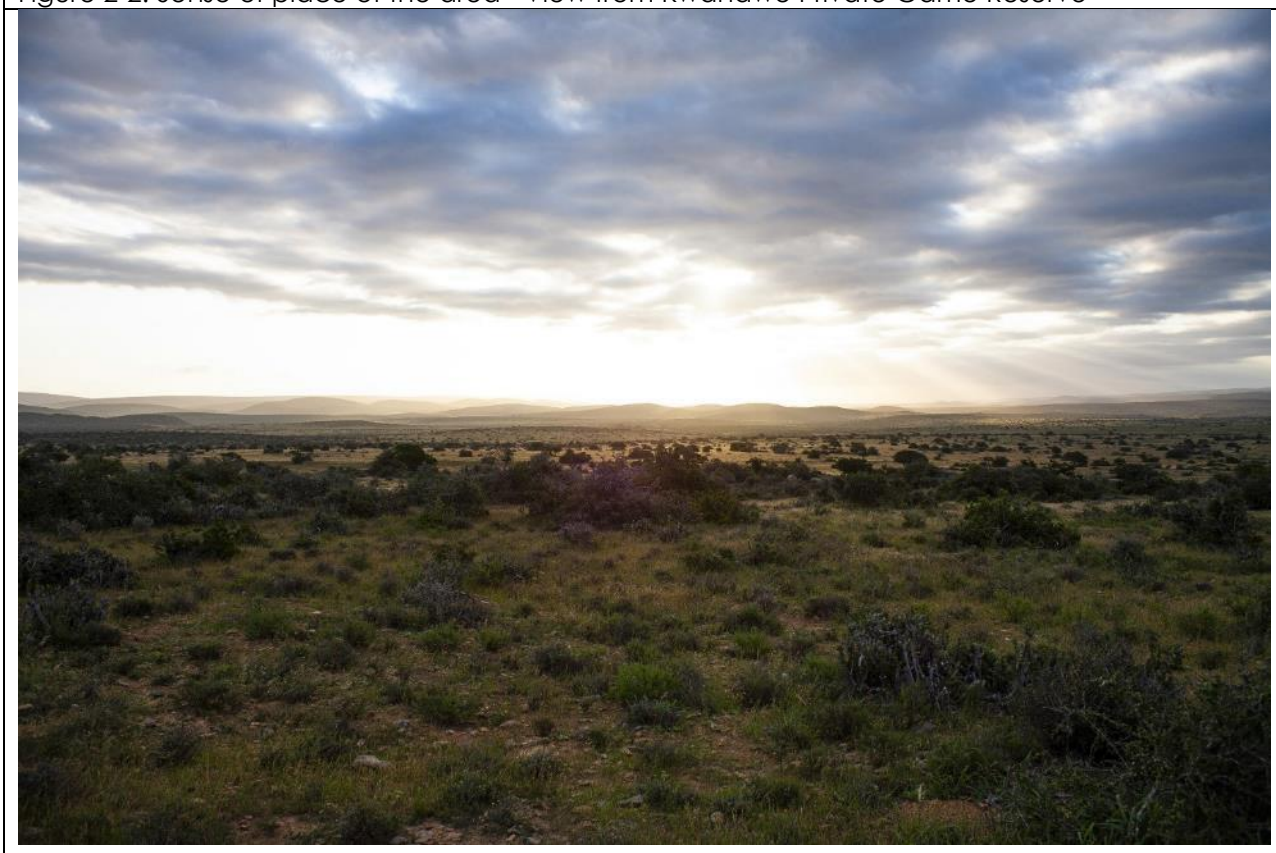

Figure 2-3: Sense of place of the area - View from Kwandwe Private Game Reserve

2.3.2 VIEWERS AND VIEWER SENSITIVITY SITUATION ANALYSIS

Understanding the characteristics of persons who would likely view the actual project is important because it is the human response to visible changes in a landscape that determines whether the changes represent an improvement in scenic attractiveness (a positive visual impact) or a decrease in scenic attractiveness (a negative visual impact), as well as determining the magnitude of the impact.

In case the case of Kwandwe PE, Great Fish PNR and surrounding activities that relies on wilderness experience, large areas that have the highest visitor densities and game viewing and or hunting activities will be exposed to the brunt of the visual impact through conversion of wilderness landscape into and energy landscape is characterized by various elements of the energy chain (including turbines for energy extraction, roads for transport and powerlines for transmission of energy).

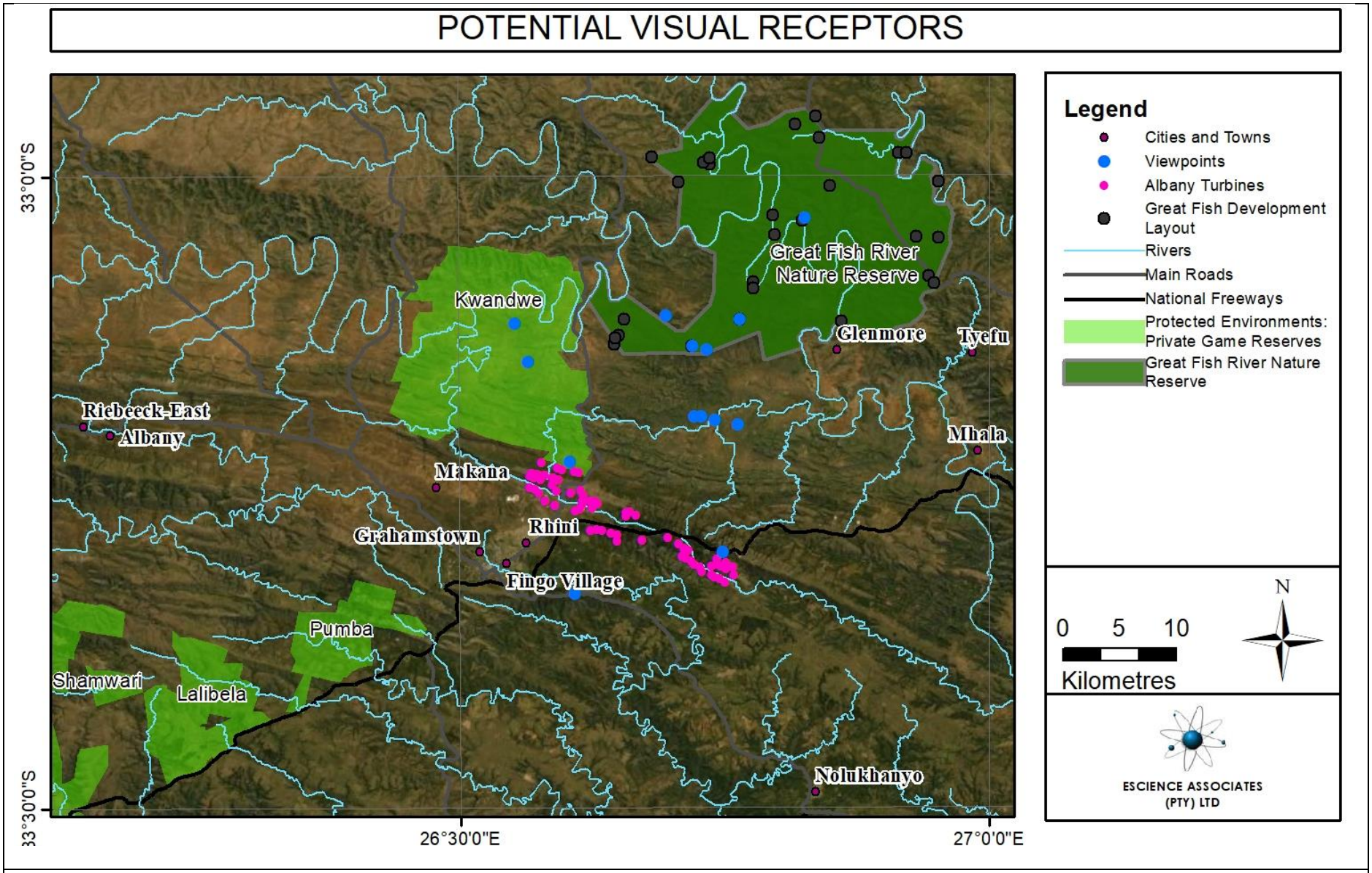

Figure 2-4: Location of proposed WEF in relation to Potential Visual receptors.

