CREATE LANDSCAPE ARCHITECTURE AND CONSULTING

Landscape and Visual Impact Assessment

For the development of the proposed Humansdorp solar photovoltaic (PV) facility

Prepared for:

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2 Structure of the report

The specialist study was undertaken in compliance with Appendix 6 of GN 982 of 4 December 2014, as amended by Appendix 6 of GN 326 of 7 April 2017. Table 1 indicates how Appendix 6 has been adhered to in this report.

Table 1: Indication of compliance with Appendix 6 of GN 326 of 7 April 2017

NEMA Regulations (2017) Appendix 6	Relevant sections
(1) A specialist report prepared in terms of these Regulations must contain -	
(a) details of -	
(i) the specialist who prepared the report; and	Appendix D
(ii) the expertise of that specialist to compile a specialist report, including a curriculum vitae;	Appendix D
(b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Page 14
(c) an indication of the scope of, and the purpose for which, the report was prepared;	Section 8.3
(cA) an indication of the quality and age of base data used for the specialist report;	Section 11.2.1
(cB) a description of existing impacts on site, cumulative impacts of the proposed development and levels of acceptable change;	Section 12.6 and 12.7
(d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 11.2.2
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 11 (Appendix A and B)
(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 alternative;	Section 11
(g) an identification of any areas to be avoided, including buffers;	N/A- findings from ecological assessment may be used to conserve natural visual resources
(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;	N/A- findings from ecological assessment may be used to conserve natural visual resources
(i) a description of any assumptions made and any uncertainties or gaps in knowledge;	Section 10
(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;	Section 14
(k) any mitigation measures for inclusion in the EMPr;	Section 14
(l) any conditions for inclusion in the environmental authorisation;	N/A
(m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	N/A
(n) a reasoned opinion -	
(i) as to whether the proposed activity, activities or portions thereof should be authorised;	Section 15
(iA) regarding the acceptability of the proposed activity or activities; and	Section 15

NEMA Regulations (2017) Appendix 6	Relevant sections
(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 Environmental Management Programme (EMPr), and where applicable, the closure plan;	Section 14 and 15
(o) a description of any consultation process that was undertaken during the course of preparing the specialist report	N/A
(p) a summary and copies, if any, comments received during any consultation process and, where applicable all responses thereto; and	N/A
(q) any other information requested by the competent authority.	No other information requested

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Figures

Tables

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4 List of acronyms

Acronym	Description
ALOS	Advanced Land Observation Satellite
BLM	Bureau for Landscape Management
BPEO	Best Practicable Environmental Option
CBA	Critical Biodiversity Area
DEA&DP	Department of Environmental Affairs and Development Planning
DEM	Digital Elevation Model
DTM	Digital Terrain Model
CSIR	Council for Scientific and Industrial Research
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMPr	Environmental Management Program
FAA	Federal Aviation Administration
GIS	Geographic Information System
GN	General Notice
GPS	Global Positioning System
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation
IEMA	Institute of Environmental Management and Assessment
ILP	Institute for Lighting Professionals
KLM	Kouga Local Municipality
KOP	Key Observation Point
LED	Light Emitting Diode
LVIA	Landscape and Visual Impact Assessment
MAP	Mean Annual Precipitation
MSP	Municipal Spatial Plan

Acronym	Description
NEMA	National Environmental Management Act
PS	Performance Standard
PV	Photovoltaic
S&EIR	Scoping and Environmental Impact Report
SANBI	South African National Biodiversity Institute
SANLC	South African National Land Cover
SANS	South African National Standards
SDF	Spatial Development Framework
SEF	Solar Energy Facility
SPLUMA	Spatial Planning Land Use Management Act
VAC	Visual Absorption Capacity
VRM	Visual Resource Management
WEF	Wind Energy Facility
ZTV	Zone of Theoretical Visibility
3D	Three-dimensional

5 Abbreviations

Abbreviation	Explanation
amsl	above mean sea level
DC	Direct Current
m^2	square meter
ha	hectare
km	kilometre
kV	kilo Volt
M	meter
mamsl	meters above mean sea level
mm	millimetre
MWp	MegaWatt peak
no.	number
°C	degree Celsius

6 Glossary

Term	Description
Alternative	A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EISA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives and input alternatives.
Characteristic	An element, or combinations of elements, which contribute to landscape character.
Cumulative impact	Cumulative impacts can result from individually minor but collectively significant activities taking place over a period.
Development	Any proposal that results in a change to the landscape and/ or visual environment.
Element	Individual part, which makes up the landscape, for example trees and buildings.
Environmental Impact Assessment	A public process that is used to identify, predict, or cause the least damage to the environment at a cost acceptable to society, in the long term as well as in the short term.
Feature	Particularly prominent or eye-catching elements in the landscape such as tree clumps, church towers or wooded skylines.
Geographic Information System	A system that captures, stores, analyses, manages, and presents data linked to location. It links spatial information to a digital database.
Glare	Continuous source of bright light typically received by static receptors or from large reflective surfaces.
Glint	A momentary flash of bright light typically received by moving receptors or from moving reflectors.
Impact (Visual)	A description of the effect of an aspect of the development on a specified component of the visual, aesthetic, or scenic environment within a defined time and space.
Issue (visual)	Issues are concerns related to the proposed development on a specified component of the visual, aesthetic, or scenic environment within a defined time and space.
Landcover	The surface cover of the land usually expressed in terms of vegetation cover or the lack of it. Related to but not the same as land use.
Landform	The shape and form of the land surface which has resulted from combinations of geology, geomorphology, slope, elevation, and physical processes.
Landscape	An area, as perceived by people, the character of which is the result of the action and interaction, of natural and/ or human factors.
Landscape and Visual Impact Assessment	A Landscape and Visual Impact Assessment simulates and predicts the significance and magnitude of the visual effects on the landscape.
Landscape character	These are distinct types of landscape that are relatively homogeneous in character. They are generic in nature in that they may occur in different areas in different parts of the country, but wherever they occur, they share broadly similar combinations of geology, topography, drainage patterns, vegetation and historical land use and settlement pattern, and perceptual and aesthetic attributes.
Landscape quality	A measure of the physical state of the landscape. It may include the extent to which typical landscape character is represented in individual areas, the intactness of the landscape and the condition of individual elements.
Land use	What land is used for based on broad categories of functional land cover, such as urban and industrial use and the different types of agriculture and forestry.

Term	Description
Landscape value	The relative value that is attached to different landscapes by society. A landscape may be valued by different stakeholders for a variety of reasons.
Level 3 assessment	Identification of issues raised, and site visit; Description of the receiving environment and the proposed project; Establishment of view catchment area and receptors; Brief indication of potential visual impacts, and possible mitigation measures.
Receptor	Individual, group, or community subject to the visual influence of a project.
Sense of place	The unique quality or character of a place, whether natural, rural, or urban allocated to a place or are through cognitive experience by the user. It relates to uniqueness, distinctiveness or strong identity and is sometimes referred to as genius loci meaning "spirit of the place".
Severity	The intensity of the impact on views, scenic or cultural resources.
Significance	The significance of impacts can be determined through a synthesis of the aspects produced in terms of their nature, duration, severity, extent, and probability.
Site	The area which has been covered by the authorization process.
Sky glow	Brightening of the night sky caused by outdoor lighting and natural atmospheric and celestial factors.
Study area	The area included in the 7km buffer around the project area, determined by the ZTV (zone of theoretical visibility).
View catchment area	A geographic area, usually defined by the topography, within which a particular project or other feature would generally be visible.
Viewpoint	A selected point in the landscape from which views of a project or another feature can be obtained.
Viewshed	The outer boundary defining a view catchment area, usually along crests and ridgelines
Visibility	The geographic area from which the project will be visible.
Visual absorption capacity	The ability of an area to visually absorb development because of screening topography, vegetation, or structures in the landscape.
Visual character	The overall impression of a landscape created by the order of the patterns composing it; the visual elements of these patterns are the form, line, colour and texture of the landscape's components. Their interrelationships are described in terms of dominance, scale, diversity, and continuity. This characteristic is also associated with land use.
Visual exposure	The relative visibility of a project or feature in the landscape. Visual exposure is based on distance from the project to selected viewpoints. Visual exposure or visual impact tends to diminish exponentially with distance.
Visual intrusion	The level of compatibility or congruence of the project with the qualities of the area, or its sense of place. This is related to context and maintaining the integrity of the landscape or townscape.
Visual resource	The visible physical features on a landscape (e.g., land, water, vegetation, animals, structures, and other features).

7 Declaration of independence

I, Elmie Weideman 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 it results in views and findings that are not favourable to the applicant;

I declare that there are no circumstances that may comprise my objectivity in performing such work;

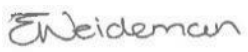
I have expertise in conducting the specialist report relevant to this application, including knowledge of the applicable Regulations and any guidelines that have relevance to the proposed activity;

I will comply with the Regulations and all other applicable legislation;

I have no, and will not engage in, conflicting interest in the undertaking of this 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 is punishable in terms of the applicable legislation.



Signature of the specialist:

Name of company: Create Landscape Architecture and Consulting

Date: March 2023

8 Introduction

EnviroSaint (Pty) Ltd. appointed Create Landscape Architecture and Consulting (Pty) Ltd. to conduct a specialist Landscape and Visual Impact Assessment (LVIA), which will form part of the application for Environmental Authorisation (EA) for the proposed photovoltaic (PV) solar energy facility (SEF) for Kouga Local Municipality (KLM) outside Humansdorp, Eastern Cape Province.

The LVIA forms part of a Basic Assessment (BA) process which will be conducted for this project, based on the triggering of activities listed in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations of 2014.

8.1 Project Background

KLM (the Applicant) proposes to develop the Humansdorp SEF comprising of a 19.8 MW solar facility combined with a Battery Energy Storage System (BESS) on municipally owned land north of Humansdorp. The SEF will supply renewable energy primarily to Humansdorp via the adjacent melkhout switching station. Energy generated in excess of that absorbed by Humansdorp will be made available to the remainder of the municipality, including St. Francis, Jeffreys Bay and other areas.

The proposed activities that form part of the application will include:

- Access via an existing dirt road;
- Ground-mounted solar panels (~19.8ha) consisting of Crystalline-silicon PV solar modules secured by racks or frames that are attached to ground-based single-axis tracking structures. Blocks of the above-mentioned panels will be connected to Inverter Stations (containerised), and a Direct Current (DC) combiner box located at each inverter station;
- A Battery Energy Storage System (BESS) consisting of Lithium-ion based batteries to store electricity and supply power at times that the solar panels do not generate electricity;
- The SEF will connect into the municipality controlled existing Melkhout switching station via a short 66kV transmission line. The Melkhout switching station is located directly next to (southeast) of the Eskom substation;
- A fence which will be erected around the perimeter of the site and a permanent guard house which will be positioned at the entrance of the SEF site;
- Internal roads, no more than 6.8m wide with no reserve, will be constructed to give access to the solar panels to perform maintenance; and
- Civil services including water (construction phase: potable use and construction activities. Operational phase: potable use at the guard house and for performing maintenance on the solar panels), and power supply for the construction phase.

8.2 Project Location

The proposed SEF is located east of the R330, the provincial road that connects St. Francis in the south to Hankey in the north via Humansdorp. The site is located northeast of the N2 – Humansdorp interchange, approximately 3.5 km north-north-east of the centre of Humansdorp.

The site is surrounded by farmland and wind energy facilities (WEF's) located on farmland mostly east of the proposed site. The N2 highway, which connects the Western Cape on the western side with the Eastern Cape on the southern side, bisects the area between the proposed SEF and Humansdorp. The area to the south of the N2, as far east as Jeffreys Bay, is intensively used primarily for dairy farms, and includes large numbers of pivot irrigation facilities

that are used to produce forage for dairy cows. The R102, which runs approximately 1 – 1.5km south of and parallel to the N2, connects Jeffreys Bay with Humansdorp.

Besides Humansdorp, the largest towns in the region are Jeffreys Bay (13km east southeast of the site) and St. Francis Bay (18 km south of the site).

The site and surrounding towns form part of the Kouga Local Municipality (Figure 2).

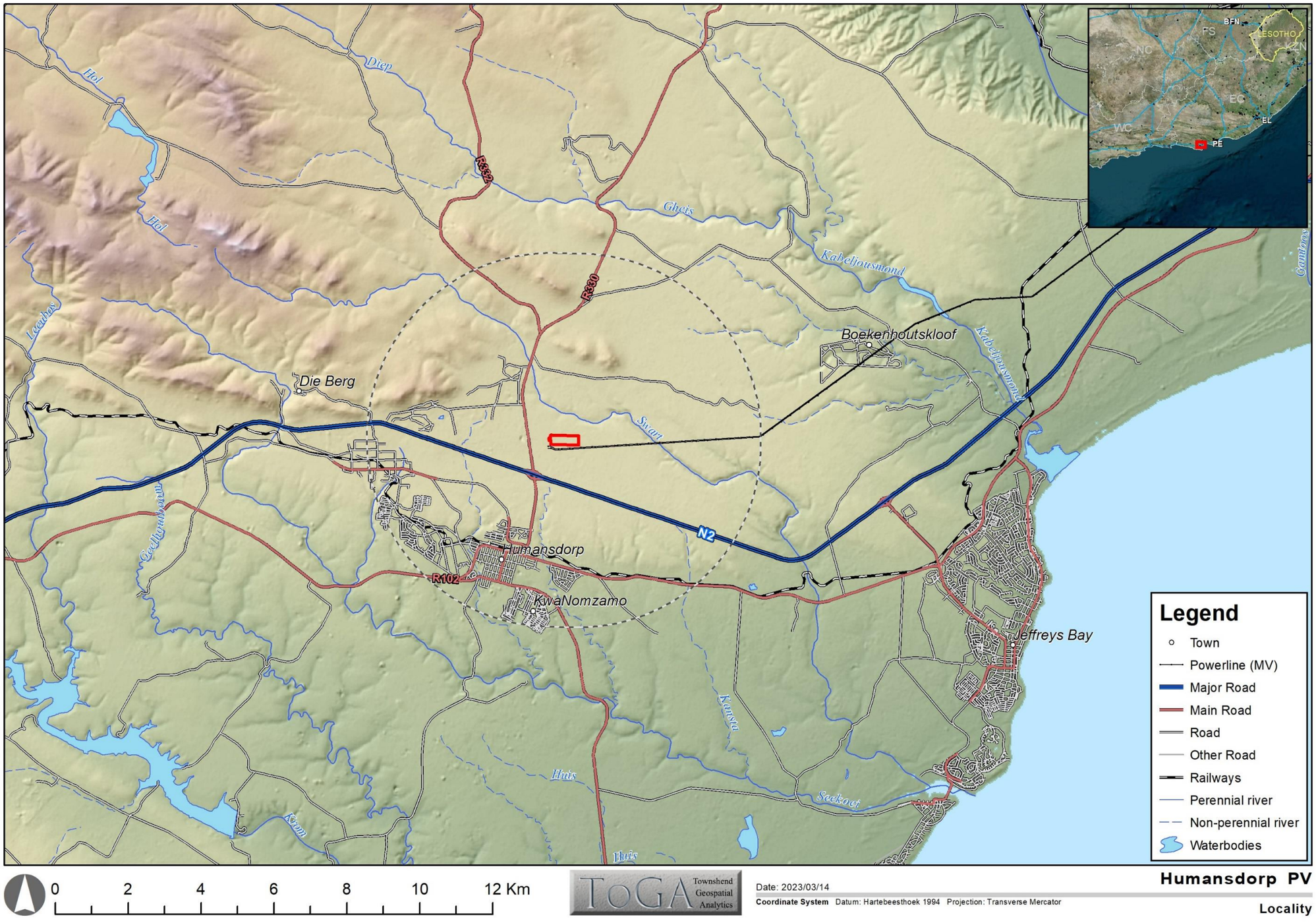


Figure 1: Locality Map

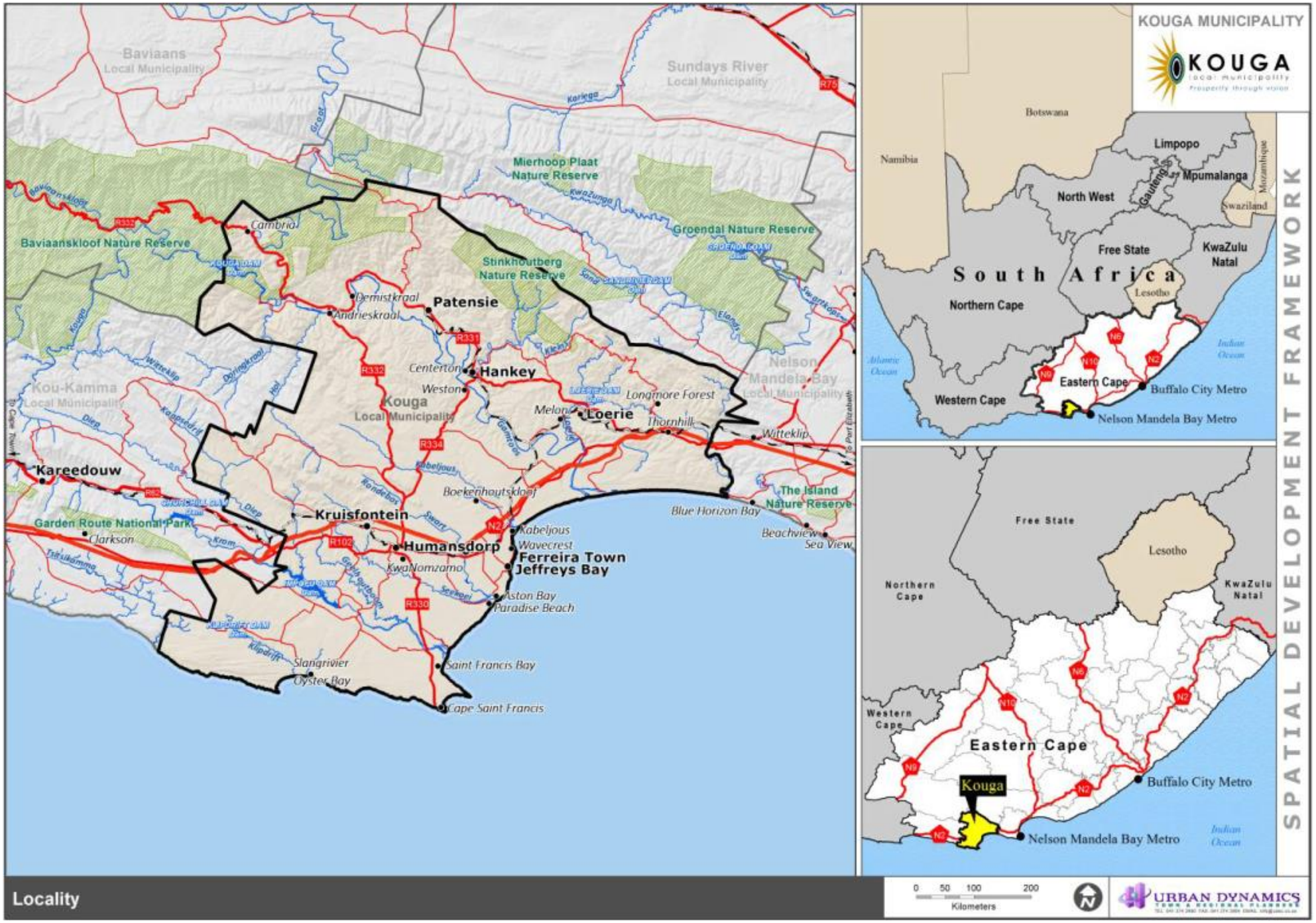


Figure 2: Kouga Local Municipality extent and location (Kouga Local Municipality. 2020.SDF).

8.3 Purpose of this report and scope of work

The purpose of the report is:

- To establish the study area which will include the site itself and the full extent of the wider landscape around it, which the proposed development could potentially influence in a significant manner, the Zone of Theoretical Visibility (ZTV);
- To establish the landscape baseline in terms of physical influences, land cover, influence of human activity, aesthetic, and perceptual aspects as well as the landscape character and overall sense of place;
- To establish a value to the potentially affected landscape;
- To establish the visual baseline in terms of the area in which the project will be visible, the different groups of people (visual receptors) who may experience views of the proposed development, the places where they will be affected (Key Observation Points – KOPs), the nature of the views, and the visual amenity at these places;
- To assess the landscape effects which deals with the effects of change and development on the landscape as a resource by means of:
    - Identifying components (individual elements or key features) of the landscape that are likely to be affected by the proposed development;
    - Identifying interactions between the landscape receptors and the different components of the development during all the different project stages;
    - Assess the visual effects which deals with the effects of change and development on the views available to people and their visual amenity;
    - Assess the cumulative landscape and visual effects; and
    - Propose mitigation measures to minimise any potential landscape and visual impacts during the planning, construction, and operational phase of the proposed project.

8.4 Development Category and Level of Assessment

The *Guideline for Involving Visual and Aesthetic Specialist on EIA Processes* (Oberholzer, B. 2005) specifies that the depth and scope of a LVIA should be based on a combination of the sensitivity of the existing environment and the nature of the development. The type of environment and type of development are both divided into five categories, which are indicated in a matrix below. The combination of development category and type of environment relevant to this proposed SEF is indicated by the coloured cells.

Table 2: Categories of development and impact severity

Categories of development and impact severity. Type of environment	**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

Categories of development and impact severity. Type of environment	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Areas or routes of moderate scenic, cultural, historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, 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 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

Table 3: Key categories of development

Category 1 development: e.g., nature reserves, nature-related recreation, camping, picnicking, trails, and minimal visitor facilities.

Category 2 development: e.g., low-key recreation / resort / residential type development, small-scale agriculture / nurseries, narrow roads and small-scale infrastructure.

Category 3 development: e.g., low-density resort / residential type development, golf or polo estates, low to medium-scale infrastructure.

Category 4 development: e.g., medium density residential development, sports facilities, small-scale commercial facilities / office parks, one-stop petrol stations, light industry, medium-scale infrastructure.

Category 5 development: e.g., high density township / residential development, retail and office complexes, industrial facilities, refineries, treatment plants, power stations, wind energy farms, power lines, freeways, toll roads, large scale infrastructure generally. Large-scale development of agricultural land and commercial tree plantations. Quarrying and mining activities with related infrastructure.

Key categories of issues include:

Very high visual impact expected:

- Potentially significant effect on wilderness quality or scenic resources;
- Fundamental change in the visual character of the area;
- Establishes a major precedent for development in the area.

High visual impact expected:

- Potential intrusion on protected landscapes or scenic resources;
- Noticeable change in visual character of the area;
- Establishes a new precedent for development in the area.

Moderate visual impact expected:

- Potentially some effect on protected landscapes or scenic resources;
- Some change in the visual character of the area;
- Introduces new development or adds to existing development in the area.

Minimal visual impact expected:

- Potentially low level of intrusion on landscapes or scenic resources;
- Limited change in the visual character of the area;
- Low-key development, similar in nature to existing development.

Little or no visual impact expected:

- Potentially little influence on scenic resources or visual character of the area;
- Generally compatible with existing development in the area;
- Possible scope for enhancement of the area.

From the above, the severity of the impact determines the level of the assessment:

Table 4: Categorisation of approaches used for visual assessment

Approach	**Little or no visual impact expected**	**Minimal visual impact expected**	**Moderate visual impact expected**	**High visual impact expected**	**Very high visual impact expected**
Level of visual input recommended	Level 1	Level 2	Level 3	Level 4	

Through the application of the LVIA methods of assessment as presented in the above section and tables, it was determined that the proposed project can be defined as a Category 3 development. According to Oberholzer, B. (2005), a theoretical moderate visual impact is expected, due to the existing presence of several wind farms and large scale electrical infrastructure, including an Eskom substation and transmission lines. Based on the combination of the desktop study and site visit, there is a potential intrusion on views and a change in landscape character (potentially more so during the construction phase of the project). In line with the above, a Level 3 Assessment is recommended for the BA for this project.

Typically, a Level 3 Assessment includes:

- Identification of issues raised in scoping phase (if applicable)
- Description of the receiving environment and the proposed project;
- Establishment of view catchment area, view corridors, viewpoints, and receptors;
- Indication of potential landscape and visual impacts using established criteria;
- Inclusion of potential lighting impacts at night (the potential impacts of lighting were not included as it is unclear at this stage whether lighting is planned for the development); and
- Description of alternatives (where applicable), mitigation measures and monitoring programmes.

8.5 Main issues identified

Various potential landscape and visual impact issues were identified and include the following:

- Construction and earthmoving activities, movement of vehicles and construction equipment may impact on the aesthetic environment during construction;
- There are likely to be visual changes to the receiving environment associated with the construction of infrastructure. These changes would mainly be related to the removal of vegetation. Dust generation is also likely to increase (construction of internal roads through the site);
- Potential glint and glare from PV panels; and
- The proposed project could change the existing landscape and visual aesthetics.

9 Legislation, Institutional Framework and Guidelines

9.1 Policies and plans

Oberholzer, B. (2005) indicates that current South African environmental legislation governing the EIA process (which may include consideration of visual impacts if this is identified as a key issue of concern) is the NEMA (Act 107 of 1998). This includes the 2014 NEMA EIA regulations as amended.

In addition, the following acts and guidelines are applicable (Oberholzer, 2005):

- National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003). This act is intended to identify and protect natural landscapes.
- National Heritage Resources Act, 1999 (Act No. 25 of 1999). This Act provides legal protection for listed or proclaimed sites, such as urban conservation areas, nature reserves and proclaimed scenic routes.
- Advertising on Roads and Ribbons Act (Act 21 of 1940): This Act controls visual pollution to a limited extent, as it deals with signage on public roads.
- The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA) provides a framework for spatial planning and land use management in South Africa and specifies the relationship between the spatial planning and the land use management system and other kinds of planning. It provides a framework for the monitoring, coordination and review of the spatial planning and land use management system.

9.2 Kouga Integrated Development Plan (2020)

It is compulsory for all municipalities to initiate an Integrated Development Plan (IDP) every 5 years. IDPs provide a strategic plan for the area under a municipality's control. The IDP process, specifically the spatial component, is based in certain areas and provinces on a bioregional planning approach to achieve continuity in the landscape and to maintain important natural areas and ecological processes.

The IDP encourages integration of projects, programmes and activities between municipal departments and directorates, and with organs of state and traditional authorities. It hereby facilitates integrated service delivery, providing cross-sectoral services to communities. As a key strategic plan of the municipality, the priorities identified in the IDP must inform all financial planning and budgeting undertaken by the municipality.

KLM's IDP 2020's vision, mission, goals and values are shown in Figure 3.

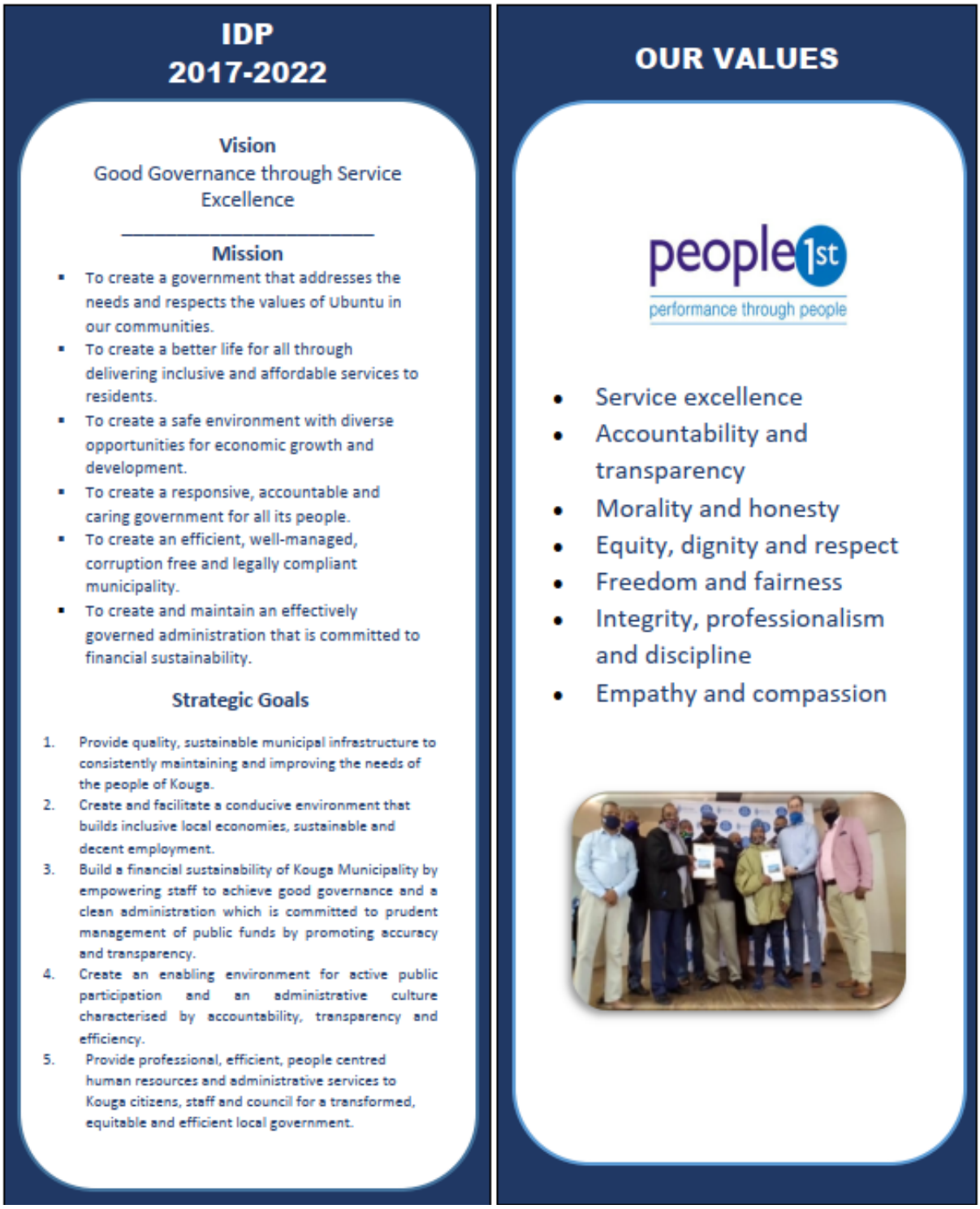


Figure 3 KLM IDP's vision, mission, goals and values (KLM, 2020: 15)

The Sector Plan portion of the IDP lists the key focus areas of the various sectors within the municipal administration, including an "Electricity Master Plan" (KLM, 2022: 62). The purpose of the master plan is to "expand and improve the electrical network for the municipality and to maintain the existing electrical infrastructure." The role and contribution of the Electricity Master Plan is "*To investigate means to reduce the town's energy usage by implementing green and alternative energy projects.*"

Under the IDP's Key Performance Areas (KPAs) is KPA 1 (*Basic Services and Infrastructure*), which includes 16 Key Functional Areas (KFAs), including KFA 3 (*Electricity Supply, Efficiency and Infrastructure*). Under KFA 3 (KLM, 2020: 171), it is mentioned that "*Kouga municipality are* (sic) *in the process of looking for alternative energy generation to reduce power failures and*

to curb load shedding for their consumers. This will improve economic development activities in the area with a more sustainable energy supply which will also contribute to the reduction in the carbon footprint and the drive towards a green economy." Four wind energy facilities are already established within KLM's area of jurisdiction, although they supply electricity to Eskom and not directly to the KLM.

Therefore, the proposed SEF is well-aligned with the Electricity Master Plan and KPA 1 of the KLM's IDP, as it supports the KLM's ambition to provide a sustainable source of renewable electricity to its citizens.

9.3 Kouga Spatial Development Framework (Review 2020)

The Kouga Municipal Spatial Development Framework (SDF) (KLM, 2021) is "*a framework that seeks to influence the overall spatial distribution of current and future land use within Kouga in order to give effect to the vision, goals and objectives of the municipal Integrated Development Plan (IDP)*". This document articulates the desired land use patterns within the KLM.

The Municipal Spatial Plan (MSP), which articulates the KLM's vision for spatial development within the municipal area, indicates the area within which the SEF is proposed to be located as a Critical Biodiversity Area (CBA) 1 (see Figure 4).

According to the SDF, the land use zones in the MSP must be read in conjunction with the Land Use Management Guidelines set out in Chapter 5. The "*Desired Spatial Form*" for the Humansdorp portion of the KLM is shown in Figure 5. This designates the site of the proposed SEF to fall within the Humansdorp Commonage, which is indicated in section 3.2 of the SDF to "*not have high value from an agricultural production perspective and in most cases also fall within sensive*[1] (sic) *biodiversity categories. Commonage management plan needs to be prepared to avoid degradation of the land and negative impacts on the ground water resources*." (KLM, 2021: 79).

Considering the spatial guidelines of the SDF, the site on which the SEF is proposed to be constructed is considered to be an area of sensitive biodiversity and is accordingly designated as a CBA 1.

[1] Presumably this is meant to read "*sensitive*".