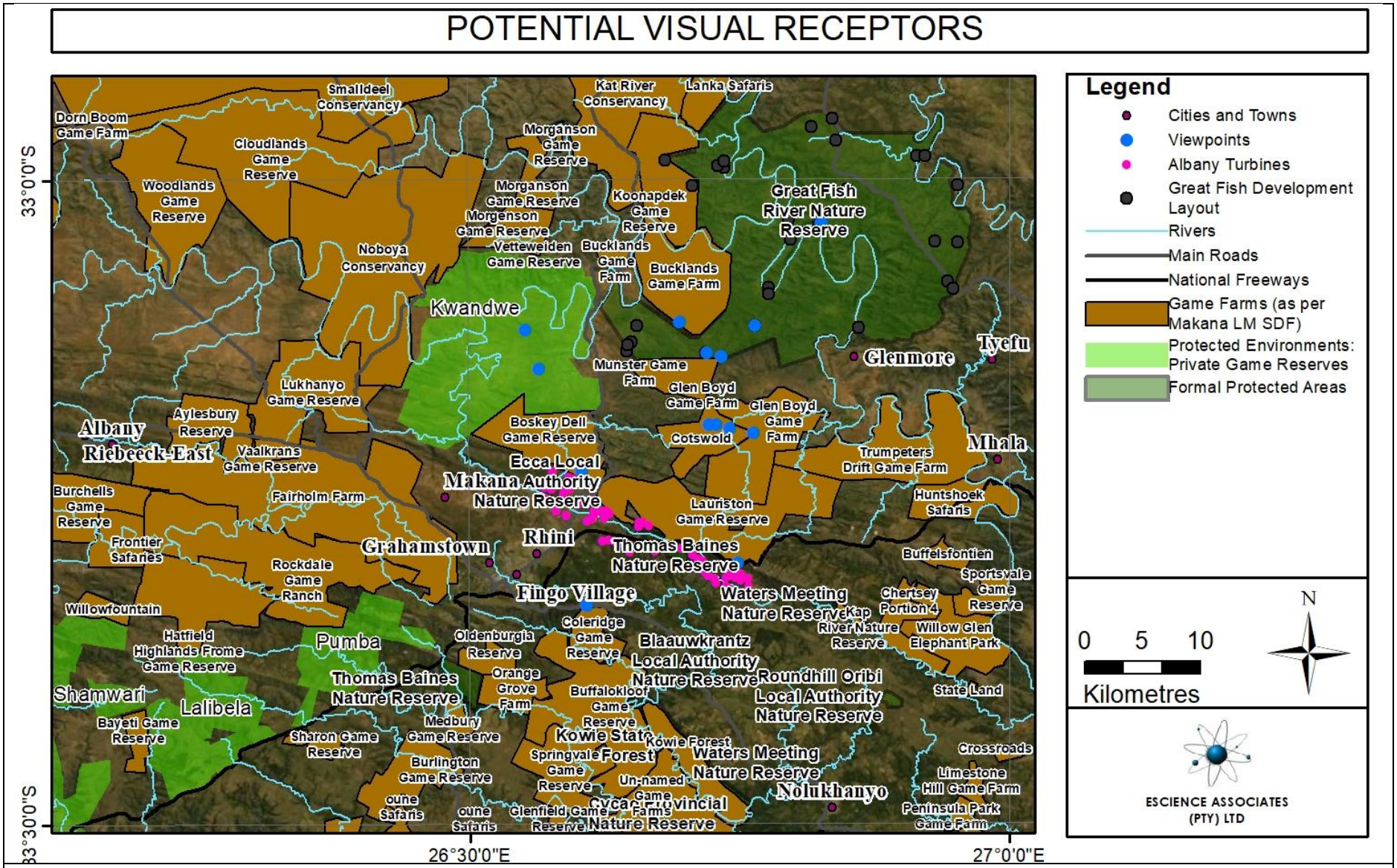

Figure 2-5: Location of proposed WEF in relation to Potential Visual receptors

2.4 EXPECTED LEVEL OF IMPACT/TYPE OF ASSESSMENT

The Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1, by Oberholzer (2005)[5], provides a guide by which the intensity and type of specialist involvement can be determined through the categorisation of a development and the receiving environment.

A WEF is categorised as a Category 5 development by the *Guideline for involving visual & aesthetic specialists in EIA processes* Oberholzer (2005)[5] as shown in Table 2-1. This is derived by cross-referencing the intensity of development with the receiving environment to determine the level of impact associated with the coupling of the development and the receiving environment.

A wind energy development comprised of a large number of turbines covering an expansive area constitutes a Category 5 development whereas the receiving environment in the form of Protected/wild areas of international, national, or regional significance indicates that a Very High Visual Impact can be expected on protected area goods and services.

Table 2-1: Derivative table aiding the determination of the level of specialist involvement and expected impact

TYPE OF ENVIRONMENT	**TYPE OF DEVELOPMENT (LOW TO HIGH INTENSITY)**				
	Category 1 Development	**Category 2 Development**	**Category 3 Development**	**Category 4 Development**	**Category 5 Development**
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	**Very high visual impact expected**
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected

[5] *The Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1*, by Bernard Oberholzer (2005) – https://www.westerncape.gov.za/text/2005/4/deadp_visual_guideline_draft_15april05.pdf

Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected - possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected - Possible benefits	Little or no visual impact expected - Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

The *Guideline for involving visual & aesthetic specialists in EIA processes* by Oberholzer (2005)[6] further states that for developments where a High or Very high visual impact is expected, a Level 4 Visual Assessment should be undertaken. The guideline provides approaches and methods for a Level 4 assessment.

Approach to Visual impact assessment:

- Systematic and methodological Visual Impact Assessment report by independent visual specialist (or team of specialists).
- Review by an independent, experienced visual specialist (if required).

Method and terms of reference for a Level 4 visual impact assessment are as follows:

- Quantify and assess the existing scenic resources through visual characterisation of a site and its viewshed.
- Determine important viewpoints within viewsheds in order to assess the potential visual influence of the proposed project.
- Prepare visual maps, including landscape context, visual constraints, viewpoints, viewsheds and view corridors in relation to the proposed development.
- Undertake 3D modelling and prepare viewshed photomontages of the proposed development.
- Assess the significance of potential visual impacts (direct as well as on the cultural landscape) resulting from the proposed project from various important viewpoints.
- Identify practicable mitigation measures to reduce negative visual impacts and to identify how these can be incorporated into the project design if at all.

[6] *The Guideline for involving visual & aesthetic specialists in EIA processes: Edition 1*, by Bernard Oberholzer (2005) – https://www.westerncape.gov.za/text/2005/4/deadp_visual_guideline_draft_15april05.pdf

3 DATA GATHERING AND ANALYSIS OF RECEIVING ENVIRONMENT

3.1 LANDSCAPE SENSE OF PLACE AND SENSITIVITY

Landscapes in general, and landscapes comprising protected areas and wilderness areas more specifically, contribute substantially to sense of place, and in the case of protected areas, also biodiversity conservation and social wellbeing through nature experience. The biophysical and socio-cultural factors that define landscapes provide what are generally referred to as landscape goods and services (and in protected area context referred to as protected area goods and services).

3.1.1 SENSE OF PLACE

Although many terms have been used to refer to human connections to place, most would probably agree that Sense of Place is the most encompassing term, referring to the entire group of cognitions and affective sentiments held regarding a particular geographic locale.[7,8]

Sense of Place is a complex concept that compounds the range of factors which define the local distinctiveness of a specific place and the ways in which people experience, use and understand that place to the extent that an emotional connection / attachment may be formed with a place; a presence that makes it part of the person and/or community and further a functional dependence because it is needed for conservation, economic or cultural activities (adapted from Zia et al., 2014[9]). It can be stated without a doubt that the area has a distinctive landscape character and quality derived from its geology, vegetation and topography and that it is well appreciated that these landscapes provide some of the most iconic Eastern Cape vistas as reported in literature and tourism marketing material e.g. "Adam's Krantz viewpoint over the twisting Fish river canyon is one of the most iconic Eastern Cape vistas.[10]"

[7] Altman, I., & Low, S. (1992). Place Attachment. Boston, MA: Springer.
[8] Jorgensen, B., & Stedman, R. (2001). Sense of place as an attitude: lakeshore property owners' attitudes toward their properties. Journal of Environmental Psychology 21, 233-248.
[9] Zia, A., Norton, B.G., Metcalf, S.S., Hirsch, P.D., and Hannon, B.M. 2014. Spatial discounting, place attachment, and environmental concern: Toward an ambit-based theory of sense of place. Journal of Environmental Psychology, 40, 283-295.
[10] Eastern Cape Parks & Tourism Agency- Explore Eastern Cape Explore Eastern Cape https://visiteasterncape.co.za/parks/great-fish-river/

Whereas the landscape can currently be described as rural and/or natural and largely of wilderness character, with very high scenic value, due to limited if any intrusion of infrastructure associated with rural land use activities.

Should the WEF be constructed the landscape would become what is defined as an energy landscape:

> "*An energy landscape is characterized by one or more elements of the energy chain (e.g. energy extraction, assimilation, conversion, storage, transport or transmission of energy).*" [2]

The conversion of wilderness landscape into and energy landscape is characterized by various elements of the energy chain (including turbines for energy extraction, roads for transport and powerlines for transmission of energy) and the landscape will be changed from a single layer mosaic vegetation with isolated multilayer effects arising from exposed rock faces, to a multi-layer energy landscape comprising combinations of technical components juxtaposed against natural landscape and creating multilayer effects of turbines, roads and powerlines.

3.1.2 PLACE ATTACHMENT

Place attachment is one of the most employed terms within the realm of Sense of Place studies. According to Williams & Vaske (2003),[11] when used broadly, place attachment is the environmental psychologist's equivalent of the geographer's Sense of Place. As such, it sometimes is used to encompass a whole spectrum of place-related phenomena, including place dependence, place identity, rootedness, and satisfaction.[12] However, this term appears to be used in a narrower way in much recreation and tourism literature. Kyle et al. (2003)[13] captured the essence of place attachment: "the extent to which an individual values or identifies with a particular environmental setting".

[11] Williams, D., & Vaske, J. (2003). The Measurement of Place Attachment: Validity and Generalizability of a Psychometric Approach. Forest Science 49(6), 830-840.
[12] Kaltenborn, B. (1998). Effects of sense of place on responses to environmental impact: a case study among residents in an Arctic community. Applied Geography 18(2), 169–189.
[13] Kyle, G., Graefe, A., Manning, R., & Bacon, J. (2003). An examination of the relationship between leisure activity involvement and place attachment among hikers along the Appalachian Trail. Journal of Leisure Research 35(3), 249–273.

In this respect place attachment is important in the tourism industry, as place attachment necessarily involves emotion and destination identity, as well as sense of belonging could affect tourist revisit behaviour. [14] Naturally if landscape identity is drastically altered the emotional memory component of place attachment may be remain but the emotion to attach with the place again (to visit the place) may very well be lost as the identity of the place as it was known and longed for has been lost.