Figure 4 KLM Municipal Spatial Plan (KLM, 2021: 57)

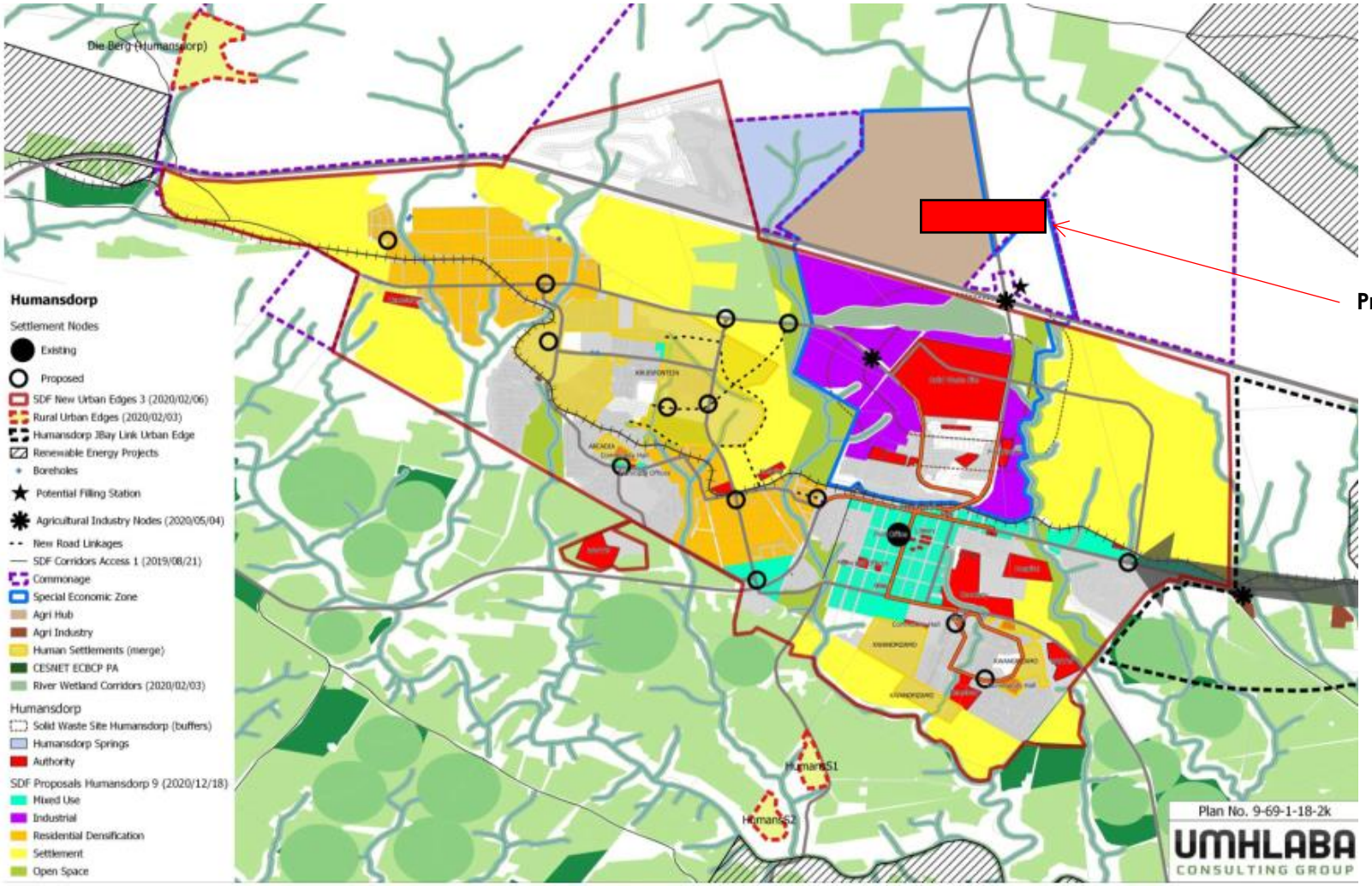


Figure 5 Humansdorp "Desired Spatial Form" with the approximate position and size of the SEF superimposed (KLM, 2021: 77)

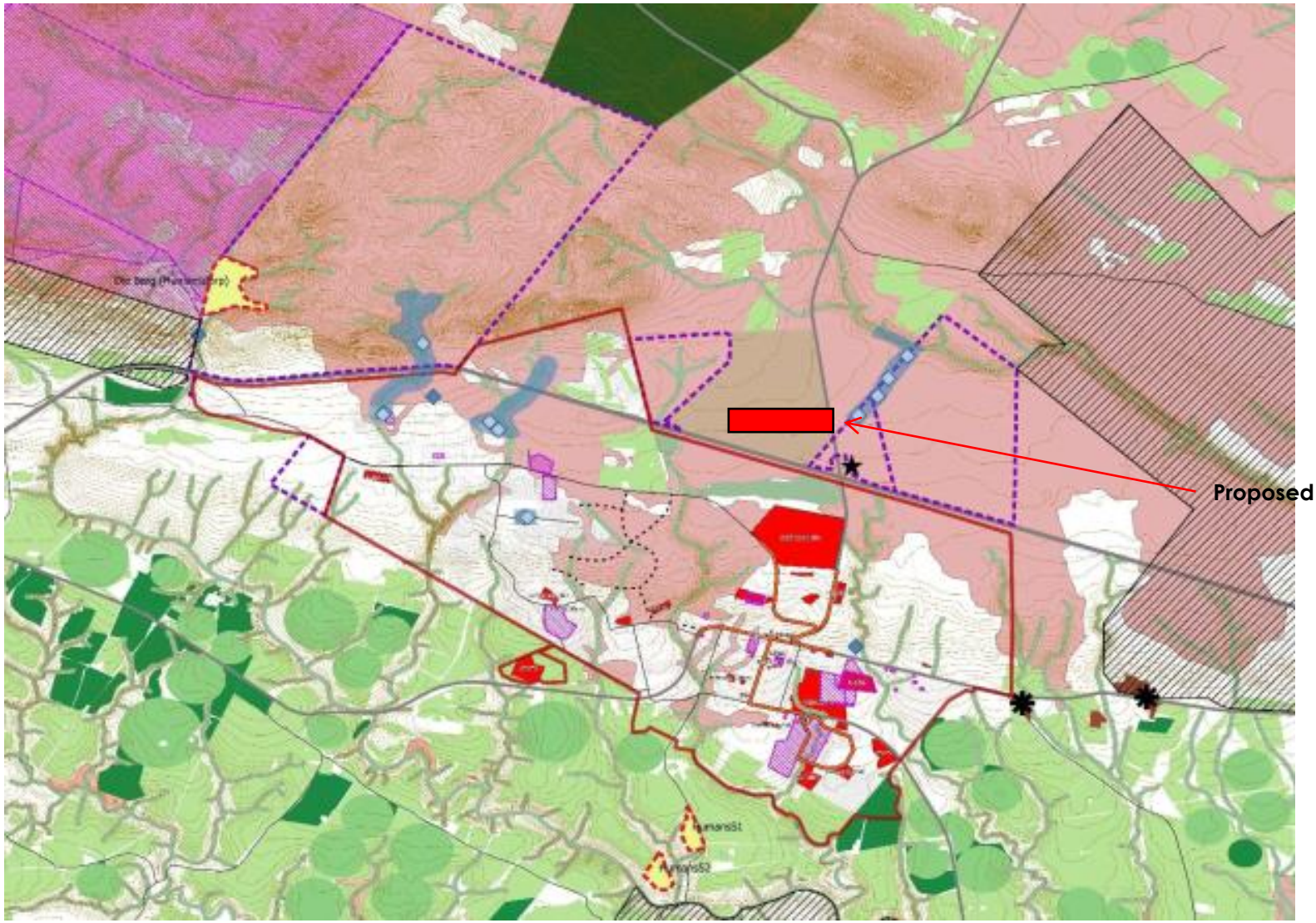


Figure 6 Humansdorp Commonage (in pink) with the approximate position and size of the SEF superimposed (KLM, 2021: 79)

9.4 Guideline documents

9.4.1 Guideline for Visual and Aesthetic Specialists in EIA processes

This guideline was coordinated by the Council for Scientific and Industrial Research (CSIR), compiled by Bernard Oberholzer Landscape Architects, and issued by the Provincial Government of the Western Cape under the Department of Environmental Affairs and Development Planning (DEA&DP). The purpose of this guideline was to provide decision-makers with adequate and appropriate information about the potential positive and negative visual and aesthetic impacts of a proposed development and any associated management actions in order to make an informed decision on whether or not to approve, proceed with, or finance the development.

Visual resources have value in terms of the regional economy and inhabitants of the region. Furthermore, these resources are often difficult to place a value on as they normally also have cultural or symbolic values. Therefore, LVIA's are to be performed in a logical, holistic, transparent, and consistent manner. Oberholzer (2005) identifies the following concepts to form an integral part of the LVIA process:

- Visual resources include the visual, aesthetic, cultural and spiritual aspects of the environment, which contribute toward and define an area's sense of place;
- Natural and cultural landscapes are inter-connected and must be considered as such;
- All scenic resources, protected areas, and sites of special interest within a region need to be identified and considered as part of the LVIA;
- All landscape processes such as geology, topography, vegetation, and settlement patterns that characterise the landscape must be considered;
- Both quantitative criteria, such as 'visibility' and qualitative criteria, such as aesthetic value or sense of place must be included as part the study;
- LVIA's must inform the EIA process in terms of visual inputs; and
- Public involvement must form part of the process.

The guideline furthermore recommends that the LVIA process identifies the Best Practicable Environmental Option (BPEO) based on the following criteria:

- Long term protection of important scenic resources and heritage sites;
- Minimisation of visual intrusion on scenic resources;
- Retention of wilderness or special areas intact as far as possible; and
- Responsiveness to the area's uniqueness, or sense of place.

9.5 International guidelines

In addition to Oberholzer, B. (2005) the following guidelines provides detail of international best practice and have also been consulted. Together these documents provide a basis for the level of approach:

9.5.1 Guidelines for LVIAs

The Landscape Institute and the Institute of Environmental Management and Assessment (IEMA, 2013) has compiled a guideline that outlines the best practice in landscape and visual impact assessment and is 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" (IEMA, 2013).

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 inter-relationships within the built environment – are an equally important part of our landscape heritage" (IEMA, 2013). The guideline identified the following reasons why landscape is important in both the urban and rural context:

- Landscape is an essential part of our natural resource base;
- Landscape is a reservoir of archaeological and historical evidence;
- Landscape is an environment for plants and animals (including humans);
- Landscape is a resource that evokes sensual, cultural, and spiritual responses and contributes to our urban and rural quality of life; and
- Landscape is a valuable recreation resource.

9.5.2 Visual Resource Management Methodology

The Visual Resource Management (VRM) System is a system developed by the US Department of The Interior - Bureau of Land Management. This system recognises that landscapes (urban as well as rural) have a variety of visual values. These different values warrant different levels of management, and it is therefore necessary to systematically identify and evaluate these values.

9.5.2.1 Manual section 8410

Landscape values are identified through the VRM inventory (Manual Section 8410) and are considered with other resource values in the Resource Management Planning (RMP) process.

9.5.2.2 Manual section 8431

The contrast rating system (Manual Section 8431) provides a systematic means to evaluate proposed projects. It also provides a means to identify mitigating measures that can be taken to minimize adverse visual impacts.

9.5.2.3 Use of basic landscape design principles

Designers have used the basic design elements of form, line, colour, and texture to describe and evaluate landscapes for hundreds of years. Modifications in a landscape which repeat the landscape's basic elements are said to be in harmony with their surroundings. Modifications which do not harmonize often look out of place and are said to contrast or stand out in unpleasing ways. These basic design elements and concepts have been incorporated into the VRM system to lend objectivity, integrity, and consistency to the process.

9.6 IFC (International Finance Corporation) Performance Standards

IFC's 2012 Performance Standards for Environmental and Social Sustainability (hereafter referred to only as IFC Performance Standards) offer a framework for understanding and managing environmental and social risks for high profile, complex or potentially high impact projects. IFC Performance Standards do not explicitly require visual impact assessments, but consideration of visual impacts is embodied in the requirement to consider pollution prevention (including lights pollution) and impacts on ecosystem services.

Under IFC Performance Standard (PS) 3 (Resource efficiency and pollution prevention), the term "pollution" *is used to refer to both hazardous and non-hazardous chemical pollutants in the solid, liquid, or gaseous phases, and includes other components such as pests, pathogens, thermal discharge to water, GHG emissions, nuisance odours, noise, vibration, radiation, electromagnetic energy, and the creation of potential visual impacts including light*." (IFC, 2012).

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).

Considering the landscape context and the nature of the project, it is anticipated that PS 6 will not play a role in terms of this LVIA. PS 3 states that: "*During the project life cycle, the client will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment*". The anticipated impact from lights at night will be negligible and have therefore not been included as a potential visual impact, however various best practice measures in terms of lighting design were included under Section 14.3 of this report.

10 Assumptions, limitations and exclusions

The following limitations and assumptions are applicable to this study:

- Determining a visual resource in absolute terms is not achievable. It is a complex procedure determined through a combination of quantitative (visibility) and qualitative (aesthetic value) criteria. Therefore, a LVIA cannot be entirely objective in this sense. Individuals will evaluate a landscape differently, based on experience, culture, and social background.
- Various factors can enhance or reduce the visual impact of the proposed project, for instance, vegetation near a receptor's view of the proposed project. Other factors include weather, climatic conditions, and seasonal change. Therefore, it is difficult to determine the visual impact of the proposed project from the viewpoint of each individual receptor.
- The technical designs and layouts provided for the preparation of this report are conceptual and based on "worst case scenario" viz. maximum allowable height/s and area coverage. Therefore, the possibility of variation in the design exists. Should there be any significant changes in the designs of the proposed infrastructure, these changes may have to be re-assessed.
- As the location and technical designs of the proposed project components within the site were conceptual at the time of writing this report, the viewshed analysis (Figure 29 **Error! Reference source not found.**) is **Error! Reference source not found.**based on a matrix of points located throughout the proposed site. The analysis therefore is indication of the areas from which the proposed infrastructure may be visible.
- No specific national legal requirements for Landscape and Visual Assessments currently exist in South Africa. However, the assessment of landscape and visual impacts is required by implication when the provisions of relevant acts governing environmental management are considered and when certain characteristics of either the receiving environment or the proposed project indicate that visibility and aesthetics are likely to be significant issues and that visual input is required (Oberholzer, 2005).
- The Guidelines for Involving Visual and Aesthetic Specialists in the EIA Process (Oberholzer, 2005), prepared for the Western Cape DEA & DP, was used together with other well-recognised international guidelines.
- Both the viewshed and site survey assumed that visual receptor's eye height is between 1.5m -1.7m above ground level, based on the average heights for men and women.
- The viewsheds resulting from the Digital Elevation Model (DEM) and as illustrated in this report, indicate the areas from which the proposed project is likely to be visible and do not take local vegetation cover and anthropogenic structures into account. Potential sensitive receptor points have therefore been ground-truthed during the site assessment.
- Key Observation Points (KOPs) represent either a typical view from a viewing location or the range of impacts associated with the project. These locations are usually located on a commonly travelled route from which the project will be visible, or other likely observation points like human settlements.
- KOPs were not visited at night.
- Project phase activities (and duration) were based on typical anticipated activities associated with this type of PV facility projects.
- Visual simulations did not fall under the scope of this study.
- Although the potential effects of solar reflection (glint and glare) are mentioned in this report, a separate detailed glint and glare study was not conducted and modelled.

11 Methodology

11.1 Impact assessment methodology

To allow for sufficient consideration, impacts were assessed using a common, defensible method of assessing significance that will enable comparisons to be made between risks/impacts and will enable authorities, stakeholders, and the client to understand the process and rationale upon which risks/impacts have been assessed. The method to be used for assessing risks/impacts is outlined in Appendix A and is a standard rating system.

11.2 Landscape and visual assessment methodology

The methodology is based on the following sources as set out in sections 9.4 and 9.5. A combination of the listed assessment criteria allows for increased objectivity and consistency, of which further detail is provided in Appendix B.

11.2.1 Desktop Study

The desktop investigation served as a planning basis for the site visit by identifying preliminary areas of importance (focus areas) in terms of potential landscape and visual impacts. The current context was understood prior to conducting the site visit, which involved a study of the existing environment in terms of topography, land cover, land use and vegetation type. Other relevant documents and resources such as that mentioned under Sections 9, together with the viewshed analyses (the outer boundary showing the view catchment) formed the basis for the site visit. The five individual viewsheds consisted of the PV panels and BESS. Potential visual receptors were also identified.

The terrain information was derived from the Advanced Land Observation Satellite (ALOS) 30 data, which became available to the general public in 2015/16. The base topographic data is from MapIT South Africa, 2015. Both these data sets are of very good quality. The desktop study included a study of the existing environment in terms of topography and landcover data information from the South African National Land-Cover (SANLC) 2018 raster dataset is based primarily on the new gazetted land-cover classification standard (SANS 19144-2) with 73 classes of information and is available on an open license agreement. It is of excellent quality.

11.2.2 Site visit

A site visit was undertaken on the 16th of March 2023. The site visit included a drive around the surrounds to determine the visual context within which the proposed infrastructure is to be developed. Areas of potential important observation points (as discussed in this report) were assessed and recorded by making use of a hand-held Global Positioning System (GPS) device to confirm these viewpoints and potential sensitive receptors. High resolution, geo referenced photos was taken from KOPs within the study area towards the proposed infrastructure. Other photos, which represent the sense of place, land use and specific landscape character types were also captured during the site visit.

11.3 Description of the affected environment

11.3.1 Baseline phase

11.3.1.1 Establishing the landscape baseline

The landscape baseline aims to provide an understanding of the landscape that may be affected and was established through a desktop study and a site visit (as indicated in the sections above) which identifies and records the character of the landscape, the elements, features, aesthetic, and perceptual factors as well as the value attached to it. The landscape baseline will be established through the landscape character, landscape value, landscape quality, Visual Absorption Capacity (VAC), visual intrusion, and sense of place.

11.3.1.2 Establishing the visual baseline

The aim of the visual baseline is to establish the area in which the development may be visible, the different groups of people who may experience views of the proposed development, the places where they will be affected, the nature of the views and the visual amenity at these points. The visual baseline was established through identifying the visibility and visual exposure, the visual receptors and the KOPs (which were confirmed during the site visit).