Researchers are increasingly acknowledging the value of the less quantifiable and less tangible advantages that individuals get from nature and places such as protected areas (Douglas etal 2018[15], Barendse et al. 2016), for example the recreational, spiritual, experiential and educational exchanges with nature that add to the well-being of a human (Millennium Ecosystem Assessment 2005). More importantly, the extent to which one appreciates such benefits is often dependent on one's ability to engage with or form an association with the natural environment (Hinds & Sparks 2008). Ramkissoon, Smith and Weiler (2013b) noted the connectedness to nature (Gosling & Williams 2010).

Social scientists are beginning to argue that Sense of Place should be taken more seriously in risk analysis (Jacquet and Stedman, 2014[16]) because it often indicates strong opposition to land use change and the likelihood of social disruption if the development proceeds. Change in sense of place may disturb not only the economic dependence of people on a place but also their emotional attachment and identity and specific consideration should be afforded to Kwandwe PE, Great Fish PNR and wilderness area visitors and more so regular visitors and their emotional attachment to these wilderness areas and its sense of place.

[14] Farnum, Jennifer & Kruger, Linda. (2005). Sense of Place In Natural Resource Recreation and Tourism: An Evaluation and Assessment of Research Findings. USDA Forest Service - General Technical Report PNW. https://www.fs.fed.us/pnw/pubs/pnw_gtr660.pdf

[15] Douglas, A., Wessels, J., Pope, J., Morrison-Saunders, A., & Hughes, M. (2019). Measuring Kruger visitors' place attachment to specific camps. Koedoe, 61(1), 11 pages. https://doi.org/10.4102/koedoe.v61i1.1559

[16] Jacquet, J. B., and Stedman, R.C. 2014. The risk of social-psychological disruption as an impact of energy development and environmental change. Journal of Environmental Planning and Management, 57(9), 1285-13.

3.1.3 SENSE OF PLACE AS TOURISM PRODUCTION FACTOR

Tourism output can be described as a function of land, capital / labour and resource stock production factor inputs, where a value chain develops along the following lines (Marcouiller 1998[17]):

➔ Primary inputs (Land)

➔ Intermediate input (Parks, resorts, roads)

➔ Intermediate outputs (Park interaction and interpretation)

➔ Final outputs (recreation, memories)

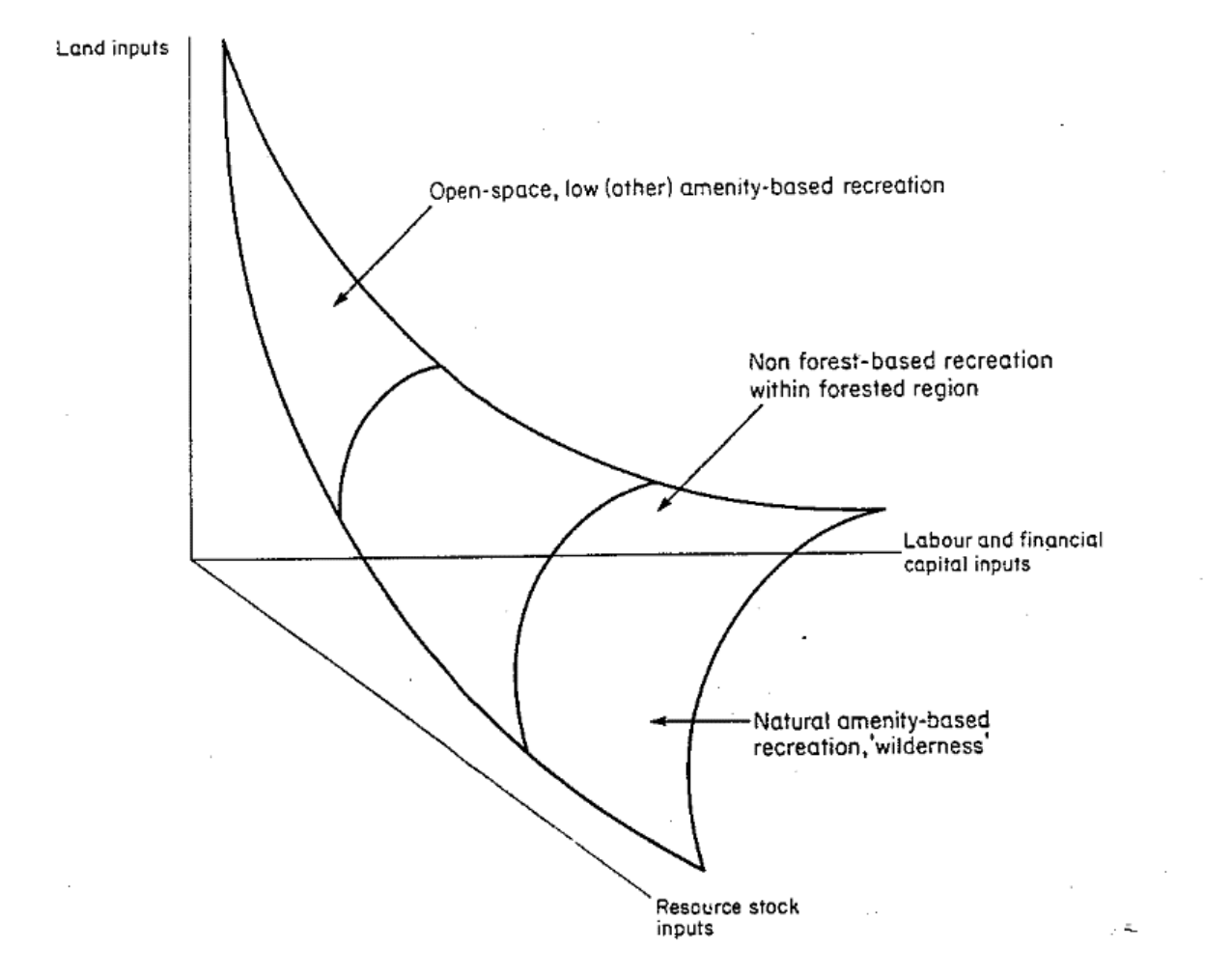

Figure 3-1: Tourism output as a function of land, capital / labour and resource stock

[17] Marcouiller, D. W. (1998). Environmental Resources as Latent Primary Factors of Production in Tourism: The Case of Forest-Based Commercial Recreation. Tourism Economics, 4(2), 131–145.

Environmental resources are thus the primary drivers of tourism, and landscape has an important contribution to protected area tourism in general, and specifically in terms of wildlife and nature tourism.

It may be noted that:

- the more expansive (and undegraded) land input is, the more expansive the tourism experience and the more valuable the tourism resource,
- the more resource inputs in the form of biodiversity, variety of wildlife, and scenic quality of landscapes, the more the more diverse the tourism experience and the more valuable the tourism resource,
- the more labour and financial input is available (in form of access infrastructure and guidance), the more intensive the tourism experience.

The proposed Albany WEF will constrain both land and landscape diversity, and have a significant impact on the surrounding protected area goods and services offering, as well as tourism value.

3.1.4 LANDSCAPE SENSITIVITY – SENSITIVITY IN CONTEXT OF VISUAL LANDSCAPE

Landscape sensitivity may be regarded as a measure of the resilience, or robustness, of a landscape to withstand specified change arising from development types or land management practices, without significant or undue negative effects on the landscape visual baseline and their value – such as changes to valued attributes of baseline landscape character and the visual resource.

Sensitivity in the context of landscape is a term applied to specific receptors, combining judgements of the susceptibility of the receptor to 1) the specific type of change, 2) degree of alteration or 4) type development proposed, and the value of landscape and landscape character related to that receptor.[18]

Landscape capacity refers to the degree to which a particular landscape character type or area has the ability to accommodate change without significant effects on its character,

[18] Landscape Institute; Institute of Environmental Management & Assessment . (2013). Guidelines for Landscape and Visual Impact Assessment, third edition. Routledge.

or overall change of landscape character type. Capacity varies according to the landscape character and type and nature of change being proposed.[19]

- Landscape sensitivity may be regarded as a measure of the resilience, or robustness, of a landscape to withstand specified change arising from development types or land management practices, without undue negative effects on the landscape and visual baseline and their value – such as changes to valued attributes of baseline landscape character and the visual resource.
- Landscape capacity is related to landscape sensitivity to the extent that it has capacity for resilience to change, or robustness, and ability to withstand specified change arising from different development types or land management practices.

Landscape sensitivity assessment of protected areas to assesses the resilience / robustness of landscape character and the visual resource – and what visitors to the protected area and wilderness area value.