11.3.2 Assessment phase

11.3.2.1 Assessment of landscape impacts

An assessment of landscape effects deals with the effects of change and development on the landscape as a resource. The Study Area was considered and includes the site itself and the full extent of the wider landscape around it, which the proposed development will influence in a significant manner. This was based on the maximum extent of the area from which the development is potentially visible, defined as the viewshed or ZTV as described earlier.

11.3.2.1.1 Predicting landscape impacts (effects)

Once the baseline information regarding the landscape is established and confirmed this can be combined with understanding of the details of the proposed development to identify and describe landscape impacts (effects), the initial step was to:

- Identify the components (individual elements or key features) of the landscape that are likely to be affected by the scheme (landscape receptors).

The second step was to:

- Identify interactions between the landscape receptors and the different components of the development during all the different project stages; and
- Direct as well as cumulative impacts (effects) will be included.

11.3.2.1.2 Assessing landscape impacts (effects)

The identified landscape impacts (effects) will be assessed to determine their significance.

Assessment was based on:

- Sensitivity of landscape receptors (determined through the VAC and overall susceptibility to the type of change);
- Value of the landscape receptor (landscape character type/s and individual elements and features contributing to landscape character); and
- Severity (magnitude) of landscape impacts (effects) related to size, scale, geographic extent, duration, and reversibility of landscape effects.

11.3.2.2 Assessment of visual impacts

The assessment of visual impacts (effects) deals with the effects of change and development on the views available to people and their visual amenity.

11.3.2.2.1 Predicting visual impacts (effects)

Likely impacts (effects) on potential visual receptors were identified, to determine these impacts, the following was considered:

- The nature of the view (full or partial);
- The proportion of the infrastructure which will be visible;
- The distance of the viewpoint to the proposed development; and
- Whether the view is stationary or transient

11.3.2.2.2 Assessing visual impacts (effects)

The identified visual impacts (effects) were assessed to determine their significance. The assessment was based on:

- The sensitivity of visual receptors (susceptibility of visual receptors to change, mainly based on the occupation or activity at a specific viewpoint and the extent to which their attention may be focused on the view);
- Value attached to the views; and
- Severity (magnitude) of the visual effects related to size/scale, geographical extent, duration, and reversibility of visual effects.

11.3.2.3 Assessing cumulative landscape and visual impacts

Cumulative landscape effects can affect either the physical fabric or character of the landscape. Cumulative visual impacts can be caused by combined visibility, which occurs where the receptor is able to see two or more developments from one viewpoint and/or sequential effects which occur when the receptor must move to another viewpoint to see different developments. Types of cumulative landscape and visual effects includes:

- Extension to an existing development;
- Filling of an area with similar types of development;
- Interactions with different types of development;
- Incremental change because of successive individual developments; and
- Landscape and visual impacts (effects) resulting from future actions;

11.3.2.4 Mitigation of landscape and visual impacts

Possible impacts (effects) were identified which include siting, access, layout, and structures.

General forms of visual mitigation include:

- Prevention/avoidance;
- Reduction by means of:
  - Adjustment of site levels;
  - Use of appropriate form, detail design, materials and finishes where it is not desirable or practical to screen;
- Alterations to landform together with structured planting;
- Avoiding or reducing obtrusive lighting, consideration was given to different ways of minimising light pollution; and
- Offset, remedy, or compensate.

11.4 Approach

Figure 7 provides a diagrammatic assessment approach of the Landscape and Visual Assessment:

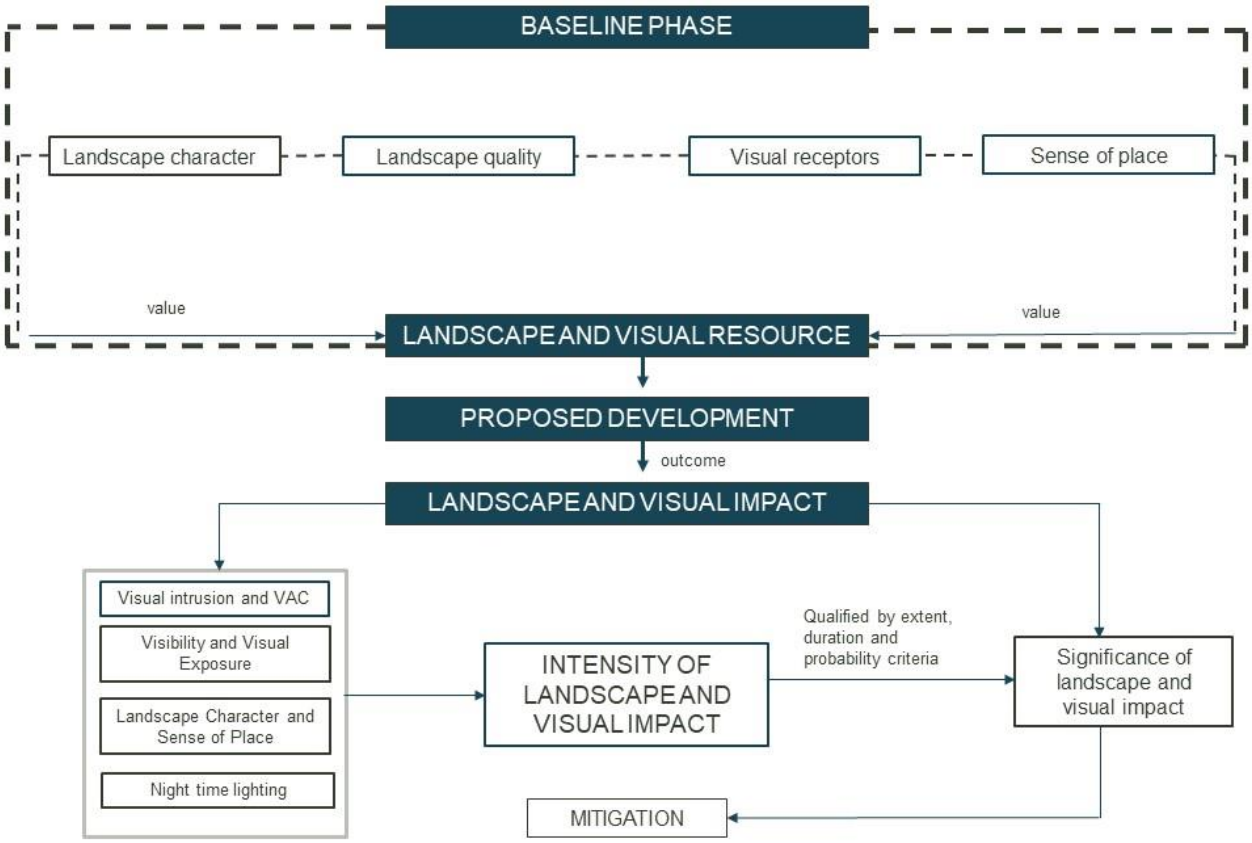


Figure 7: LVIA assessment methodology

12 Description of the proposed project

12.1 Project design

Figure 8 shows the proposed conceptual project layout available at the time pf preparing this report. The black block represents the arrays of solar panels. Note that other components shown in this figure (e.g., transmission lines) do not form part of the development for which environmental authorisation is sought as they are existing lines.

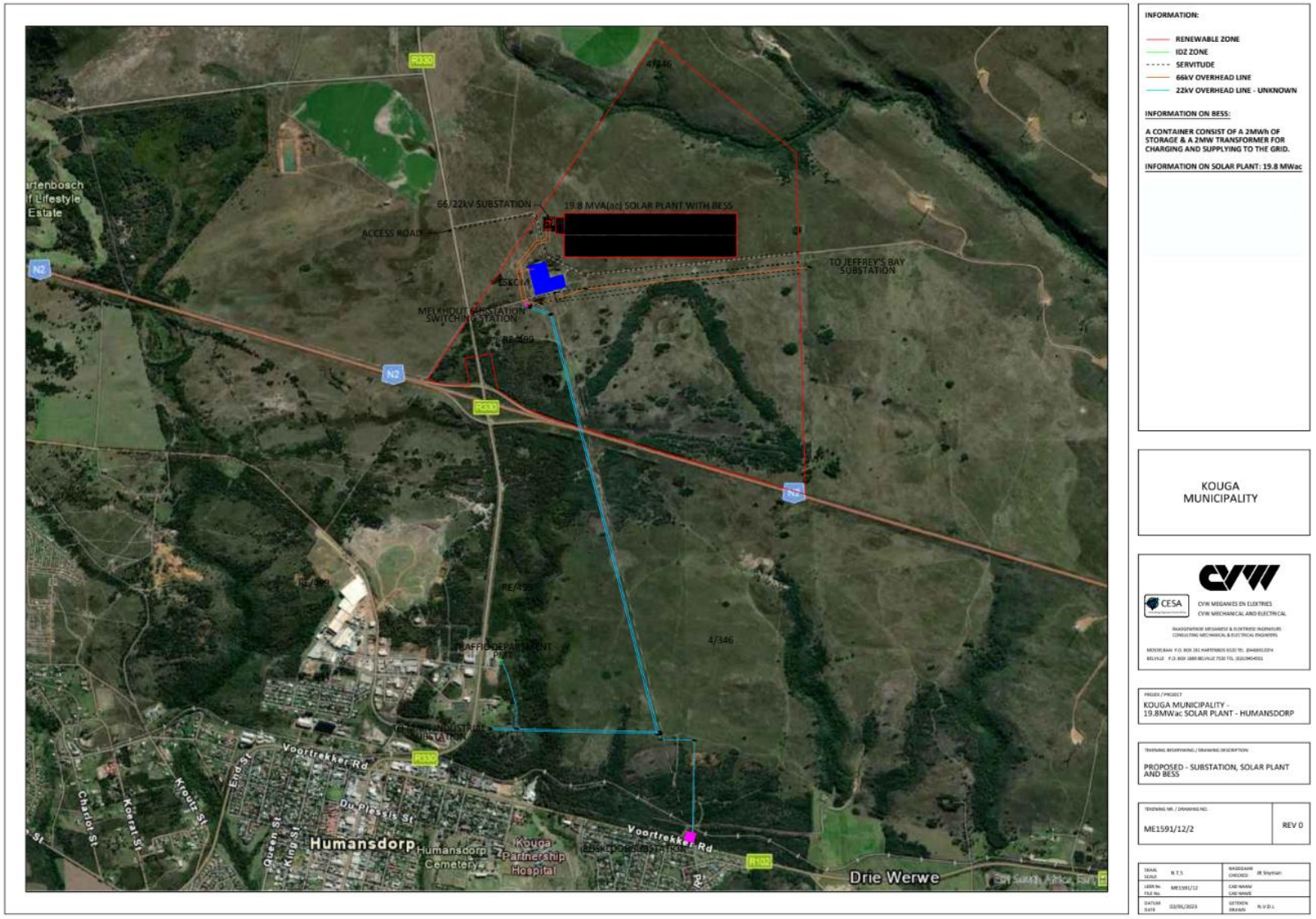


Figure 8 Project layout

12.2 Project components

Key technical information applicable to this study is listed in Table 5 below:

Table 5: Technical information

Item	Applicable technical information
Power plant technology	Ground mount solar PV plant (~19.8 ha)
Solar modules	Crystalline-silicon PV technology
Structure /mounting	The PV solar modules will be installed on tracking tables which, in turn are mounted on steel supports and arranged on the site along a north-south axis. The panels rotate through the day, facing east in the morning and rotating to west in the afternoon. This is a typical arrangement for ground-mounted solar PV installations.
Inverter stations	Blocks of the above-mentioned panels will be connected to inverter stations (containerised), and a direct current (DC) combining box will be located at each of the inverter stations which will be a 2.6 m high cube container mounted on a concrete stand. Refer to Figure 12.
Battery Energy Storage System (BESS)	Lithium-ion batteries are stored in shipping containers, which are closely spaced on the side of the solar panel arrays (see Figure 11).
Access and internal roads	The existing dirt road from the R330 to the adjacent Eskom substation will be used to access the proposed facility. The access roads will be 6.8m wide gravel roads.
Ancillary infrastructure: – **Permanent guard house** – **New fence** – **Internal roads** – **Civil services**	 Approximately 3m high (will not exceed 1 storey) close to the existing Eskom substation. Around the perimeter of the site. 3.4m wide, will be constructed to give access to the solar panels for performing maintenance. Water and power supply. (Municipal power and water will be trucked in as needed, portable chemical toilet for guard house).
Project life cycle	The PV Facility is not currently planned to be decommissioned. However, the typical effective life of solar panels is 20 to 25 years, after which they may be replaced with new panels to extend the life of the facility.

Figure 9: Single access tracking structure tables

Figure 10: A view of installed single access tracking structures

Figure 11 Appearance of a typical BESS[2] (left)

Figure 12: Typical inverter container

From a visual perspective, single axis tracking systems, with maximum heights less than 5 m above natural ground level, result in less visual impacts than the taller dual axis tracking systems, which can reach heights of up to 8m.

[2] https://www.energy.gov/eere/solar/solar-integration-solar-energy-and-storage-basics

12.3 Alternatives

12.3.1 Site alternatives

Numerous sites were considered during the pre-feasibility study phase of the project. However, only the current site was deemed suitable for the proposed project. The current site is the preferred site and the only feasible site alternative to be investigated in the Basic Assessment, as it borders the electrical connection point into the local grid (Melkhout Switching Station), is adjacent to a renewable energy facility (wind farm), and the land is owned by the Municipality.

12.3.2 Land use alternative

No alternative land use and activity alternatives have been considered in this report.

12.3.3 Technology alternatives

Two mounting options were considered during the pre-feasibility of this project, namely fixed structure and the tracking system. The tracking system is the proposed and preferred technology as it will give greater return on investment and provide greater efficiency (i.e., results in higher electrical output), particularly during the early morning and late afternoon when the sun is low on the horizon. As such the fixed structure is no longer considered feasible and will not be discussed any further

12.3.4 Layout alternatives

Only the layout provided in Figure 8 was considered.

The project will use an existing dirt access road from the R330 to the adjacent Eskom substation. No other access alternatives with lesser environmental or visual impact need to be considered, since the access road already exists.

12.4 Project phase activities

The table below is a summary of typical activities associated with the different phases of the proposed project.

Table 6: Anticipated project phase activities

PROJECT PHASE	SUMMARY OF ASSOCIATED ACTIVITIES
Construction phase Estimated time duration: 1-2 years	• Clearing and grubbing. (No broadscale topographic levelling is planned); • Construction of internal access routes; • Preparation and use of material and equipment laydown areas; • Placement of solar collectors; • Construction of the electrical switching station; • Construction of the BESS; and • Disturbed areas, other than the internal roads and areas used for maintenance, will be revegetated after construction.
Operational phase Estimated time duration: 20-30 years	• Operation of the solar facility to produce power; • Regular monitoring and maintenance activities to ensure safe and consistent operation; • Maintenance of access roads; and • Vegetation maintenance within the solar collector field.
Decommissioning phase	• The PV Facility will not be decommissioned.

13 Description of the affected environment

This section of the report describe the appearance and value of the existing landscape, including aspects of the natural, cultural, and scenic landscape. The sections below describe the character, uniqueness, intactness, quality, rarity, and vulnerability of these features.

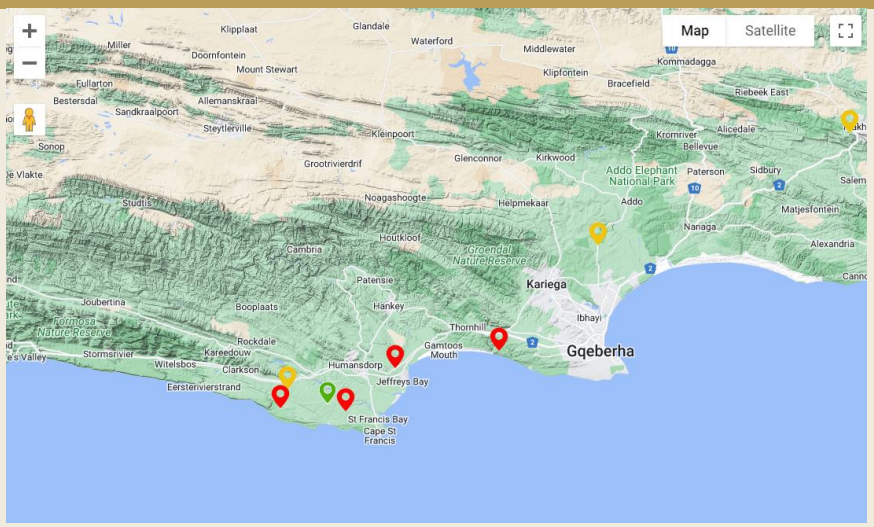
13.1 Landscape baseline

Table 7: Summary of the landscape baseline

Landscape perimeter	Description
Climate	The region where the proposed development is situated experiences all season rainfall, although most precipitation peaks during March and October. Mean annual precipitation (MAP) for the vegetation unit, Kouga Grassy Fynbos, is between 560 and 890mm. Mean daily minimum and maximum temperatures for February and July are respectively 25.2°C in February and 7.6°C in July. Frost occurs on average 3 times per year (Mucina and Rutherford, 2006). The vegetation of the study area appears the same throughout the year. The vegetation is dominated by dark colours, including green, grey, brown and a combination of these colours. The vegetation's colours are generally muted, with occasional bright colours of wildflowers.
Topography	The site is located on a low coastal plain with a general height above sea level of 150 to 250m. This plain drops down in the east towards the Gamtoos River, which flows into the sea approximately 11km east, northeast of Jeffreys Bay. To the south of the coastal plain, mountains of the Cape Folded Belt rise to heights of between 500m and 1000m above sea level and form an almost continuous belt of higher-lying land. The SEF itself is located on the low plain at an altitude of approximately 220m above sea level and has very limited topographical variation.
Vegetation cover	The study area falls within the Fynbos Biome. Fynbos is a shrubby vegetation type of low height and is generally treeless or has very sparse tree cover. According to Mucina and Rutherford (2012), the proposed site for the proposed solar SEF falls within the Kouga Grassy Fynbos vegetation type, which is described as a low shrubland with sparse, emergent tall shrubs, dominated by grasses in the undergrowth, or grasses with scattered ericoid (Erica-like) shrubs. This vegetation type is naturally treeless on the plains, with only riverine areas and mountain slopes and valleys having dense trees cover. Considering the low height of natural vegetation, it will not provide any form of screening for the proposed plant. However, dense stands of Black Wattle (*Acacia mearnsii*) occur between the proposed SEF and the N2 south of the site. These trees, although invasive and exotic, provide very effective visual screening of the plant from Humansdorp. Refer to Figure 16 for an example of the natural vegetation type found within the study area.

Landscape perimeter	Description
Landcover	The site is surrounded by a mix of land cover types. The main land cover category on the site and in its immediate surroundings is low shrubland (fynbos), which is used for extensive farming. South of the N2 are large areas used for crop cultivation for dairy farming. These areas are cleared of natural vegetation and have extensive areas of planted pasture. The area used for this land use covers a vast region, orientated from the east near Jeffreys Bay to Humansdorp and west of this town. The N2 highway and the R102, which runs parallel and south of it, mark the dividing line between dairy farming areas to the south and the naturally vegetated areas to the north. The region includes relatively small urban areas, including the town of Humansdorp – the closest town to the proposed PV SEF site.
Landscape character[3] **(Refer to Appendix B1 for a detailed description of the landscape character)**	The landscape character of the study area can be described as primarily rural. As indicated above, the area south of the N2 and R102 is intensively farmed for dairy production, whilst the areas to the north have a more natural appearance, as vegetation clearance has been limited. Prior to the arrival of renewable energy projects in the region, the area was dominated by farming activity. However, in the past decade, the coastal area between Gqeberha (formerly Port Elizabeth) and the St. Francis Bay area has become a hub for the development of wind energy facilities. The result is that major portions of the landscape, particularly on higher-lying areas, are dominated by large wind turbines with hubs up to 100m high and blades up to 80m long. The wind energy facilities in this landscape typically consist of clusters of 20 to 30 turbines per facility. Five wind farms with capacities between 80 and 147 MW each have been established in the area around Jeffreys Bay and St. Francis Bay. Perceptions of these turbines varies widely, with some people expressing positive sentiments regarding the generation of renewable energy, while others regard the turbines as industrial eyesores. Irrespective of the perception of their visual influence, these imposing structures are very visible in the landscape, even over distances of tens of km.

[3] *Landscape character is a distinct, recognisable, and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse. Landscape character includes the natural and man-made attributes of the study area, including topography, land cover and vegetation. The overall landscape character is influenced negatively by incompatible activities, or positively by the presence of natural and/or man-made features, such as steep gradients, presence of rocky ridges, natural vegetation, pans, and floodplains.*

Landscape perimeter	Description
	 *Figure 13: Location of Wind Energy Facilities within the study area[4]* The major tourism centres in the area are Jeffreys Bay, St. Francis Bay and to a lesser extent the much smaller Oyster Bay. All these towns have a focus on beach holidays and have a wealth of accommodation establishments. Their tourism value is based on views to the sea, which are orientated east and south, away from the SEF site. Humansdorp serves primarily as an agricultural service centre, with limited small industry south of the town. Its industrial buildings are visible over several km from the coastal plain south of the town (see Figure 17). The site is vacant with areas dominated by low-growing fynbos. The areas adjacent to the site are dominated by transmission lines along its southern boundary and the existing Eskom substation on the western side. There are several transmission and distribution powerlines that run between this substation and towns or wind energy facilities in the region. Despite the high degree of visibility of the wind energy facilities, they, by and large leave the existing natural vegetation untouched, except the turbine bases and access roads between the turbines.
Visual absorption capacity (VAC)[5] and visual intrusion **(Refer to Appendix B2 and B3 for a detailed description of the VAC and visual intrusion)**	The natural topography alone offers little screening ability due to the low height of the natural fynbos vegetation. However, the solar panels, being dark blue to black in colour, will have a low level of contrast with the natural vegetation. If as much as possible natural fynbos vegetation is left between the rows of solar panels, contrast between the solar panels and vegetation will be limited. However, if large scale removal of vegetation takes place before construction, then high contrast would occur, due to the light colour of the sandy soil.

[4] https://sawea.org.za/wind-map-2/

[5] VAC is an indication of the ability of the landscape to visually conceal the proposed development. Areas with high VAC can accommodate and absorb physical changes in the landscape without transforming its visual character and quality, while a low VAC rating implies a low ability to absorb or conceal visual impacts (Oberholzer, 2005). The factors that contribute to the VAC factor includes topographical diversity, vegetation, soil contrast, visual pattern, and recovery time.
VAC is further closely related to visual intrusion, which refers to the physical characteristics and nature of the contrast created by a project on the visual aspects of the receiving environment. It is also, as with VAC, a measure of the compatibility or the conflict of a project with the existing landscape and surrounding land use.

Landscape perimeter	Description
	Were it not for a dense stand of exotic trees along the southern boundary of the site (between the site and the N2), the overall VAC of the site would be considered low. These trees provide very effective screening of the project and increase the VAC of the site to high. The site is highly visible only from the north. Considering the abundance of industrial elements like transmission lines, a substation and wind turbines at and close to the site, there is already a high degree of visual intrusion from infrastructure with an industrial appearance. Hence, the additional presence of the proposed solar arrays will add a small degree of visual intrusion over and above what is already present. Besides the wind turbines and electrical transmission lines, large expanses of light-coloured shade netting over orchards in the Gamtoos River valley adds further existing contrast to the dark-coloured vegetation in the region (Figure 15). Minimal visual change is expected as the proposed infrastructure is similar in nature to these existing (and much higher) infrastructure elements. The landscape offers visual variety and discontinuity in terms of lines, forms and colours, most of which is associated with electricity infrastructure.
Landscape Quality[6] **(Refer to Appendix B4 for a detailed description of the landscape quality)**	The landscape associated with the study area provides minimum topographical variety. The coastal plain on which the proposed development will be located has little topographical variety. The highest topographical variety in the region occurs within the Gamtoos River valley and the coastal area or Jeffreys Bay, St. Francis Bay and Cape St. Francis. Both Jeffreys Bay and St. Francis Bay have long expanses of beach, which are their primary tourism assets. The rocky cape, Seal Point lighthouse and expansive vegetated dune landscapes at Cape St. Francis adds further visual interest and variety. The landscape west of Cape St. Francis is rocky and jagged, with contrasting shifting dunes, sparsely vegetated dunes and forested inter-dune slacks. And has the most wilderness-like appearance in the coastal region. The Kromrivier and its wide estuary north of St. Francis Bay also provides a prime tourism asset and is distinguished by the colours of the shallow water, the placid water surface and the densely vegetated fringes around the estuary. St. Francis Bay is also well known for its unified architectural theme of white walled houses with traditional thatch or dark coloured roofs, together with its system of coastal canals. The combination of these features gives the town a unique tourism quality. Humansdorp has a more utilitarian and industrial character, due to the presence of tall industrial buildings and large informal settlements around the town. The visual quality of the area north of Humansdorp is further reduced by the cluster of electricity infrastructure (Eskom substation, transmission corridors and wind turbines).

[6] Landscape quality is based on human perceptions and expectations in the context of the existing environment. A landscape's visual quality is therefore a factor of an observer's emotional response to physical landscape characteristics and therefore assigning values to visual resources is therefore a subjective process. Landscape quality increases with the presence of water, topographic ruggedness and where diverse patterns of vegetation occur. Areas that contain more natural features or harmonious man-made compositions will have a more favourable landscape quality than areas with non-harmonious human activity.

Landscape perimeter	Description
Landscape Value[7] **(Refer to Appendix B5 for a detailed description of the landscape value)**	The coastal portions of study area are likely to be most valued by tourists who come to the region for the coastal scenery and amenities. The study area is also likely to be moderately valued by residents residing in nearby settlements and farm workers. The proposed project may lower the landscape value through the direct loss of vegetation, especially during the construction phase of the project. The residents of and visitors to St. Francis Bay and Jeffreys Bay are likely to attach the highest value to undisturbed natural landscapes. Due to the existing industrial nature of the environment at Humansdorp, residents and workers in these areas are likely to attach less value to natural landscape, and will be affected to a lesser extent by the addition of another industrial element like a solar PV facility.
Night-time lighting[8] **(Refer to Appendix B6 for a detailed description of night-time lighting)**	The proposed study area has medium district brightness as it falls within a rural area close to existing large-scale infrastructure such as the existing Eskom substation, which has extensive security lighting. This is the primary source of lighting in the area, as the town of Humansdorp is located 2km south of the site. However, lighting at the industrial facilities on the northern side of Humansdorp will add light pollution to the night-time sky. It is expected that the proposed infrastructure will not add significantly to additional night-time lighting in the area during the operational phase of the project. However, best practice measures to decrease the lights at night has are listed under section 14.3 of this report.
Sense of place [9]	The sense of place associated with the specific site and its surrounds can be described as rural and industrial with a moderately active level of traffic. Intensive agriculture dominates the scenery south of the N2, and extensive agriculture (grazing of natural vegetation) dominates the scenery north of the N2. This natural scenery is punctuated north and east of the proposed site by wind energy facilities and their associated transmission lines.

[7] Landscape value is concerned with the relative value attached to a specific landscape by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons. Value can apply to areas of landscape as a whole or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the character of the landscape (IEMA, 2013). In determining landscape value, the people, or groups of people who could be affected by the proposed development should be considered, due to landscape being valuable to people in different ways.

[8] To determine the potential visual impact of night-time lighting, it is important to understand the existing lighting levels within the study area. The Institute for Lighting Professionals (ILP) 2011 identifies five environmental zones for exterior lighting control, describing the existing lighting conditions within the landscape. These zones are supported by design guidelines to reduce lighting pollution, which can inform mitigation measures.

[9] Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or viewer. It is created by the land use, character, and quality of a landscape, as well as by the tangible and intangible value assigned thereto.

Figure 14: View looking north of the Gamtoos River Valley east of the site, with extensive dairy pastures in the background

Figure 15: Fruit orchards in the background covered by contrasting light-coloured shade netting in the Gamtoos River Valley, contrasting with dark, muted colours of natural vegetation in the foreground.

Figure 16: General view of muted colours and low growing nature of natural fynbos vegetation within the study area

Figure 17: Tall, light-coloured Industrial buildings of Humansdorp visible in the background from the R330, looking north (approximately 10km south of Humansdorp). Dairy pastures are visible in the foreground.

Figure 18: View from the N2 of the Jeffreys Bay Wind Farm adjacent to (east) of the proposed site, showing light coloured wind turbines that contrast with the dark coloured mountains in the background

Figure 19: Transmission pylons south of the site (right hand side) with wind turbines in the background, looking east from the southern boundary of the site

Figure 20: View of low-growing natural fynbos vegetation and a rocky outcrop on the site, looking west

Figure 21: View of the site looking south towards a dense group of exotic trees in the background between the site and the N2

Figure 22: View west along the N2 from the N2 / R330 interchange adjacent to the site, showing the low coastal plain on the left (south) and the mountains to the right (north)

Figure 23: View of the existing Eskom substation and associated transmission lines adjacent to the site

Figure 24: Views towards the site looking west along the access road, showing numerous transmission lines

Figure 25: Clusters of transmission lines from the existing Eskom substation adjacent to the site

Figure 26: Access point to the site from the R330

Figure 27: Panoramic view towards the site looking north from the R330, across planted pastures in the foreground

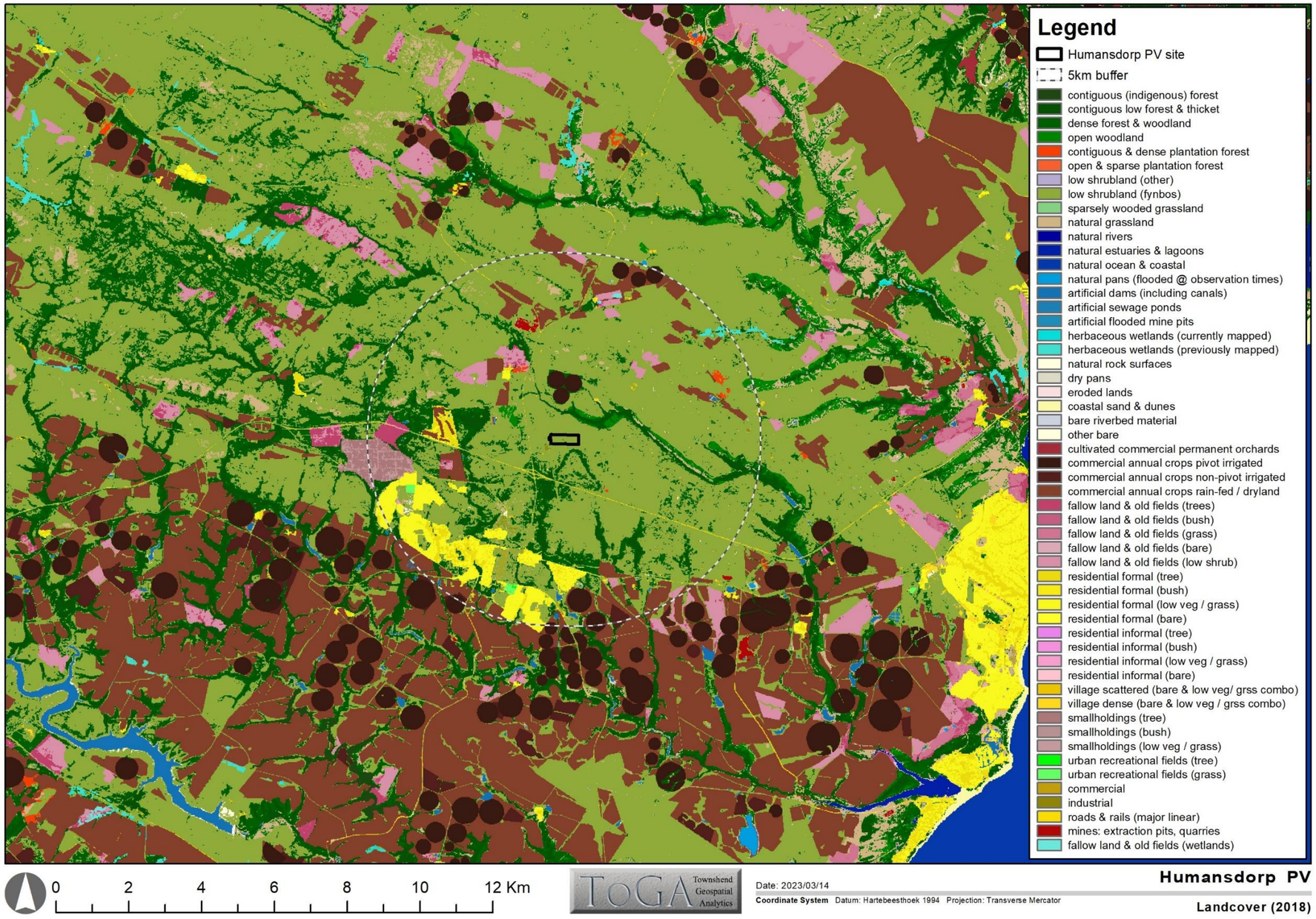


Figure 28: Landcover of the study area

13.2 Visual baseline

13.2.1 Main visual receptors

During the site visit potential visual receptors and their sensitivity were identified and indicated in Table 8 below. Their sensitivity will be dependent on the location, the activity of the viewer and the importance of the view. Receptor locations are not only stationary but can also be roads along which people travel. Appendix B7 provide further information on receptor sensitivity.

Table 8: Visual receptors

Visual receptors	Description (sensitivity of receptors)
Local motorists driving along main roads such as the N2, R330 and R 102	Motorist on the N2 and R102 (which run in east to west directions south of the site) will have low sensitivity, as they are focused on driving and they will have a narrow cone of vision, except when they slow down at intersections such as the N2 / R330 interchange. This group of people comes into regular contact with the specific landscape for work related purposes and have grown used to the ongoing mine/industrial type changes within it.
Tourists driving along the R330 to or from St. Francis Bay (travelling to or from the beach or tourism accommodation)	High sensitivity. The motorists' attention and interest are focused on the landscape.
People residing permanently in the study area and close to the site. This includes residents of Humansdorp and its surrounding townships.	Moderate sensitivity. These motorists most likely make daily trips on the roads into and out of Humansdorp, and would probably have grown accustomed to the semi-industrial nature of the town and related infrastructure. However, they will most likely still attach a moderate value, not necessarily to aesthetics but rather to open, undeveloped landscapes close to town.