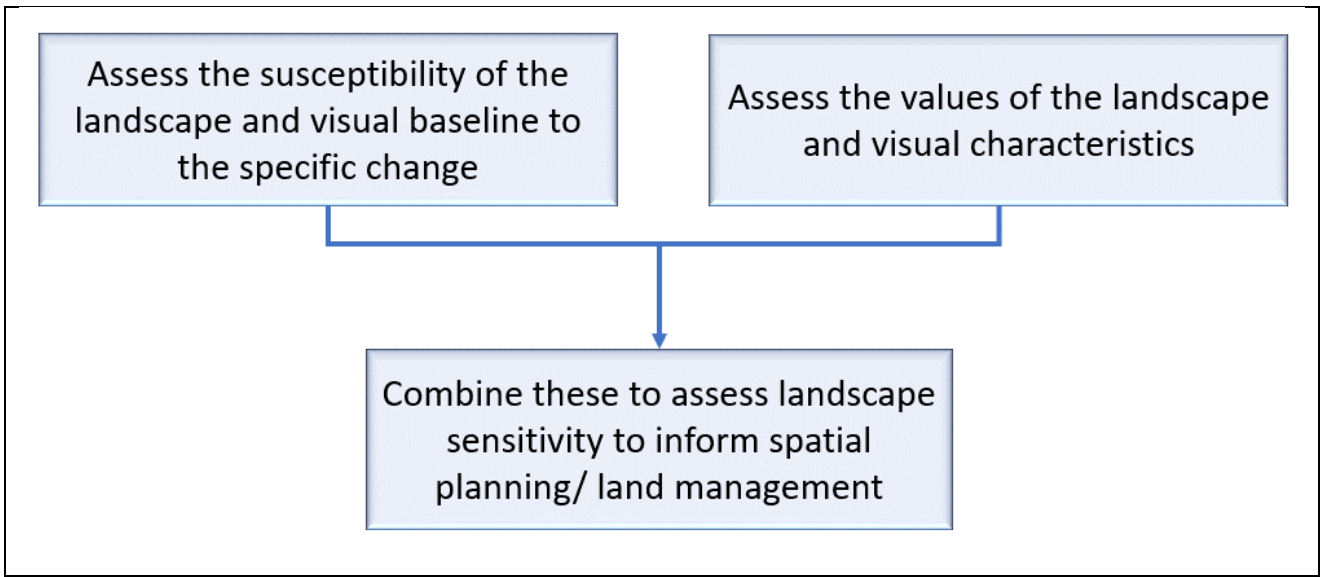

Figure 3-5: Assessing landscape sensitivity

3.1.5 Albany Receiving Environment Landscape Sensitivity

Landscape sensitivity was determined as part of this study through the identification of natural, scenic and cultural resources which have aesthetic and economic value to the local community, the region, and society as a whole:

[19] Marot, N., & Kruse, A. (2018). Towards common terminology on energy landscapes. Journal of Landscape Ecology: Special Issue 2, 59-63.

- The resources considered include features of topographic, geological or cultural interest, together with landscape grain or complexity.
- Protected landscapes, such as national parks, nature reserves, game parks or game farms, as well as heritage sites, add to the cultural value of an area and were thus considered as essential criteria in the determination of landscape sensitivities.
- Unique Sense of Place arising from diversity of natural vistas scenery, land- and seascapes.

When the receiving environment is considered, not just the land where the turbines are to be constructed should be taken into account, but also the surrounding area, with particular emphasis on national parks, protected areas, heritage sites, and other sites of historical or conservation importance. Due to the proximity to numerous protected areas and game farms, the landscape of the study area can only be described as having a very high or pristine scenic value.

A portion of the proposed Albany wind farm is situated within the Cookhouse Renewable Energy Development Zone (REDZ). Part of the Strategic Environmental Assessment (SEA) for Wind And Solar Photovoltaic Energy In South Africa conducted by CSIR in 2015, was a landscape (visual) sensitivity assessment. Figure 3-2 shows that the areas of the cookhouse REDZ in which the WEF is proposed are acknowledged as mostly 'very high' and 'high' visual sensitivity and therefore not ideally suitable for wind farm development.

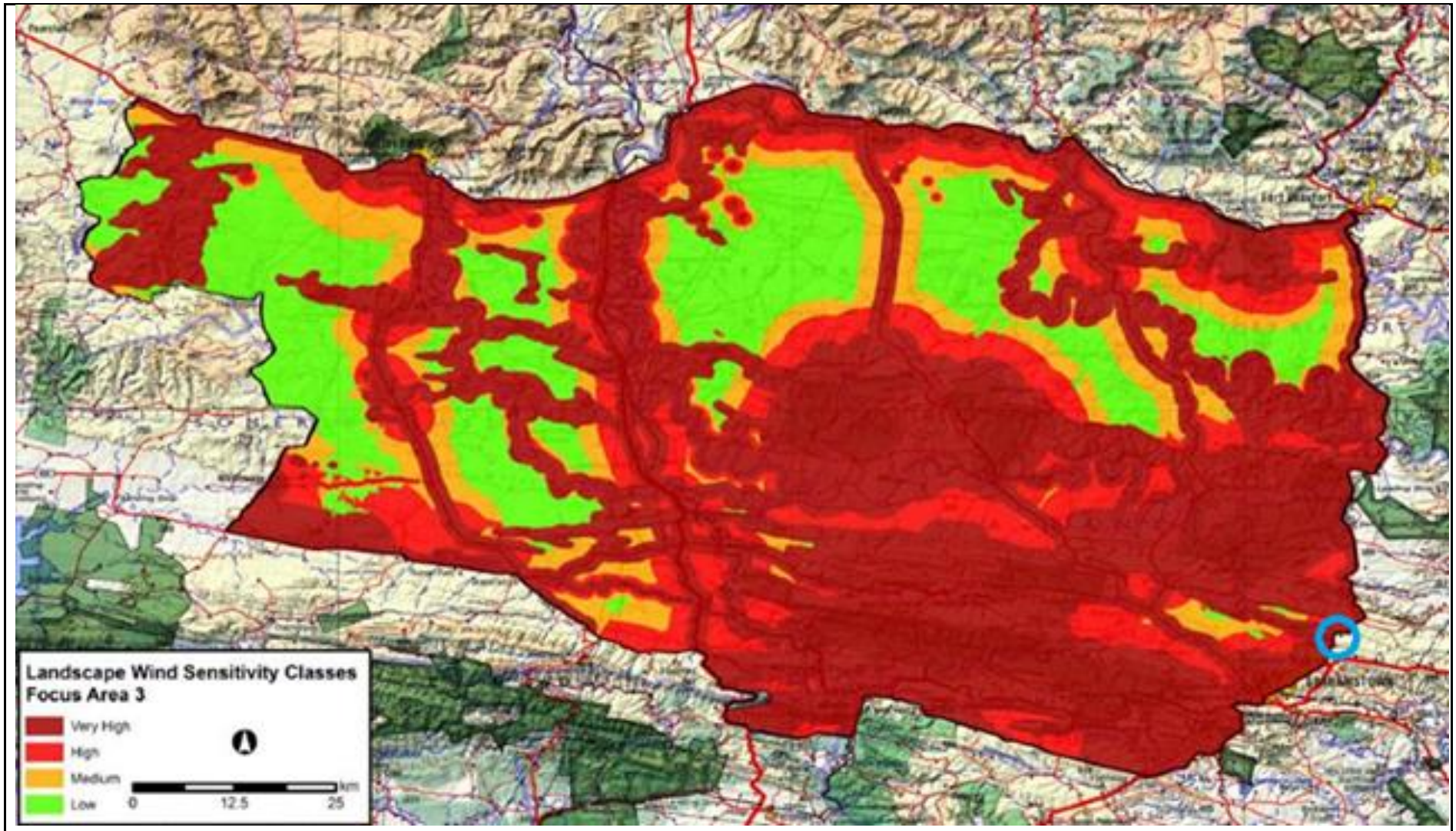

Figure 3-2: Landscape sensitivity map for wind development in the cookhouse REDZ Focus Area with the proposed Albany WEF located in the blue circle

MAP OF RELATIVE LANDSCAPE (WIND) THEME SENSITIVITY

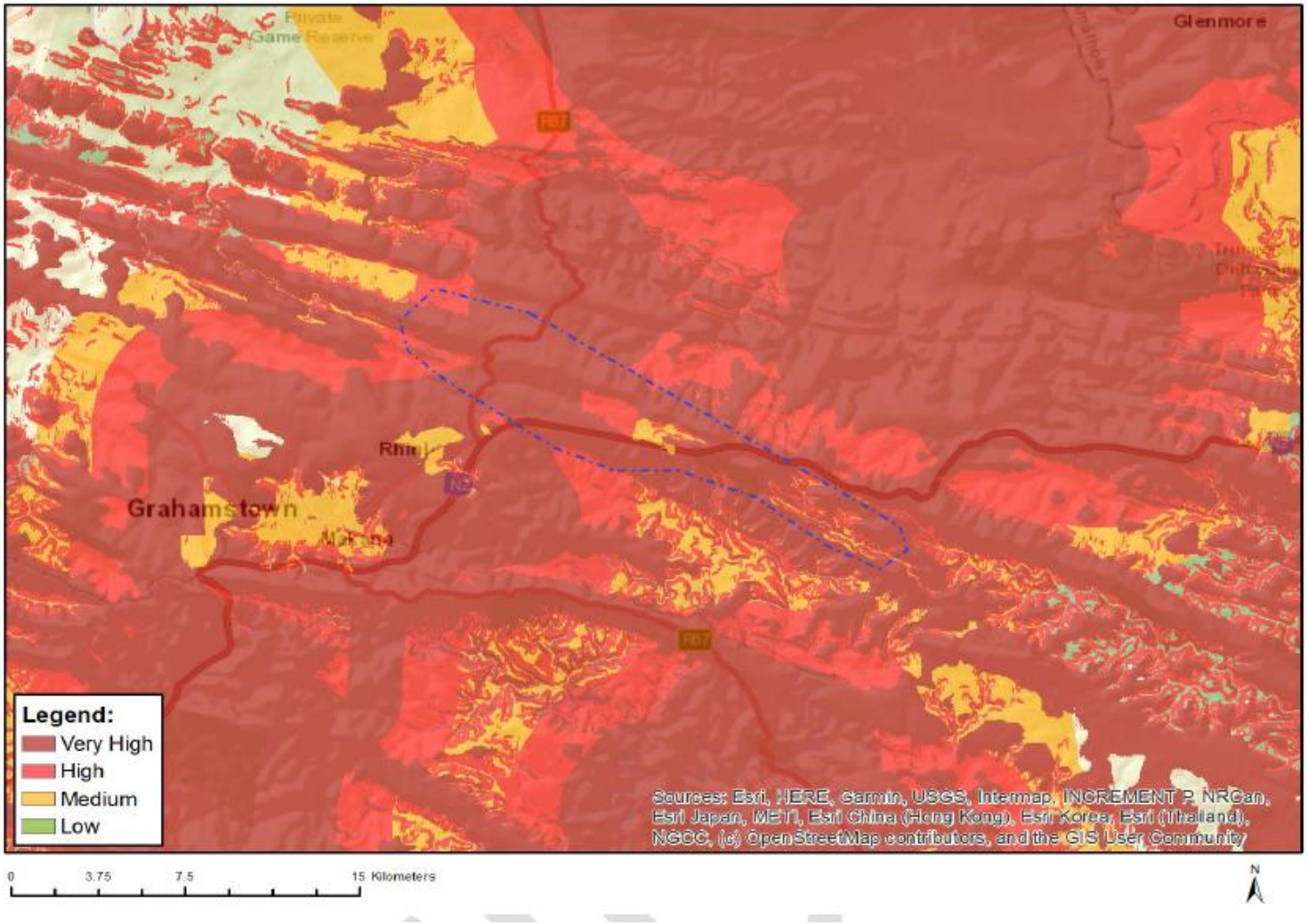

Figure 3-3: Landscape sensitivity map for wind development as specified by the DFFE online Screening Tool with the proposed Albany WEF located in the blue circle

The Landscape Sensitivity as shown in Figure 3-2 is based on recommended visual buffers, derived from the Wind and Solar SEA (CSIR, 2015), as indicated in Table 3-1.

Table 3-1: Visual sensitivity categories with recommended visual buffers CSIR, 2015

Scenic Resources/ Sensitive receptors	**Very High Sensitivity (No-go areas)**	**High visual sensitivity**	**Medium visual sensitivity**
Topographic features, ridges, scarps	Identified Features	0-250m	-
Steep slopes	Slopes > 1:4	Slopes > 1:10	-
Water features, wetlands, dams	0-250m	250-500mm	-
Heritage sites Grade I and II	Feature	0-500m	500m-1km
Heritage sites Grade III	Feature	0-250m	250-500m
Nature Reserves	0-3km	3-5km	5-10km
Private reserves/ guest farms	0-1,5km	1,5-3km	3-5km
Game farms (site boundary)	0-1km	1-2km	2-3km
Farmsteads outside the site	0-500m	500m-1km	1-2km
Settlements / towns	0-2km	2-4km	4-6km
Provincial / arterial route	0-500m	500m-1km	1-3km
Scenic routes	0-1km	1-2,5km	2,5-5km
National road	0-1km	1-2,5km	2,5-5km
Small airfields	0-3km	-	-
Farm boundary setback	1,5x turbine height [1]		

[1] *Relates to both safety and visual considerations*

A number of the proposed turbines fall within very high sensitivity areas.

The Wind and Solar SEA (CSIR, 2015) indicates that:

> *Very high sensitivity areas are potentially unsuited for large scale development owing to their aesthetic or scenic values. These landscapes contain visually sensitive or scenically valuable resources which include skyline ridges and other prominent topographic features. These landscapes may also be very sensitive due to their close proximity to protected areas (national parks, nature reserves, botanical or biosphere reserves and private reserves), game farms, cultural landscapes, heritage sites, settlements, scenic routes, tourism facilities and/or other sensitive receptors.*
>
> *Proponents intending to develop a wind of solar PV facility that triggers an environmental impact assessment process in very high sensitivity areas inside adopted REDZs must prove to the relevant competent authority that the proposed development will not have an unacceptable negative impact on sensitive local and/or regional aesthetic and scenic values. In order to do so, a comprehensive Visual Impact Assessment (VIA), integrated into a wider Heritage Impact Assessment (HIA), undertaken by a competent visual specialist, and in accordance with NEMA regulations pertaining to specialist reports and impact assessment, is required. Such a study must be submitted to the relevant heritage authority for comment. Such comment, if provided within stipulated timeframes, will be considered by the relevant competent authority for decision making.*
>
> *In addition to the NEMA requirements the VIA must include:*
>
> - *project footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on a sensitivity map prepared in accordance with the sensitivity criteria set out in this study;*
> - *calculations of development densities considering all surrounding projects that applied for environmental authorisation prior to the project currently under investigation, and comparison thereof with the limits set out in this study;*
> - *a clear and justified opinion statement by the specialist recommending whether the project should from a landscape perspective receive approval. If this statement is subject to any conditions these must also be clearly stated; and*

- *where applicable, proposed mitigation measures for inclusion in the Environmental Management Programme (EMPr).*

3.1.6 RECEIVING ENVIRONMENT LANDSCAPE FUNCTION

Landscape Function is defined as:

The flows of social, economic and ecological benefits that land may generate. In the context of Ecosystem Services, this can be described as the capacity of land for ecosystem service production.[2]

The landscape function of the affected areas includes the provision of protected area goods and services.

3.1.7 RELEVANT LEGISLATION, REGULATION AND PRACTICE

Sense of Place is not directly addressed in South Africa. However, the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended), along with the National Heritage Resources Act (NHRA) (Act 25 of 1999), does create a framework which allows Sense of Place to be addressed:

- Section 2 (principles) of NEMA, *inter alia*, states that "sustainable development requires the consideration of all relevant factors including … that the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied".
- Section 2 (principles) of NEMA, *inter alia*, states that "sustainable development requires the consideration of all relevant factors including…that decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge".
- Section 24(4) of NEMA, *inter alia*, states that "procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment … must include, with respect to every application for an environmental authorisation and where applicable … investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any National Estate referred to in Section 3(2) of the National Heritage Resources Act (NHRA), 1999 (Act No. 25 of 1999)".

Landscapes with cultural significance do not have a dedicated section in the NHRA but they are protected under the definition of the National Estate (Section 3). Section 3 (2)(c) and (d) list "historical settlements and townscapes and landscapes and natural features of cultural significance" as part of the National Estate. Furthermore, Section 3(3) of the NHRA describes the reasons a place or object may have cultural heritage values; some of these speak directly to the cultural landscapes. In terms of Section 2(vi) of the NHRA, "cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

It could therefore be argued that current (EIA and development planning) practices, rather than the regulatory framework, are inadequate in addressing Sense of Place issues.

3.2 SENSITIVE RECEPTORS AND ZONE OF VISUAL INFLUENCE

Empirical research now available on wind farm visual impact shows a consistent and essentially linear relationship between turbine height, distance and wind farm visual impact. For any degree of visual impact (such as the zone of visual influence, or threshold for visual dominance), if turbine height is doubled, the distance threshold for that degree of impact also typically doubles.

There are many views and opinions about distances within which wind farm visual impact should be assessed, some of which has been set out in guidelines and locally adopted (e.g. REDZ SEA Landscape Assessment which suggests that wind turbines of between 100 – 150 m are regarded as visible at distances of up to 50 km, and single turbines of up to 50 m are visible at smaller distances.

3.2.1 ZONE OF VISUAL INFLUENCE

There are theoretical positions which are not always well considered. Principally, that with increasing hub height and rotor diameter, turbines are both more visible and visible over longer distances. In this respect there are however several research studies that have been published which can be used to form sound opinions and inform best practise.

A study by the University of Newcastle (2002)[20] commissioned by Scottish Natural Heritage (based on their assessment of eight wind farms) recommended a height-distance relationship for Zone of Visual Influence (ZVI)as shown in the following table (with increased heights relevant to the Albany WEF VIA added by extrapolation).

Height of turbines (total including rotors) (m)	Recommended ZVI distance (km)
50	15
70	20
85	25
100	30
200	60 (by extrapolation)

3.2.2 Foci Of Visual Attention And Radius For Visual Impact

A study by the Argonne National Laboratory for US Department of Energy Bureau of Land Management (BLM)[21] in 2012 gave a report on visual impact of wind and guidance on visibility. The study was a systematic examination of the visual impact of five existing wind farms in Wyoming and Colorado, with turbines 90 – 120 m in tip height and most of them close to 120m (thus just more than half of proposed WEF at 200m) and It was found that:

- "Under favourable viewing conditions, the wind facilities were judged to be major foci of visual attention at up to 19 km and likely to be noticed by casual observers at >37 km".
- "A conservative interpretation suggests that for such facilities, an appropriate radius for visual impact analyses would be 48 km, that the facilities would be unlikely to be missed by casual observers at up to 32 km…the facilities could be major sources of visual contrast at up to 16 km."

The study further classified situations rated 5 or 6 as being of high impact and, on that basis, specified a *Limit of visual pre-eminence* which was 16 kms for turbines 120 m high such that:

[20] University of Newcastle. 2002. Visual Assessment of Windfarms Best Practice. Scottish Natural Heritage Commissioned Report F01AA303A

[21] Sullivan, Robert G., et. al., 2012. Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes. Argonne National Laboratory and the U.S. Department of the Interior, Bureau of Land Management. USA [BLM Study].

- "At this distance, the wind facility is a major focus of visual attention, drawing and holding visual attention ... The facility as a whole is likely to be perceived by some viewers as having a large visual impact."

3.2.3 NATURE OF VIEWER TYPES EXPOSED TO THE DEVELOPMENT

The types of viewers potentially exposed to the development will be varied and include commuters and residents, but most notably will include both local and international tourists visiting the game farms and nature reserves and using the arterial roads to access tourist attractions in the area.