Receptor sensitivity will vary between high (tourists traveling to or from accommodation or tourism assets) to low (workers traveling to and from their place of work). It is expected that the number of high sensitivity receptors will be significantly less than those with expected low – moderate sensitivity during the tourism off-season but would be higher during the peak tourism seasons (December to January and other school holidays).

13.2.2 Visual exposure and visibility

Visual exposure and visibility are further explained in Appendix B8. Since no transmission lines are planned for the proposed solar PV facility, only the impacts of this facility has been modelled and transmission lines have not been considered as the facility will have a short 66kV line connecting to the adjacent Melkhout switching station.

According to the viewshed analysis (based on topography) the proposed infrastructure will have high visibility within a range of 1 to 1.5km of the site, up to the N2 south of the site and the R330 west of the site. Visual exposure drops to zero in a river valley that runs east to west

less than 1km north of the site. Since the N2 runs on a low ridge, and topography drops from an altitude of around 220m above sea level at the site to around 135m above sea level at Humansdorp. Most of the town is located at the bottom of the low escarpment that separates these levels, except the industrial area of town, which is situated at a higher level above (north of) the town. Due to this difference in altitude, the proposed solar PV facility will not be visually exposed to Humansdorp, even from the industrial parts of the town.

Visibility drops of to virtually zero more than 3km from the site. Publicly accessible areas that would theoretically have the highest visual exposure (based only on topography) include a portion of the N2 within 1km east and west of the N2 / R330 interchange, and the R330, 2km north of this interchange. However, the proposed infrastructure will not be visible from the N2 as views to the site are blocked by the dense group of trees between the N2 and the site. Thus, the proposed infrastructure will not be visible from the N2 at all. The most visible features from the N2 are the wind turbines east of the site, as they extend above the height of the trees.

At distances further than 3km visual exposure drops to zero. The proposed project will not be visible at all from tourism hubs like Jeffreys Bay and St. Francis Bay, as these are located more than 10km from the site. At that distance, only large infrastructure such as wind turbines adjacent to the site are visible.

The most important and prominent views towards the PV arrays will be from the R330 west and north of the site as motorists approach Humansdorp from the north, since the topography of this area is flat, and vegetation is either very low planted pasture or low-growing fynbos. Views from here will not be obscured by existing infrastructure.

From these vantage points, the PV panels will appear as a linear dark element in the landscape if viewed from the same level, as the array and solar panels read as one. In addition to weather conditions, the visibility of this dark line will depend on the extent of the screening vegetation as well as the distance between the viewer and the edge of the array. The degree of clearance of vegetation will also affect the visibility of the PV arrays. The greater the level of clearance, the more the dark panels will contrast with the surroundings. Keeping vegetation between the panel rows will result in less visibility.

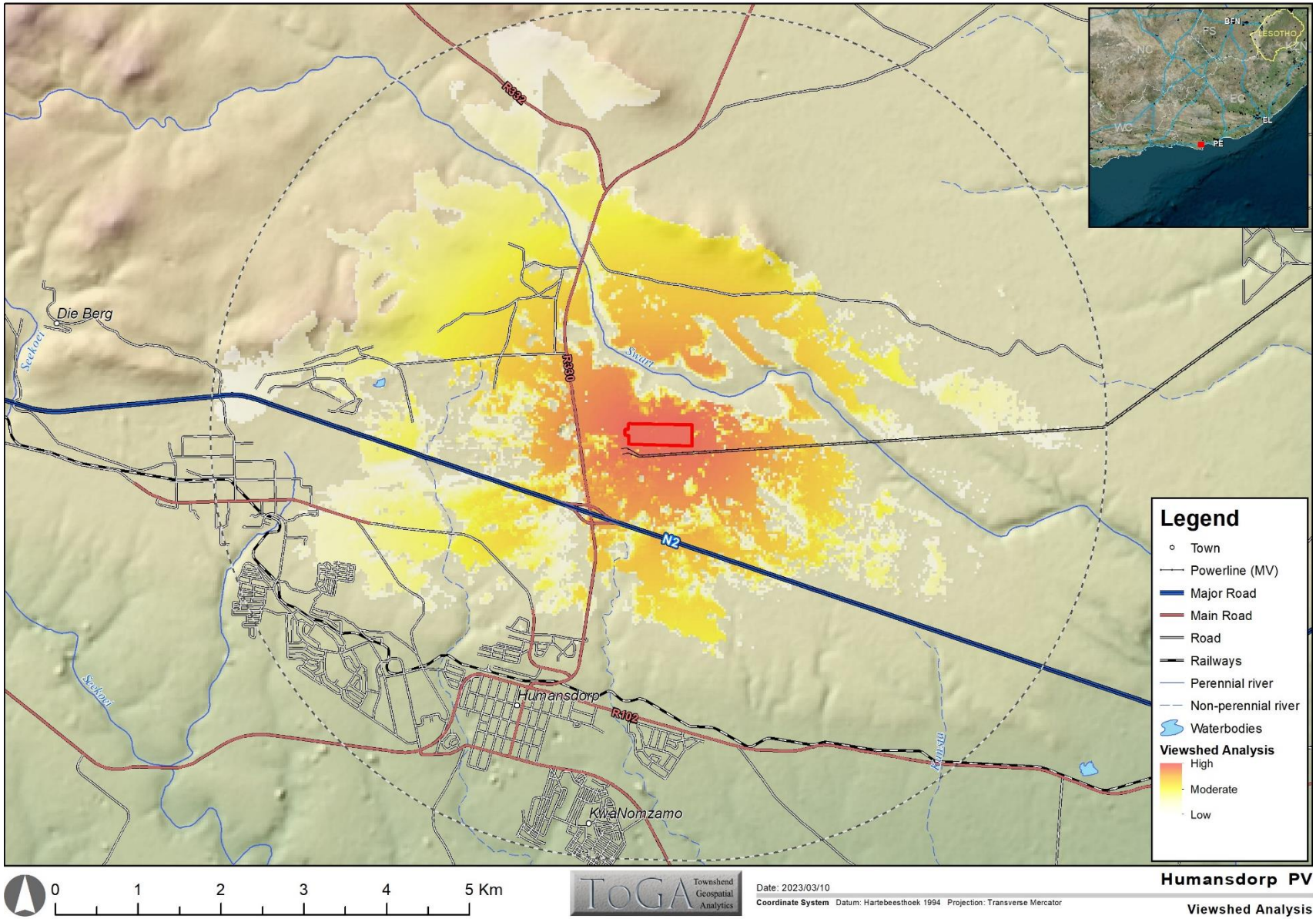


Figure 29: Viewshed analysis of PV panels

13.2.3 Key observation points

Table 9 indicates the KOPs identified during the site visit and based on the criteria as discussed under Appendix B9.

Table 9: Key observation points

KOP	GPS Location	Visibility (Appendix B8)	Receptor sensitivity	Nature of the view	Transient or Stationary	Applicable infrastructure/ Comments
1	34.006200° S 24.779555° E The N2 / R330 interchange	No visibility	**Moderate** Users of the N2 and R330 include local residents travelling between Humansdorp and surrounding towns, and tourists passing through the area.	Partial	Stationery	Views blocked by trees between the N2 and the site. Other electrical infrastructure (wind turbines and transmission lines) is visible, as they extend above the height of the trees.
2	34.014815° S 24.804080° E The N2 southeast of the site	No visibility	**Moderate.** Users of the N2 include local residents travelling between Humansdorp and surrounding towns, and tourists passing through the area.	Zero	Transient	Views blocked by trees between the N2 and the site. Other electrical infrastructure (wind turbines and transmission lines) is visible, as they extend above the height of the trees.
3	33.995142° S 24.778014° E The R330 northwest of the site.	No visibility	**Moderate**	Full	Transient	This is the only KOP that has direct line of site of the proposed plant location. However, the distance to the site (600m) mitigated the impact, and the solar PV plant will be viewed against the background of the existing substation and transmission lines.
4	34.09358° S 24.800059° E	No visibility	**High** Tourists travelling between Humansdorp and St. Francis Bay travel this route. Motorists	Zero	Transient	The site is more than 10km from the KOP. Large industrial buildings at Humansdorp and wind

KOP	GPS Location	Visibility (Appendix B8)	Receptor sensitivity	Nature of the view	Transient or Stationary	Applicable infrastructure/ Comments
	R 330 between St. Francis Bay and Humansdorp		travelling in a northerly direction look towards the site.			turbines dominate the view in the background.

Figure 30: KOP 1_View towards the site from the N2 looking west, showing a dense group of trees in the background that screens views towards the site

Figure 31: KOP 2_Panoramic view towards the site, looking northeast from the top of the N2 / R330 interchange.

Figure 32: KOP 3_View towards the site looking southeast from the R330

Figure 33: KOP 4_View towards the site looking north along the R330 between St. Francis Bay and Humansdorp

13.2.1 Solar reflection

The term 'solar reflection' is used in this report to refer to both reflection types i.e., glint[10] and glare[11]. As mentioned under Section 10 ,a separate detailed solar reflection study did not form part of the scope of works and this section is a general overview based on various international studies. Reflections will be west, northwest, northeast and east and reflections are generally not possible directly north and south. Therefore, there is a slight potential for reflection to occur for road users on the R330 west of the site. There are no visual receptors east of the site, as the area east of the site is occupied by a wind energy facility. Solar PV panels absorb solar energy as far as possible, thus limiting light reflection. Hence, it is not expected that glare and reflection from the solar PV plant will be noticeable.

This conclusion is supported by The Federal Aviation Administration (FAA) Guidance "*Technical Guidance for Evaluating Selected Solar Technologies on Airports* ", which includes a table comparing the reflectivity of solar panels and other surfaces. Surfaces in this figure produce reflections which are specular[12] and diffuse. Diffuse reflection will reflect the incoming light and scatter it in many directions. A table of reflectivity values, sourced from the figure within the FAA guidance[13], is presented below.

Table 10: Relative reflectivity of various surfaces[14]

Surface	Approximate percentage of light reflected[15]
Snow	80
White Concrete	77
Bare Aluminium	74
Vegetation	50
Bare Soil	30
Wood Shingle	17
Water	5
Solar Panels	5
Black Asphalt	2

An important comparison in this table is the comparison of the reflectivity of solar panels to that of water. Both produce reflections of very similar intensity. A study by Riley and Olsen (2011) as mentioned by Frolic, K. also concludes that still water has a very similar reflectivity to solar panels. **Therefore, in the case where solar reflectivity is geometrically possible, the impact of this is not expected to be significant**.

[10] A momentary flash of bright light typically received by moving receptors or from moving reflectors.
[11] A continuous source of bright light typically received by static receptors or from large reflective surfaces.
[12] Specular reflection, or regular reflection, is the mirror-like reflection of waves, such as light, from a surface.
[13] FAA, November (2010): Technical Guidance for Evaluating Selected Solar Technologies on Airports.
[14] http://www.faa.gov/airports/environmental/policy_guidance/media/airport_solar_guide_print.pdf
[15] Extrapolated data, baseline of 1,000 W/m2 for incoming sunlight.

14 Impact Assessment

Potential landscape and visual impacts associated with the proposed solar PV Facility are discussed in the sections below according to the method outlined in Appendix A. Appendix C provides detailed impact tables.

14.1 Main activities

The main activities as identified during the scoping phase which could result in potential landscape and visual impacts are as follows:

14.1.1 Construction phase

- Visual changes as a result of material lay-down areas and construction vehicle use, which may cause dust emissions (limited to spatial and temporal extent) in areas that have been cleared;
- Potential stockpiling of material (if required); and
- Clearance of vegetation for the construction of infrastructure, roads, and storm water infrastructure.

14.1.2 Operational phase

- The erection of the PV panels will change the landscape and visual aesthetics. The change will be small as the solar PV plant has very limited visual exposure from key viewpoints and is not visible at all from residential areas. Although the plant is proposed to be constructed on low-growing fynbos vegetation, which offers no visual screening, the plant is very effectively hidden from view by a large dense group of exotic trees south of the site. This completely blocks views from the N2 road south of the site;
- Since no transmission lines are planned for the proposed plant. Other existing electricity transmission and electricity generation infrastructure (including wind turbines) adjacent to the site are much larger and more visually intrusive than a solar panel array; and
- Although the solar panels may introduce reflection for surrounding farm workers and residents (only to the west of the site, from where the plant will be visible), the distance from the nearest public road (600m) mitigates this impact to a negligible level.

14.2 Landscape impacts

14.2.1 Impact 1: Impact on Landscape character and sense of place

This impact is a change in the landscape character and sense of place of the study area through the addition of industrial-type infrastructure. The proposed development will add to the industrial components in the landscape, resulting in negative changes to the landscape character and sense of place.

Sense of place is the unique value that is allocated to a specific place or area through the cognitive experience of the user or receptor. It is generated by varying combinations of a range of factors including land use, character, and quality of a landscape, as well as by the tangible and intangible value assigned thereto. As such, sense of place is a subjective matter that differs from person to person based on individual backgrounds, experiences, norms, values, and aspirations. While many factors influencing the sense of place are tangible (e.g., increased development, more people, noise, dust), sense of place can also be significantly altered by a change in intangible factors (e.g., socio-cultural norms and values).

The negative impacts caused by a change in landscape character and sense of place cannot be mitigated. Such impacts can only be avoided by a no-go project alternative. However, the natural landscape character and sense of place has already been permanently and extensively altered through the presence of existing electricity generation and

transmission infrastructure (wind turbines, a substation and a large number of transmission and distribution powerlines). The addition of a solar PV facility to the site will not significantly alter the existing impacts of these elements on the existing landscape character and sense of place, since the solar panels are small in comparison to the vertical extent of these other elements.

However, the clearance of vegetation may significantly change the appearance of the ground surface, since exposed light-coloured sandy soil will contrast reflect more light and contrast with the dark-coloured surrounding fynbos vegetation.

CONSTRUCTION/DECOMMISIONING PHASE	
Significance without mitigation	**Significance with mitigation**
Very low negative	Very low negative

OPERATIONAL PHASE	
Significance without mitigation	**Significance with mitigation**
Very low negative	Very low negative

14.2.1.1 Proposed mitigation measures

- Minimise or eliminate large scale vegetation clearance for the proposed plant. This may be achieved either by limiting the width of strips that are cleared for each row of PV panels and leaving natural vegetation between these rows, or by only removing vegetation directly around each PV panel support foundation or driving the support poles directly into the ground (if this is technically feasible) without any vegetation removal. Vegetation growth will be less vigorous than under natural conditions if these recommendations are followed but will nonetheless reduce the contrast and landscape impact.

14.2.2 Impact 2: Impact on visual Intrusion and VAC

The level of compatibility and the ability of the landscape to visually absorb the proposed infrastructure, including contrasts in form, line, colour, and texture resulting from vegetation clearing.

The expected level of visual intrusion throughout construction, operation and decommissioning will be minimal, as the project is situated on a site that has existing large scale electricity infrastructure. The proposed infrastructure will be viewed in conjunction with these existing infrastructure elements, which are much taller and more visually prominent than the relatively low PV panels. Visual intrusion in general is expected to be low for the closest residential areas (e.g., Humansdorp), and non-existent for tourism centres such as St, Francis Bay and Jeffreys Bay. The only area with marginally higher visual exposure is the R330 road north and west of the site.

The study area in general has a low VAC due to the short natural fynbos vegetation, fairly flat plains landscapes and vast areas of treeless planted pasture that have no ability to absorb or conceal most visual impacts. However, the VAC around the site is high due to the dense growth of exotic trees south of the site. This screens the site from the N2, which is the most significant carrier of tourists through the area. The only exception, where VAC for the site is medium, is the area along the R330 north and west of the site.

Limited views to the site are expected within close proximity of the site. The closest publicly accessible area to the site is the R330, 600m west of the site.

CONSTRUCTION/DECOMMISIONING PHASE	
Significance without mitigation	**Significance with mitigation**
Very low negative	Very low negative

OPERATIONAL PHASE	
Significance without mitigation	**Significance with mitigation**
Very low negative	Very low negative

14.2.2.1 Proposed mitigation measures

14.2.2.1.1 Detail design phase

- To reduce visual intrusion, fences must be of a robust mesh type. Shiny galvanized or white coloured fencing must be avoided for permanent security fencing around infrastructure areas. Where practically feasible, the security fence must be offset between any road and a 100m buffer zone must be kept in place to provide a visual buffer between potential receptors and the security fencing (where feasible);

14.2.2.1.2 Construction and operational phase:

- The successful maintenance of vegetation buffers (existing vegetation) can significantly reduce the impact on the landscape. The current PV panel location, in relationship to its distance from main roads and settlements already create an opportunity for effective mitigation;
- After the construction phase, the areas disturbed that are not earmarked for operational purposes (part of infrastructure footprint) must be suitably rehabilitated with fynbos vegetation. The planting of trees and shrubs for screening is not recommended since the fynbos in this area is naturally devoid of trees and shrubs over half a meter tall. Establishment of tree and shrub screens in this area would be an additional source of contrast with the natural landscape.
- Avoid the complete removal of vegetation beneath the solar collector arrays, if vegetation can safely be left beneath the array and does not interfere with facility construction, operation, or maintenance. By implementing this measure colour contrasts associated with exposed or eroded soils can be reduced. Where it is not feasible to leave existing vegetation due to construction, safety, or operational concerns, post-construction revegetation should be considered, consistent with facility operations and safety considerations;
- Make use of the existing access road so that it minimizes modification of the existing topography and additional clearing of vegetation;
- Construction signage should not be obtrusive and should not be seen against the skyline;
- The Contractor shall ensure ongoing housekeeping to maintain a tidy construction area;
- Stockpile heights shall not exceed 3m (natural vegetation will still be able to screen heights lower than 3m);
- Where material laydown areas and construction camps are located adjacent to a road or other existing infrastructure where views from receptors are possible, a 50m natural vegetation (visual buffer) must be maintained between the road and the laydown area or construction camp;
- The Contractor shall not deface, paint, damage or mark any natural feature (e.g., rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand; and

- Maintain as much of the natural vegetation on the ground within the development footprint as practically feasible. Vegetation under solar arrays may need periodic maintenance to maintain an acceptable height and reduce fire risk.

14.3 Visual impacts

14.3.1 Impact 3: Visual exposure and visibility

The visibility and presence of the cleared PV facility associated infrastructure, and transmission lines and the potential solar reflection of the PV panels.

The anticipated visual envelope for the PV panels and BESS will be smaller than indicated in the viewshed analysis, mainly as a result of the screening effects of trees close to the site, and the existing electricity generation and transmission infrastructure. The siting of the PV panels is favourable, approximately 600m away from the R330, and too far from any residential area or tourism asset to affect them. The solar plant is more than 2.5km from Humansdorp's residential areas. The impacts of visibility and visual exposure will not be significant during the operational phase of the project. However, visual exposure and visibility will be more severe during the construction phase due to possible vegetation clearance, signage, and movement (dust) of construction vehicles and machinery. Windblown dust (especially during construction) could obscure views of nearby landscape features and degrade general visibility for local residents, fugitive dust generated during construction will increase the visual exposure.

CONSTRUCTION/DECOMMISIONING PHASE	
Significance without mitigation	**Significance with mitigation**
Low negative	Very low negative
OPERATIONAL PHASE	
Significance without mitigation	**Significance with mitigation**
Very low negative	Very low negative

14.3.1.1 Proposed mitigation measures

Mitigation measures as listed under section 14.2 are also applicable under this section.

The following best practice guidelines are applicable for lighting:

14.3.1.1.1 Construction phase

- Construction activities should be restricted to daylight hours as far as possible, to limit the need for bright floodlighting and the potential for sky glow.

14.3.1.1.2 Operational phase

- Install low level lighting or limit mounting heights of lighting fixtures by utilising footlight or bollard level lights. The use of high light masts and high pole top security lighting should be avoided along the security fence of infrastructure areas. Any high-level masts should be covered to reduce glow and light spillage;
- Use minimum lumen or wattage in light fixtures, where possible and practical;
- Up-lighting of structures must be avoided where possible, with lighting directed downward to illuminate only the immediate surroundings of the infrastructure, thereby minimising the light pollution;
- All buildings must have "full cut off" light fixtures that direct light only below the horizontal;
- Use Yellow Light Emitting Diode (LED) lighting, or equivalent to reduce sky glow. Bluish white lighting is more likely to cause glare; and

- Make use of motion detectors on security lighting at office and Operations and Maintenance Building.

14.4 Cumulative impacts

The proposed development will extend the cumulative effect of industrial development within the landscape. However, it appears that this will not increase to the extent that it will cause significant additional impact on visual receptors in the area.

15 Conclusion

Based on the findings it is evident that the proposed project is in a rural area which is located on a low coastal plain, with limited topographical variation. The natural vegetation of the region is low grassy fynbos, which reaches a maximum height of around 0.5m. The natural vegetation is treeless, apart from coastal areas and those with steep slopes that provide fire protection (e.g., river valleys). The area north of the site towards the mountains is natural vegetated, and used for extensive (grazing) agriculture, whilst the area to the south of the N2 is cleared and is used for dairy agriculture.

The region around the largest settlements (Humansdorp, Jeffreys Bay and St. Francis Bay) is a mecca for the development of wind energy facilities. The presence of these large structures and their associated transmission lines and substations has already affected the quality of the visual landscape. Wind turbines are more than a hundred metres tall and dot the landscape over extensive areas.

Furthermore, the proposed site is directly adjacent to an Eskom substation, with several electricity transmission and distribution lines that radiate out from it. The closest wind turbine is 1.3km east of the site. The presence of this existing infrastructure with an industrial appearance significantly lowers the landscape quality directly around the proposed site.

The region generally has an agricultural sense of place, except for the above-mentioned industrial elements.

The most significant risks to the landscape and visual environment are the impact on visual character and sense of place, impact on visual intrusion and VAC and the impact on visibility and visual exposure. Based on the impact assessment, it was found that the various landscape and visual impacts would generally be low to very low. Proposed mitigation measures would not necessarily decrease the overall impact significance but will decrease the severity. Specific focus should be placed on the maintenance of natural vegetation and the rehabilitation of areas cleared for construction purposes which will not be used during the operational phase of the project. Avoidance of vegetation clearance is a definite priority over later rehabilitation after clearance.

Other considerations include the effective management of dust generation. The impact on landscape character and sense of place cannot be mitigated.

Theoretically the predicted visual impact [based on the Guideline for Involving Visual and Aesthetic Specialists on EIA processes (Oberholzer, 2005)] is expected to be moderate. The assessment of the nature of the development and the sensitivity of the existing landscape and visual environment shows that landscape and visual impact during construction and operation are limited and of low significance. This is based on the following:

- The presence of existing industrial type (electricity transmission and generation) infrastructure has already significantly lowered the landscape quality within the study area.
- The limited height of the proposed infrastructure (generally less than 5m).
- There are no main roads and sensitive, permanent receptors located within the areas indicated under *high visibility* (areas within 2km from the proposed site boundary).
- Most views will be transient; even the transient viewpoints towards the site have effective vegetation screening to avoid the impact.

The proposed development will extend the cumulative effect of industrial type electrical generation and transmission development within the landscape. However, this will not increase to the extent of causing significant additional impact on the landscape and most of the receptors. Should the proposed solar PV facility be authorised, mitigation measures must be implemented to minimise the severity of impacts.

16 References

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Appendix A: Impact Assessment Methodology

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise as a result of the proposed development implementation and place the consequences of the proposed development before the Decision Maker.

For each of the main project phases the existing and potential future impacts and benefits (associated only with the proposed development) were described using the criteria listed in Table A 1 below. This was done in accordance with Government Notice R.326, promulgated in terms of Section 24 of the NEMA and the criteria drawn from the Integrated Environmental Management (IEM) Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the Department of Environmental Affairs and Tourism (DEAT) (April 1998).

The assignment of significance ratings has been undertaken based on past experience of the EIA team, as well as through research. Subsequently, mitigation measures have been identified and considered for each impact and the assessment repeated to determine the significance of the residual impacts (the impact remaining after the mitigation measure has been implemented).

Table A 1: Proposed criteria and rating scales which were used in the assessment of the potential impacts

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the effect of the impact related to the proposed development.
	Negative	
Extent	Footprint	The impact only affects the area in which the proposed activity will occur.
	Project Area	The impact only affects the EIA servitude which extends 50m each side from the proposed centre line and proposed infrastructure footprint.
	Site	The impact affects the area beyond 50m but within 1km from the proposed activity.
	Local	The impact affects the area between 1km – 3km from the proposed activity.
	Study Area	The impact affects the area within 7km from the proposed activity.
	Beyond Study Area	The impact affects the area beyond 7km from the proposed activity.
Duration	Temporary	The duration of the activity associated with the impact will last 0-6 months.
	Short term	The duration of the activity associated with the impact will last 6-18 months.
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years.
	Long term	The duration of the activity associated with the impact will last more than 5 years.
Severity	High negative	The severity of the impact is rated as High negative as the natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.
	Moderate negative	The severity of the impact is rated as Moderate negative as the affected environment is altered but

Criteria	Rating Scales	Notes
		natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected
	Low negative	The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected
	Low positive	The severity of the impact is rated as Low positive as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally improved
	Moderate positive	The severity of the impact is rated as Moderate positive as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are positively affected
	High positive	The severity of the impact is rated as High positive as the natural, cultural or social functions and processes are altered to the extent that valued, important, sensitive or vulnerable systems or communities are substantially positively affected.
Potential for impact on irreplaceable resources	No	No irreplaceable resources will be impacted.
	Yes	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental	A combination of extent, duration, intensity and the potential for impact on irreplaceable resources.
	Highly detrimental	
	Moderately detrimental	
	Slightly detrimental	
	Negligible	
	Slightly beneficial	
	Moderately beneficial	
	Highly beneficial	
	Extremely beneficial	
Probability (the likelihood of the impact occurring)	Unlikely	It is highly unlikely or less than 50 % likely that an impact will occur.
	Likely	It is between 50 and 75 % certain that the impact will occur.

Criteria	Rating Scales	Notes
	Definite	It is more than 75 % certain that the impact will occur, or it is definite that the impact will occur.
Significance	Very high - negative	A function of Consequence and Probability.
	High - negative	
	Moderate - negative	
	Low - negative	
	Very low	
	Low - positive	
	Moderate - positive	
	High - positive	
	Very high - positive	

Table A 2: Explanation of assessment criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect (change) the construction, operation and management of the proposed development would have on the affected environment. Will the impact change in the environment be positive, negative or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. Extent or scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of small extent, are of very high importance, e.g., impacts on species of very restricted range. In order to avoid "double counting, specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium and long term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could possibly be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems substitutes are often possible (e.g., by constructing new social facilities for those that are lost). Should it not be possible to

	replace a resource, the resource is essentially irreplaceable e.g., red data species that are restricted to a particular site or habitat of very limited extent.
Consequence	The consequence of the potential impacts is a summation of above criteria, namely the extent, duration, intensity and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact actually occurring based on professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between probability of the impact occurring and probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
Significance	Impact significance is defined to be a combination of the consequence (as described below) and probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact actually occurring. In simple terms, if the consequence and probability of an impact is high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.
Degree of confidence in predictions	Specialists and the EAP team were required to provide an indication of the degree of confidence (low, medium or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. Degree of confidence is not taken into account in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact, or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

Table A 3: Impact assessment criteria and rating scales

Duration		Extent		Irreplaceable Resources		Severity		Consequence = (Duration+Extent+Irr) x Severity		Likelihood		Significance		Confidence
1	Temporary	**1**	Footprint	**1**	Yes	**-3**	High - negative	**-25 to -33**	Extremely detrimental	**1**	Unlikely	**-73 to -99**	Very high - negative	Low
2	Short term	**2**	Site	**0**	No	**-2**	Moderate - negative	**-19 to -24**	Highly detrimental	**2**	Likely	**-55 to -72**	High - negative	Medium
3	Medium term	**3**	Local			**-1**	Low -negative	**-13 to -18**	Moderately detrimental	**3**	Definite	**-37 to -54**	Moderate - negative	High
4	Long term	**4**	Regional			**0**	Negligible	**-7 to -12**	Slightly detrimental			**-19 to -36**	Low - negative	
		5	National			**1**	Low -positive	**0 to -6**	Negligible			**0 to -18**	Very low - negative	
		6	International			**2**	Moderate - positive							
						3	High - positive	**0 to 6**	Negligible			**0 to 18**	Very Low - positive	
								7 to 12	Slightly beneficial			**19 to 36**	Low - positive	
								13 to 18	Moderately beneficial			**37 to 54**	Moderate - positive	
								19 to 24	Highly beneficial			**55 to 72**	High - positive	
								25 to 33	Extremely beneficial			**73 to 99**	Very high - positive	

Appendix B: Landscape and visual impact assessment methodology

Appendix B1: Landscape character

Landscape character is a distinct, recognisable, and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse. Landscape character includes the natural and man-made attributes of the Study Area, including topography, land cover and vegetation. The overall landscape character is influenced negatively by incompatible activities, or positively by the presence of natural and/or man-made features, such as steep gradients, presence of rocky ridges, natural vegetation, pans, and floodplains.

Landscapes may be divided according to landscape character types, which are defined as distinct types of landscape that are relatively homogenous in character. These landscape types are generic and may occur anywhere in the country where the same combinations of physical and cultural landscape attributes occur. Aesthetic aspects of landscape character can be recorded in a systematic and objective way according to the following range of aspects:

- Scale
- Enclosure
- Diversity
- Texture
- Form
- Line
- Colour
- Balance
- Pattern
- Movement

In addition to the aesthetic aspects other aspects of landscape perception can further influence landscape character and may be more subjective and responses to them might be more personal and coloured by the experience of the individual. Such factors include a sense of wildness, sense of security, the quality of light and perceptions of beauty or scenic attractiveness. There are also some factors that can be perceived or experienced by senses other than sight, such as noisiness or tranquillity and exposure to the elements Swanwick (2002).

Table B 1: Aesthetic and perceptual aspects of landscape character Swanwick (2002)

Aspect	Characteristics				Motivation
Scale	Intimate	Small	**Large**	Vast	The scale of the landscape is considered large across the region, as it consists of a flat open plain with open seas in the south and east, with either low-growing fynbos vegetation or planted pasture. Views are interrupted only to the north by hills and mountains at the edge of the coastal plain. Towns in the area are relatively

Aspect	Characteristics				Motivation
					compact, and buildings do not interrupt views.
Enclosure	Tight	Enclosed	**Open**	Exposed	The landscape can be described as open. Topographically, most of the landscape is flat, with very limited narrow valleys and steep slopes. Although natural vegetation is uniformly short (less than 0,5m), exotic tree clumps close to the N2 interrupt views to the north.
Diversity	Uniform	**Simple**	Diverse	Complex	The landscape within the immediate project area can be described as simple as it consists of farmland with either natural vegetation or planted pasture. Although there are complex elements around towns, these are located far from the site.
Texture	Smooth	**Textured**	Rough	Very rough	The landscape is textured due by a combination of low rocky outcrops, hills, exotic tree clumps and electricity generation and transmission infrastructure.
Form	Vertical	Sloping	Rolling	**Horizontal**	The dominant form of the study area is horizontal (flat coastal plains with limited topographical variation).
Line	**Straight**	Angular	Curved	Sinuous	The landscape elements are mostly straight to somewhat curved with some large linear anthropogenic structures (e.g., wind turbines and transmission lines) visible.
Colour	Monochrome	**Muted**	Colourful	Garnish	The colours of the natural landscape are mid-tone to muted shades of grey (rocky outcrops and some vegetation),greens and grey-green (vegetation). Occasional small concentrations of colour occur when plants such as *Aloe africana* and *Brunsvigia gregaria*) are in flower. Most fynbos flowers (e.g., Erica species) have very small flowers that produce a fine textured "pixellated" displays during flowering season (autumn to winter). Landscape colours, expect the afore-mentioned flowers, remain uniform through the seasons. Planted pastures (mostly south of Humansdorp) are mid-green to dark green.
Balance	Harmonious	**Balanced**	Discordant	Chaotic	The majority of the landscape is considered balanced in terms of the relationship between the vertical and horizontal elements. The tall wind

Aspect	Characteristics				Motivation
					turbines and transmission lines are the only exception to this, but although they contrast with the landscape, they are located in concentrated areas and do not dominate the entire landscape.
Pattern	Random	Organised	**Regular**	Formal	The landscape is considered regular. Most of the landscape is farmland (natural vegetation or planted pasture) and settlements and roads are evenly spaced within the landscape.
Movement	Dead	Still	**Calm**	Busy	With the majority of the landscape being used for farming, and to a lesser degree tourism along the coast, it can be considered calm. Movement occurs in narrow road corridors between towns.

Appendix B2: Visual Absorption Capacity

VAC is an indication of the ability of the landscape to visually conceal the proposed development. Areas with high VAC can accommodate and absorb physical changes in the landscape without transforming its visual character and quality, while a low VAC rating implies a low ability to absorb or conceal visual impacts (Oberholzer, B .2005). The factors that contribute to the VAC factor includes topographical diversity, vegetation, soil contrast, visual pattern, and recovery time.

The factors are listed and explained below and adapted from the United States Bureau of Land Management (BLM, 2004).

Table B 2: VAC factors and rating

Factors	Rating criteria and score		
Vegetation	Low, uniform vegetation type. Typically, less than 1m in height lacking in variety and usually uniform in colour with minimal screening capability. Low scrub and grass type vegetation. Score:1	Vegetation of moderate height between 1 -2m with some variation in colour and type. Effectively screens low surface disturbance. Scrub/ grass with intermingled shrubs. Score:2	Vegetation of more than 2m in height. Continuous cover with significant screening potential for projects between 4 -6m in height. Score:3
Soil contrast	Surface disturbance would expose a high degree of contrast in colour with surrounding soil, rock and vegetation. Score:1	Surface disturbance would expose a moderate degree of contrast in colour with surrounding soil, rock and vegetation. Score:2	Surface disturbance would expose a low degree of contrast in colour with surrounding soil, rock and vegetation. Score:3
Visual variety	Rating units exhibits a low degree of visual variety in terms of the landscape character elements of form, line and texture with minimal variety in landforms, vegetation or colour. Score:1	Rating units exhibits a moderate degree of visual variety in terms of the landscape character elements of form, line and texture with moderate variety in landforms, vegetation or colour. Score:2	Rating units exhibits a high degree of visual variety in terms of the landscape character elements of form, line and texture with high variety in landforms, vegetation or colour. Score:3
Topographical diversity	Landform has low amount of topographic diversity and variety. Score:1	Landform has moderate amount of topographic diversity and variety. Score:2	Landform has high amount of topographic diversity and variety. Score:3
Recovery time	Long term recovery time, longer than 5 years. Score:1	Moderate recovery time (3 to 5 years) Score:2	High recovery time (less than 3 years) Score:3

Scores, when added, which amount to between 5 -7 and are categorised as Low, scores between 8 -11 as Moderate and between 12 -15 as High.