Because of the mix of land uses including ecotourism, as well as wildlife and nature tourism, the visual impact of proposed development is anticipated to be very high.

3.2.4 POTENTIAL VISUAL EXPOSURE

- The wind turbine structures are not only of excessive height but also substantial in number, thus various receptors located over a wide area will suffer significant exposure to the development.
- For present purposes of the Albany WEF, viewshed protection is of special importance due to the possible negative effect on tourism of the development due to the impact on vistas within these game farms and nature reserves, *which define their unique and memorable character and its Sense of Place*.
- Tourists visiting these game farms and nature reserves whose attitudes may range between being positively inclined to very adverse to visual change in the area will be impacted as the development will impact the Sense of Place of the game farms and nature reserves, their goods and service offering, and the tourist experience.

3.2.5 PROTECTED AREA BUFFER ZONES

In terms of the GN 382 Norms and Standards for Protected Areas in South Africa[22] protected and in terms of Regulation 9 Planning outside the boundary to secure the protected area, protected areas should have determined a buffer zone and is involved structures to ensure

[22] Norms and Standards for Protected Areas in South Africa. GN 382 in GG 39878 of 31 March 2016

integrity of the protected area as a norm and it is a standard requirement that an appropriate buffer zone for the protected area is to be established.

3.3 CONSIDERATION OF GUIDELINES

3.3.1 THE ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINE FOR RENEWABLE PROJECTS

The then Department of Environmental Affairs, in 2015, published the EIA Guideline for Renewable Energy Projects[23], in order to assist project planning, financing, permitting, and implementation for both developers and regulators in the Independent Power Producer (IPP) procurement programme in South Africa.

With respect to biodiversity protection and management the guideline indicates that:

> *Chapter 3 of the NEMBA* [National Environmental Management Biodiversity Act (No. 10 of 2004)] *provides an overview on Biodiversity Planning and Monitoring; provides for the preparation and adoption of the National Biodiversity Framework, the determination of bioregions and the publication of bioregional plans. The NEMBA also enables the adoption, coordination and alignment of biodiversity plans and biodiversity management agreements, amongst others. Any existing statutory instruments for biodiversity protection and management which may have been adopted in terms of this chapter must be taken into account during the implementation of any development activities as well as during assessments for authorisations in terms of additional legislation such as, for instance, environmental authorisations in terms of the NEMA*.

The guideline lists the objectives of the National Environmental Management: Protected Areas Act 2003 (Act 57 OF 2003) (NEMPAA) as amended, most pertinent of which in this context is:

> "*to promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas;*"

23 Department of Environmental Affairs (2015). EIA Guideline for Renewable Energy Projects. Department of Environmental Affairs, Pretoria, South Africa

3.3.2 WORLD BANK GROUP ENVIRONMENTAL, HEALTH AND SAFETY ("EHS") GUIDELINES FOR WIND ENERGY

World Bank Group Environmental, Health and Safety ("EHS") Guidelines for Wind Energy (August 2015)[24] provides a useful guideline for the application of best environmental practice to the WEF. Section 1.1.1 of the World Bank EHS Guidelines addresses the impacts of the wind farm on "Landscapes, Seascapes and Visual Impacts".

Note 12 addresses the WEF impact, "*on Legally Protected and Internationally Recognised Areas of Importance to biodiversity and cultural heritage...*"

Note 13 advocates that *"…avoidance and minimization measures to address landscape… and visual impacts are largely associated with the siting and layout of wind turbines and associated infrastructure…"* Given the siting of the WEF near these game farms and nature reserves, the WEF will be intrusive on the sensitive landscape that form the basis for wildlife and nature tourism of these areas. The avoidance of impact through placement of the WEF elsewhere at another location i.e. the no-go option, must be considered by the competent authority.

3.3.3 GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

The Western Cape Department of Environmental Affairs and Development Planning developed a series of specialist study guidelines for the EIA process in 2005. The purpose of this series of guidelines was to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. One of the guidelines developed was the "*Guideline For Involving Visual And Aesthetic Specialists In EIA Processes*" which indicates that "the specialist undertaking the VIA should be aware of the following principles and concepts underpinning visual input:

- An awareness that 'visual' implies the full range of visual, aesthetic, cultural and spiritual aspects of the environment that contribute to the area's Sense of Place.

[24] World Bank Group Environmental, Health and Safety Guidelines for Wind Energy (August 2015): https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_policy_ehs-wind_energy.

- The consideration of both the natural and the cultural landscape, and their inter-relatedness.
- The identification of all scenic resources, protected areas and sites of special interest, together with their relative importance in the region.
- An understanding of the landscape processes, including geological, vegetation and settlement patterns, which give the landscape its particular character or scenic attributes.
- The need to include both quantitative criteria, such as 'visibility', and qualitative criteria, such as landscape or townscape 'character'.
- The need to include visual input as an integral part of the project planning and design process, so that the findings and recommended mitigation measures can inform the final design and quality of the project.
- The need to determine the value of visual/aesthetic resources through public involvement.

4 IMPACT ASSESSMENT

4.1 VIEW SIMULATIONS

View simulations showing day an night-time views from three vantage points are shown, chosen from a variety of distances from the developments, and at a range of elevations, in order to illustrate how developments with such prominence in the scene will be visible, not only in clearings, but also intermittently, despite the visual absorption capacity of thick shrubland. These vantage points were selected due to the importance of these locations both for sense of place and for the eco-tourism industry and to demonstrate that the visual impacts on wildlife and nature tourism hotspots are not to be trivialised as they pose potentially fatal threats to wildlife and nature tourism in the area.

The selected vantage points are:

1. Figure 4-1: View simulation showing the daytime view from Adam's Krantz after development
2. Figure 4-2: View simulation showing the night-time view Adam's Krantz after development
3. Figure 4-3: View simulation showing the daytime view from Great Fish Provincial Nature Reserve (Research Station) after development.
4. Figure 4-4: View simulation showing the night-time view from Great Fish Provincial Nature Reserve (Research Station) after development.
5. Figure 4-5: View simulation showing the daytime view from Kwandwe PGR after development.
6. Figure 4-6: View simulation showing the night-time view from Kwandwe PGR after development.

For further view simulations refer to Annexure B.

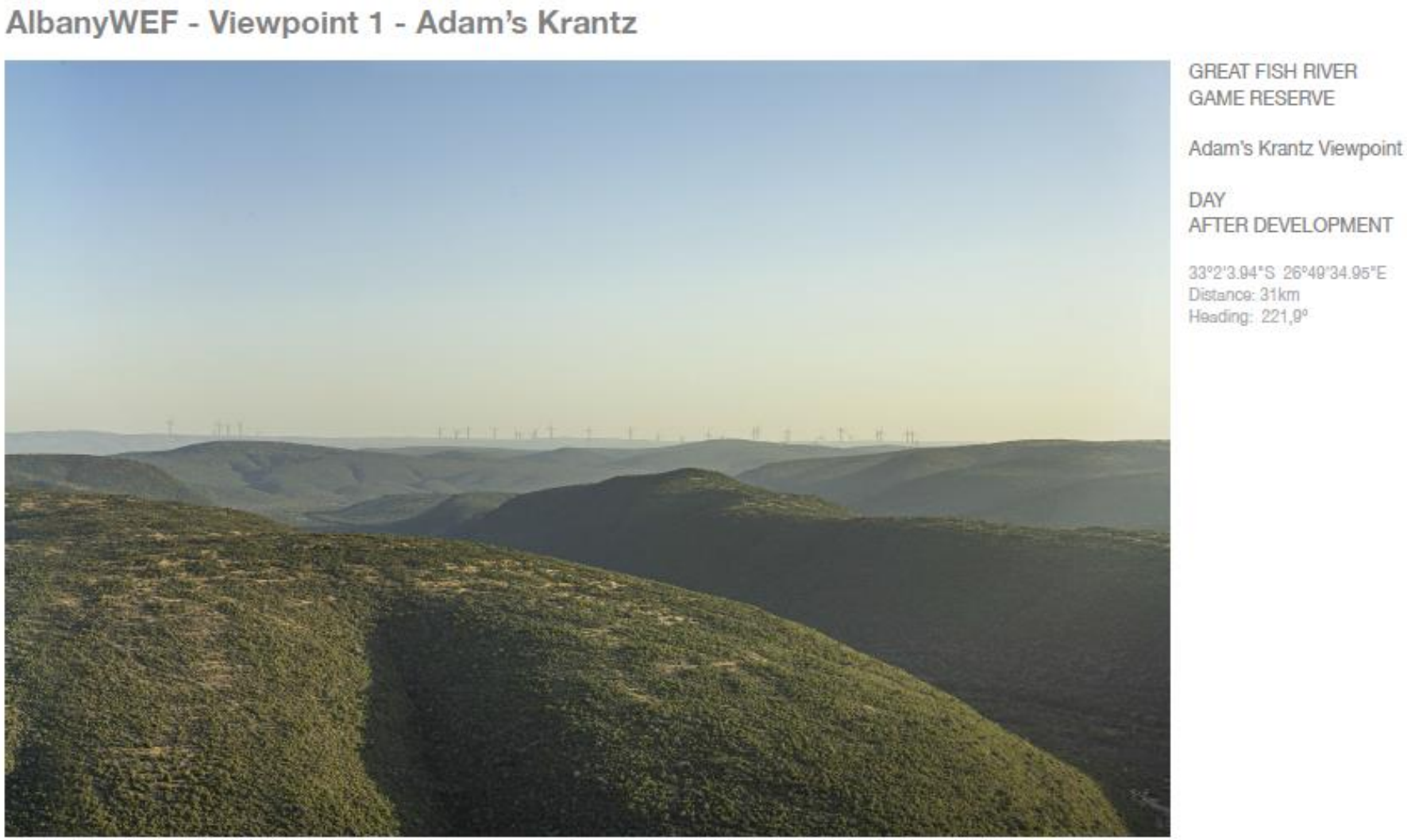

Figure 4-1: View simulation showing the daytime view from Adam's Krantz after development

AlbanyWEF - Viewpoint 1 - Adam's Krantz

GREAT FISH PROVINCIAL NATURE RESERVE

Adam's Krantz Viewpoint

TWILIGHT
AFTER DEVELOPMENT

33°2'3.94"S 26°49'34.95"E
Distance: 31km
Heading: 221,9°

Figure 4-2: View simulation showing the night-time view Adam's Krantz after development

Figure 4-3: View simulation showing the daytime view from Great Fish Provincial Nature Reserve (Research Station) after development

AlbanyWEF - Viewpoint 2

GREAT FISH PROVINCIAL NATURE RESERVE

Research Station/Recreational

TWILIGHT
AFTER DEVELOPMENT

33°08'09.4"S 26°43'13.6"E

Figure 4-4: View simulation showing the night-time view from Great Fish Provincial Nature Reserve (Research Station) after development

AlbanyWEF - Viewpoint 5 (Kwandwe Protected Environment)

DAY
AFTER DEVELOPMENT

33° 7'2.69"S 26°33'11.70"E
Distance: 13.5km
Heading: 170°

Figure 4-5: View simulation showing the daytime view from Kwandwe PGR after development

AlbanyWEF - Viewpoint 5 (Kwandwe Protected Environment)

NIGHT
AFTER DEVELOPMENT

33° 7'2.69"S 26°33'11.70"E
Distance: 13.5km
Heading: 170°

Figure 4-6: View simulation showing the night-time view from Kwandwe PGR after development

4.2 TYPES OF VIEWERS EXPOSED TO THE DEVELOPMENT

Visual sensitivity will vary with the type of users. Recreational sightseers who visit the game farms and nature reserves will be highly sensitive to any changes in visual quality. Since these are places of natural beauty and intense visitor interest, it is inferred that the predominant type of viewers will at best be neutral and more likely to be negatively inclined toward visual impact to the viewsheds.

4.3 DEFINING VISUAL IMPACT ASSESSMENT CRITERIA

4.3.1 VISUAL EXPOSURE

Visual exposure constitutes the visual range of the development, or the geographic area from which the project will be visible.

- **High visual exposure** – covers a large area (e.g., several square kilometres)
- Moderate visual exposure – covers an intermediate area (e.g., several hectares)
- Low visual exposure – covers a small area around the project site.

The proposed development would cover a large area, and the developments themselves will consist of a great number of structures of very large size, resulting in visual exposure to the development from distances in excess of 30 km.

The development is therefore anticipated to have **very high visual exposure.**

4.3.2 RELATIVE VISIBILITY OF THE PROPOSED DEVELOPMENT

Proximity, as well as the physical size of the development, will play a role in its perceivable size from sensitive receptors. The relative perceivable size of the development can be determined by the percentage it will constitute in human field of vision during a static gaze. Using a single-lens reflex (SLR) camera, it can be simulated at a lens angle of between 50 mm and 60 mm, not including peripheral view.

Sullivan et al. (2012) finds that the dynamic aspect of wind turbine blade motion contributed significantly to visual prominence of wind turbines at distances of up 24 km.[25] Others have identified wind turbine blade as a significant attractor of visual attention and a factor that increases perceived visual contrast from WEFs.[26]

It is well understood that humans judge distance to objects in the landscape in part by assessing the effects of atmospheric perspective, the decrease in contrast between an object and its background as distance increases. As distance increases, the colours of the object become less distinct and shift toward the background colour, usually blue or grey. Atmospheric perspective is an important cue for an observer to determine relative distance of objects in the landscape. The loss of sharpness and lower contrast of photographs relative to *in-situ* viewing may exaggerate the effects of atmospheric perspective, thus affecting the perception of scale and distance to objects in the landscape, making them appear farther away than they actually are.[27]

Landscapes are subdivided into 3-distanced zones based on relative visibility from sensitive vantage points. The three zones are:

Foreground-middle ground:

This zone includes areas that are less than 5 - 8 km away, where activities might be viewed in detail. The outer boundary of this distance zone is defined as the point where the texture and form of individual plants are no longer apparent in the landscape. In some areas, atmospheric conditions can reduce visibility and shorten this distance.

Background:

Areas beyond the foreground-middle ground zone, but usually less than 24 km away are in the background zone.

Seldom-Seen:

25 Robert Gerald Sullivan et al, 2012. Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes; Conference: National Association of Environmental Professionals, 37th Annual Conference, Portland, OR

26 Ian D. Bishop and David R. Miller. Renewable Energy, 2007, vol. 32, issue 5, 814-831.

27 Palmer & Sullivan 2020.

Areas beyond the reach of the foreground-middle ground- and background zones fall within the seldom-seen zone.

4.3.3 A DEVELOPMENT'S COMPATIBILITY OR CONTRAST WITH THE ENVIRONMENT

The contrast ratio of the development in relation to its environment can be calculated by means of the following parameters employed in determining compositional Gestalt:

i.) What is the development's height in relation with its environment?

(the height of the installation in relation to the landform of the environment acts upon its contrast ratio).

Higher than landform/vegetation (3) Medium height (2) Low (1)

ii.) What are the predominant shapes involved in the development?

(It is argued that the more geometric the shapes, the more man-made the development will appear).

Geometric shapes (3) Combination of shapes (2) Organic shapes (1)

iii.) Colour:

(A colour wheel can be employed to determine the degree to which the use of colour is complementary or supplementary to the colour of the environment).

Complementary Colours (3) Supplementary Colours (2) **Neutral Colours (1)**

iv.) Texture:

(Depending on the textures in the environment, either abundance or absence of texture could be incompatible with the environment).

Low compatibility (3) Medium compatibility (2) High compatibility (1)

*** Instructions:**

The total score will indicate the general level of compatibility of the development with the landscape:

Score 0 - 4 – *High compatibility* – blends in well with the surroundings.

Score 5 - 8 – *Medium compatibility* – partially fits into the surroundings, but clearly noticeable.

Score 9 - 12 – *Low compatibility* – visually intrudes or is discordant with the surroundings.

The Score is **10/12** – thus **low compatibility** with the existing scenic quality of the environment is determined.

4.3.4 VISUAL ABSORPTION CAPACITY AND 'BACK-CLOTHING'

The thick shrubland of the receiving environment serves to visually absorb the development and obscure it from view in many instances. However, due to the very large size of the development, Visual Absorption Capacity fails to do so entirely, thus the development will become very visible to viewers intermittently.

4.4 LEVEL OF CHANGE TO THE ENVIRONMENT

Each of the ten questions below has been considered and responses that most closely applied to the project in question had been selected. Each response has a corresponding point value. The total score will represent the level of change of the development.

4.4.1 CHANGE TO THE VISUAL ENVIRONMENT

i.) Will the project result in a noticeable change in the physical characteristics of the existing environment?

(Considering all project components and construction impacts).

High level of change (3) Moderate level of change (2) Low level of change (1)

ii.) Will the project complement or contrast with the visual character desired by the community?

(Evaluating the scale and extent of the project features compared to the surrounding scale of the community. Is the project likely to give an urban appearance to an existing rural or suburban community? Is the change viewed as positive or negative? Research planning documents or talk with local planners and community representatives to get a rough idea of what type of visual environment local residents envision for their community).

Highly incompatible (3) Somewhat incompatible (2) Somewhat compatible (1)

iii.) What types of project features and construction impacts are proposed? Are bridge structures, large excavations, sound barriers, or median planting removal proposed?

(Certain project improvements can be of special local interest, causing a heightened level of public concern, and requiring a more focused visual analysis.)

High concern (3) Moderate concern (2) Low concern (1)

iv.) Will the project changes likely be mitigated by normal means such as landscaping and architectural enhancement, or will avoidance measures be necessary to minimize adverse change?

(Consider the type of changes caused by the project, i.e., can undesirable views be screened, or will desirable views be permanently obscured)?

Project alternative may be needed (3) Extensive mitigation likely (2 Normal mitigation (1)

v.) Will this project, when seen collectively with other projects, result in an aggregate adverse change in overall visual quality or character?

(Identification of contributing projects should include any in the area that have been constructed within the last couple of years and those currently envisioned or planned for future construction. The window of time and the extent of area applicable to possible cumulative impacts should be based on a reasonable anticipation of the viewing public's perception).

Impacts likely in 0-5 years (3) Impacts likely in 6-10 years (2) Cumulative Impacts unlikely (1)

4.4.2 VIEWER SENSITIVITY

i.) **What is the potential that the project proposal may be controversial within the community, or opposed by any organized group?**

(This is evident from concerns received by EAP).

High Potential (3) Moderate Potential (2) Low Potential (1)

ii.) **How sensitive are potential viewer-groups likely to be regarding visible changes proposed by the project?**

(Considering among other factors the number of viewers within the group, probable viewer expectations, activities, viewing duration, and orientation).

High Sensitivity (3) Moderate Sensitivity (2) Low Sensitivity (1)

iii.) **To which degree does the project appear to be consistent with applicable laws, ordinances, regulations, policies or standards?**

(These documents are critical in understanding the importance the local communities place on aesthetic issues).

Incompatible (3) Moderately compatible (2) Largely compatible (1)

iv.) **Are any permits going to be required by outside regulatory agencies (national, provincial or municipal) to allow development to proceed?**

Yes (3) Maybe (2) No (1)

v.) **Will the Project Development Team or public benefit from a more detailed visual analysis in order to help reach consensus on a course of action?**

(Considering the proposed project features possible environmental impacts, and probable mitigation recommendations).

Yes (3) Maybe (2) No (1)

Score 25-30 – Very high visual change rating

Score 20-24 – High visual change rating

Score 15-19 – Moderate visual change rating

Score 10-14 – Low visual change rating

The Score is **30/30** – The proposed development is characterised by a **very high visual change rating.**

4.5 VISUAL IMPACT ASSESSMENT CRITERIA

The assessment of impacts is based on a synthesis of the visual change rating and the following assessment criteria (Oberholzer, 2005)[5]:

Extent – the spatial or geographic area of influence of the visual impact, i.e.:

- *site-related:* extending only as far as the activity (1)
- *local:* limited to the immediate surroundings (2)
- ***regional:* affecting a larger metropolitan or regional area (3)**
- *national:* affecting large parts of the country (4)
- *international:* affecting areas across international boundaries (5)

Duration – the predicted lifespan of the visual impact:

- *short term,* (e.g. duration of the construction phase) (1)
- *medium term,* (e.g. duration for screening vegetation to mature) (2)
- *long term,* (e.g. lifespan of the project) (3)
- ***permanent,* where time will not mitigate the visual impact. (5)**

Intensity – the magnitude of the impact on views, scenic or cultural resources.

- *low,* where visual and scenic resources are not affected (1)
- *medium,* where visual and scenic resources are affected to a limited extent (3)
- ***high,* where scenic and cultural resources are significantly affected. (5)**

Probability – the degree of possibility of the visual impact occurring:

- *improbable,* where the possibility of the impact occurring is very low (1)
- *probable,* where there is a distinct possibility that the impact will occur (2)
- *highly probable,* where it is most likely that the impact will occur (3)
- ***definite*, where the impact will occur regardless of any prevention measures. (5)**

Significance – The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, intensity, extent and probability, and be described as:

- *low,* where it will not have an influence on the decision (1)
- *medium,* where it should have an influence on the decision unless it is mitigated (3)
- ***high*, where it would influence the decision regardless of any possible mitigation (5)**

Score 20 - 25 – Very high visual change rating

Score 15 - 19 – High visual change rating

Score 9 - 14 – Moderate visual change rating

Score 0 - 8 – Low visual change rating

The Score is **23/25** – The proposed development poses a **very high visual impact rating.**

4.6 IMPACT ASSESSMENT FINDINGS

- Due to the development's size, it is anticipated to be **highly visible.**
- Due to its proximity to vantage points it is anticipated to be **highly visible.**
- it is anticipated to **dominate the field of view** for some vantage points
- The level of contrast the development will have in relation to its environment scores **10/12**, constituting a contrast value of **83%.** This indicates a **high contrast ratio**, with anticipated **low compatibility** (17%) with surrounding scenery.
- The proposed development poses an anticipated visual change rating of **30/30**, thus **100%**, constituting a **very high visual change rating.**
- The proposed development poses an anticipated visual impact rating of **23/25**, thus **84%**, constituting a **very high visual impact rating.**

5 CONCLUSIONS

5.1 IDENTIFICATION OF SENSITIVE RECEPTORS

The VIA must be fit for purpose and needs to determine visual impact "*significance*" with respect to both the local, as well as regional, importance of the landscape and its features, their relative pristineness, and their contribution to the Sense of Place of the area.

It must also be taken into account that the development is very large, as well as elevated, and will be visible from many receptors not represented in this study.

A significant portion of visitors and sightseers who visit the area will likely be highly sensitive to any changes in visual quality, and since the sensitive receptors of the development will be in places of natural and recreational interest, it is inferred that the predominant type of viewers will be neutral to negatively inclined toward change. From the perspective of these visitors and sightseers, the landscape capacity is limited in that it is not able to accommodate change without significant effects on its character, or overall change of landscape character type.

5.2 LAND USE CONFLICT

According to Marot & Kruse (2018)[2]: "*A land use conflict is a situation where there is a disagreement on the use of a certain piece of land and/or a belief that people's rights or well-being are being threatened by an action or undertakings of another, or the inaction of another party.*"

The proximity to numerous protected environments and game farms creates a very strong Sense of Place and very high scenic sensitivity which should not be threatened. Any economic fallout due to the visual impact of the proposed WEF on the eco-tourism industry in the area puts these areas at risk. The construction of the proposed WEF is in conflict with the existing land use in many surrounding areas of eco-tourism.

5.3 LANDSCAPE SENSITIVITY AND COOKHOUSE REDZ

Figure 3-2 shows that the area of the cookhouse REDZ in which the WEF is proposed is acknowledged as mostly 'very high' and 'high' visual sensitivity and therefore not ideally suitable for wind farm development.

One of the primary objectives of the Strategic Environmental Assessment for wind and solar photovoltaic energy in South Africa was to undertake scoping level environmental assessment for the focus areas such that wind or PV projects within the focus areas can undertake a Basic Assessment (BA), rather than a full S&EIA process. In no way does the presence of the REDZ excuse environmental impacts or lower the bar for the assessment of environmental impacts and the protection of the environment. In fact, for those areas identified as very high sensitivity, the bar for the assessment of visual impacts is raised, as The SEA indicates that "*Proponents intending to develop a wind of solar PV facility that triggers an environmental impact assessment process in very high sensitivity areas inside adopted REDZs must prove to the relevant competent authority that the proposed development will not have an unacceptable negative impact on sensitive local and/or regional aesthetic and scenic values*".

The onus is on the proponent to dispute the very high sensitivities identified by the SEA.

Furthermore, Page 165 of Socio-Economic Scoping Assessment Specialist Report Undertaken For The Strategic Environmental Assessment For Wind And Solar Photovoltaic Energy In South Africa indicates:

> "*There is also a possibility that prices of land in some areas of REDZ could actually drop with the development of wind or solar PV projects. This scenario will apply to all the areas and land parcels that are situated in picturesque areas and are currently deriving their income from eco-tourism and hunting. Establishment of wind or solar PV projects in areas that may affect the landscape and aesthetics of the environment that is used to generate revenue from tourists will negatively impact the attractiveness of the area. As a result, the area might no longer be suitable for tourism-related activities or the revenue that could be generated from such activities would be significantly reduced. Since land values are linked to future economic value of revenue that could be derived from it, decline in tourism numbers completely or partially will lead to a decline in revenue, which subsequently results in the decrease of business value and land that is used to derive the revenue. In order to mitigate the potential decline in land prices in selected areas,* ***wind and solar PV projects should not be developed on land parcels that derive their income from ecotourism or commercial game hunting and within the buffer zones of these sites***."

Just because the project falls within the REDZ, does not mean that the entire REDZ is suitable for the proposed development. The REDZ SEA is in essence only a pre-assessment, and it

should be common knowledge that many parts of the REDZ are unsuitable for Wind Energy Facilities.

Moreover, when cumulative impacts are considered, from both the existing, as well as proposed, WEFS in the area, all the impacts are exacerbated. The visual impact will be much greater, and thus the effects on Sense of Place as well as the views and opinions of the visitors that come to the world-renowned protected areas in the region will be heightened, potentially have fatal effects on wildlife and nature tourism.

5.4 CONSIDERATION OF LIFESPAN OF WEF

When assessing the environmental impact of a WEF, the lifespan should be considered. In doing so one should consider the reality of turbines and wind energy technology development and turbine tower and blade advances which make application of taller and larger bladed turbines more economical.

Typically wind farms are redeveloped during their productive lifespans for example by raising and increasing blade diameter. This means that the expected lifespan of the WEF is longer than 25 years and can even be permanent, but with increasing visual impacts as the towers are lifted.

Based on this, it can be concluded that there will be a long term high visual impact from sensitive viewpoints that will affect the character and Sense of Place of the area and may have a negative impact on wildlife tourism.

5.5 POTENTIAL MITIGATION AND CONSIDERATION OF ALTERNATIVES

A reduced hub height operating at a site with a good wind resource may still compete with a turbine of higher hub height at a site with poorer wind resource. Therefore, reduced hub height should be considered as a potential mitigation measure to mitigate against the negative affect on the areas character and Sense of Place and hence its desirability to tourists. The no-go alternative must also be strongly considered.

We submit that proper assessment and consideration of these alternatives in line with the minimum requirements for “alternatives” as prescribed in the EIA regulations would most

likely demonstrate that the proposed location for the WEF is not suitable for the development.

5.6 ASSESSMENT OF SIGNIFICANCE OF VISUAL IMPACT

In views uninterrupted by landscape features, as can be seen in the view simulations, the proposed developments introduce nothing but a drastic change to the current scenic value. The capacity of the landscape is not adequate to accommodate the WEF without significant effects on its character, or overall change of landscape character type.

Whereas the landscape can currently be described as rural and/or natural. Should the WEF be constructed the landscape would become what is defined as an energy landscape. As detailed in section 4:

- The proposed development poses an anticipated visual change rating of **30/30**, thus scoring **100%,** indicating that the developments lie in the extreme top of visual effects with a **very high visual change rating.**
- The proposed developments pose an anticipated visual impact rating of **23/25**, thus **84%**, constituting a **very high visual impact rating.**

For these reasons, the WEF cannot be deemed to be desirable at this location from a visual impact and Sense of Place perspective.

ANNEXURE A – SENSE OF PLACE

ANNEXURE B – VIEW SIMULATIONS