VAC is further closely related to visual intrusion, which refers to the physical characteristics and nature of the contrast created by a project on the visual aspects of the receiving environment. It is also, as with VAC, a measure of the compatibility or the conflict of a project with the existing landscape and surrounding land use. Visual intrusion is rated in Appendix C3.

Table B 3: VAC scores achieved

Factor	Score obtained	Motivation
Vegetation	2	The site has dense but low-growing and uniform fynbos vegetation. Vegetation south of the site up to the N2 consists of large groups of exotic trees. The visual qualities of these vegetation types are very different. On balance, between them, the score is intermediate.
Soil contrast	3	Geology on the site and in the rest of the study area is sandstone, which weathers to a light coloured to white sand. Clearance of vegetation would result in a high degree of contrast between the colours of the dark to mid-tone fynbos vegetation and the white sand.
Visual variety	2	Visual variety is moderate due to most of the study area being farmland and natural vegetation, with pockets of settlements and industrial looking infrastructure like wind turbines, transmission lines and industrial buildings (at Humansdorp).
Topographical diversity	2	The landform has low to moderate levels of topographic diversity, as it is primarily flat to gently sloping. Most of the landscape is a wide coastal plain, but hills and mountains create greater topographic diversity to the north of the site.
Recovery time	1	A temporary cover of annual plants can establish within a year to two years, but it takes several years for longer-living species to re-establish in fynbos vegetation. Most perennial fynbos species have life cycles of a decade to two decades. For instance, the frequency of fire in "moist mountain and lowland fynbos should be between 12 and 20 years" to ensure optimal regeneration. Therefore, a dense permanent cover of fynbos can be expected to take up to 10 years to establish.
Total	**10**	**Moderate**

Appendix B3: Visual intrusion

The degree of visual intrusion is closely related to the VAC and maintaining the integrity of the landscape and essentially rates the degree of contrast between the appearance of the proposed development and the existing environment. The higher the landscape quality and the more consistent the visual context, the more likely the impact will be intrusive. Visual intrusion is rated according to the table below.

Table B 4: Visual intrusion ratings

Rating	Criteria
High	Results in a noticeable change or is discordant with the landscape
Moderate	Partially fits into the landscape, but clearly noticeable
Low	Minimal change or blends in well with the surrounding landscape

Appendix B4: Landscape quality

Landscape quality is based on human perceptions and expectations in the context of the existing environment. A landscape's visual quality is therefore a factor of an observer's emotional response to physical landscape characteristics and therefore assigning values to visual resources is therefore a subjective process.

According to the Bureau of Landscape Management (BLM) division Visual Resource Management (VRM) system, a system specifically developed for minimising the visual impacts of surface disturbing activities and maintaining scenic values for the future. The landscape's scenic quality can be evaluated based on a combination of the landscape's intrinsic physical properties, consisting of the landform, vegetation, water, colour, adjacent scenery, scarcity and cultural or man-made modifications.

Landscape quality increases with the presence of water, topographic ruggedness and where diverse patterns of vegetation occur. Areas that contain more natural features or harmonious man-made compositions will have a more favourable landscape quality than areas with non-harmonious human activity.

Table B 5: Landscape Quality: Explanation of rating criteria

Factor	Definition
Landform	Topography becomes more interesting as it gets steeper or more massive, or more severely or universally sculptured. Outstanding landforms may be monumental, or they may be exceedingly artistic and subtle.
Vegetation	Give primary consideration to the variety of patterns, forms, and textures created by plant life. Consider short-lived displays when they are known to be recurring or spectacular. Consider also smaller scale vegetation features, which add striking and intriguing detail elements to the landscape.
Water	That ingredient which adds movement or serenity to a scene. The degree to which water dominates the scene is the primary consideration in selecting the rating score.
Colour	Consider the overall colour(s) of the basic components of the landscape (e.g., soil, rock, vegetation, etc.) as they appear during seasons or periods of high use. Key factors to use when rating "colour" are variety, contrast, and harmony.
Adjacent scenery	Degree to which scenery outside the scenery unit being rated enhances the overall impression of the scenery within the rating unit. The distance which adjacent scenery will influence scenery within the rating unit will normally range from 0-8 kilometres, depending upon the characteristics of the topography, the vegetative cover, and other such factors. This factor is generally applied to units that would normally rate very low in score, but the influence of the adjacent unit would enhance the visual quality and raise the score.
Scarcity	This factor provides an opportunity to give added importance to one or all the scenic features that appear to be relatively unique or rare within one physiographic region. There may also be cases where a separate evaluation of each of the key factors does not give a true picture of the overall scenic quality of an area. Often it is a number of not so spectacular elements in the proper combination that produces the most pleasing and memorable scenery - the scarcity factor can be used to recognize this type of area and give it the added emphasis it needs.
Cultural modifications	Cultural modifications in the landform/water, vegetation, and addition of structures should be considered and may detract from the scenery in the form of a negative intrusion or complement or improve the scenic quality of a unit. Rate accordingly.

Table B 6: Landscape quality: Rating criteria and scoring system

Factor	Rating Criteria and Score		
Landform	High vertical relief as expressed in prominent cliffs, spires, massive rock outcrops, areas of severe surface variation, highly eroded formations, dune systems or detail features that are dominant and exceptionally striking and intriguing. Score: 5	Steep canyons, mesas, buttes, interesting erosional patterns, landforms of variety in size and shape or detail features, which are interesting though not dominant or exceptional. Score: 3	Low rolling hills, foothills, or flat valley bottoms or few or no interesting landscape features. Score: 1
Vegetation	A variety of vegetative types as expressed in interesting forms, textures, and patterns. Score: 5	Some variety of vegetation, but only one or two major types. Score: 3	Little or no variety or contrast in vegetation. Score: 1
Water	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. Score: 5	Flowing, or still, but not dominant in the landscape. Score: 3	Absent, or present, but not noticeable. Score: 0
Colour	Rich colour combinations, variety, or vivid colour; or pleasing contrasts in the soil, rock, vegetation, water or snowfields. Score: 5	Some intensity or variety in colours and contrast of the soil, rock and vegetation, but not a dominant scenic element. Score: 3	Subtle colour variations, contrast, or interest; generally muted tones. Score: 1

Factor	Rating Criteria and Score		
Adjacent scenery	Adjacent scenery greatly enhances visual quality Score: 5	Adjacent scenery moderately enhances overall visual quality. Score: 3	Adjacent scenery has little or no influence on overall visual quality or and negatively contributes to the landscape quality. Score: 0
Scarcity	One of a kind, unusually memorable or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. Score: 5	Distinctive, though somewhat similar to others within the region. Score: 3	Interesting within its setting, but fairly common within the region. Score: 1
Cultural Modifications	Modifications add favourably to visual variety while promoting visual harmony. Score: 2	Modifications add little or no visual variety to the area, and introduce no discordant elements Score: 0	Modifications add variety but are very discordant and promote strong disharmony. Score: -4

Total scores amounting to less than 11 are categorised as Low, scores between 12 -18 are Moderate and scores higher than 19 are High.

Table B 7: Landscape quality rating

Factor	Score obtained	Motivation
Landform	1	The local landscape provides little topographical variety and interesting landforms, however the folded belt mountain to the north of the site provide topographical variation.
Vegetation	2	Natural vegetation is grassy fynbos that uniformly reaches a maximum height of 0.5m, but groups of exotic trees provide variation in colour, texture and height.
Water	0	There is no open water on the site.
Colour	2	The study area presented with subtle colour variations and muted tones.
Adjacent Scenery	3	The adjacent scenery includes hills and mountains to the north (less than 5km to the northwest) and the coastal scenery around 10km east of the site.
Scarcity	1	The landscape of the site is not unique to the larger region. Similar landscape types (and even areas with a higher landscape quality) can be found across the coastal plain and Gamtoos River valley.
Cultural modifications	-4	Proposed infrastructure will add visual variety but will introduce additional discordant elements within the study area. Other anthropogenic infrastructure related to electricity generation and transmission are present and somewhat reduce the quality of the landscape within the study area.
Total	**5**	**Low**

Appendix B5: Landscape Value

Landscape value is concerned with the relative value attached to a specific landscape by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons. Value can apply to areas of landscape as a whole or to the individual elements, features and aesthetic or perceptual dimensions which contribute to the character of the landscape (IEMA, 2013).

In determining landscape value, the people, or groups of people who could be affected by the proposed development should be considered, due to landscape being valuable to people in different ways. In this regard, consideration is given to:

- People who live and work in an area may have a different perception of the landscape to that held by visitors because of their regular contact with the landscape and the ongoing changes within it;

- Special interest, for example the ecological, cultural, or historic value of the landscape, as knowledge of these issues can often affect people's perception and appreciation of a landscape; and
- Landscapes valued by a public wider than the local population because they have a strong image or are well known and valued nationally and internationally.

Landscape value is based on receptor perception and is rated in the table below:

Table B 8: Receptor perception rating

Rating	Criteria
High	People attach a high value to aesthetics, such as in or around a game reserve, coastal areas, scenic routes or conservation areas, and the project is perceived to significantly impact on this value of the landscape
Moderate	People attach a moderate value to aesthetics, such as neighbourhoods and smaller towns, where natural character is still plentiful and in close range of residency.
Low	People attach a low value to aesthetics, when compared to employment opportunities. Environment has already been transformed

Appendix B6: Nighttime lighting

To determine the potential visual impact of nighttime lighting, it is important to understand the existing lighting levels within the Study Area. The Institute for Lighting Professionals ILP (2011) identifies five zones of environmental zones for exterior lighting control, describing the existing lighting conditions within the landscape. These zones are supported by design guidelines to reduce lighting pollution, which can inform mitigation measures.

Table B 9: Environmental zones for nighttime lighting ILP (2011)

Environmental Zones	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO starlight reserves, IDA dark sky parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Beauty
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban
E4	Urban	High district brightness	Town/City centres with high levels of nighttime activity

Light pollution falls within the following categories, ILP (2011):

- Skyglow: Wasteful light from artificial sources emitted upward (at horizontal angles and higher) is scattered by aerosols such as clouds and fog or small particulates like pollutants in the atmosphere. This scattering forms a diffuse glow that can be seen from far away. Skyglow is the most known form of light pollution;
- Light trespass: Unwanted light at night can seep through the windows of houses and buildings, causing sleeping disorders due to overexposure to light; and
- Glare: Excessive brightness at night creates high contrast and decreased visibility, causing discomfort or, in extreme cases, a blinding effect.

Lighting from vehicles within rural areas will generally be more intrusive than in urban settings and could therefore potentially have a greater impact due to general lack of existing ambient light within areas further away from the Study Area.

The ILP (2011) recommends that to maintain the nighttime setting, lighting within the identified zone should have minimal illumination into the sky as well as adjacent viewpoints.

Appendix B7: Visual receptors

Receptors for visual impacts are potential viewers of the proposed development. The perception of viewers is difficult to determine as there are many variables to consider such as:

- Familiarity with the actual scene;
- The location and context of the viewpoint;
- Circumstances that bring them into contact with that view (occupation or activity of the receptor) and;
- Nature and importance of the view (full or glimpsed, near or distant).

Other variables include cultural background, state of mind and how often the proposed project is viewed within a set period, it is therefore necessary to generalize the viewer sensitivity to some degree.

Potential visual receptors that may be affected by the proposed project include:

- Users of recreational landscapes and public footpaths, including tourists and visitors;
- Residents;
- Users of public sports grounds and amenity open space;
- Users of public roads and railways;
- Workers; and
- Views of or from within valued landscapes

Of the above visual receptors as mentioned above the most sensitive may include:

- Users of outdoor recreational facilities, whose attention or interest is focused on the landscape;
- Communities where the proposed development results in changes in the landscape setting or valued views enjoyed by them; and
- Residential property owners with views affected by the proposed development.

Table B 10: Receptor sensitivity rating

Receptor sensitivity	Explanation
High	Views to and from nature reserves, coastal areas, heritage sites and scenic routes or trails
Moderate	Views to and from residential areas, agricultural areas, sporting / recreational areas or places of work
Low	Views to and from industrial, mining, or degraded areas.

Appendix B8: Visual exposure and visibility

Visibility

Visibility is determined by the distance between the proposed project components and the visual receptor. The visibility or viewshed/ZTV of the project is the area from which the project will be visible and includes all the major observation sites from where the proposed project will be visible. The viewshed is theoretical as it assumes direct line of sight between any point within the viewshed and the object being viewed.

A GIS has been used to generate the viewshed analyses for the proposed project and related infrastructure. The system has 3D topographical modelling capabilities, including a line-of-sight analysis. For this project, the viewshed analysis was generated by means of contours using the proposed project and height of the associated infrastructure. The visibility of a development and its influence on visual impact is rated using the criteria listed in Table B 11 below.

Table B 11: Visibility classes, IEMA (2013)

Class	Description
Highly visible	Clearly noticeable within the observer's view frame 0-2km
Moderately visible	Recognisable feature within the observer's view frame 2-4km
Marginally visible	Not particularly noticeable within the observer's view frame 4-7km
Hardly visible	Practically not visible unless pointed out to observer beyond 7-10km

Visual exposure

Visual exposure refers to the geographic area from which the proposed project will be visible and is defined by the degree of visibility of a proposed project from various receptor sites. According to Hull and Bishop (1998), the visual exposure of the proposed project is based on the distance from the proposed source of impact and usually fades out beyond 7km. The visibility of an object decreases exponentially over distance and accordingly visual impact will diminish as the viewer moves away from the object being viewed. It is also important to note that the actual zone of visual influence of the proposed project may be smaller than indicated because of screening by existing vegetation and infrastructure. The influence of distance is shown in Figure B 1 below.

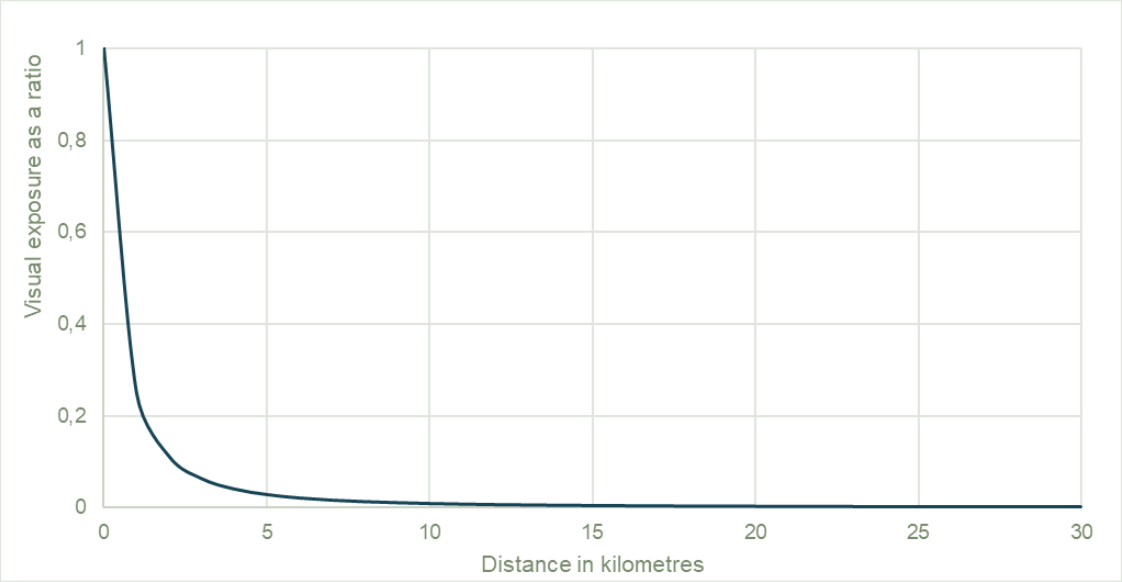

Figure B 1:Visual exposure (Bishop and Hull, 1988)

Viewshed Analysis

The viewshed analysis calculates the geographical locations from where the proposed project might be visible. This potential visual exposure of the project has been modelled by creating a DTM from 1m contour data, and applying a viewshed analysis using GIS software, whereby all areas with a line of sight towards the proposed project is indicated. It must be noted that the heights of existing infrastructure and vegetation are not included in the calculation of the viewshed as these factors have too much variability in terms of seasonal change and possible land use changes in an extensive study area such as the one being assessed. It is therefore important to bear in mind that the proposed development will not be visible from all points within the viewshed, as views may be obstructed by visual elements, whereby such intervening objects will modify the viewshed at ground level.

Appendix B9: Key Observation Points

KOPs was identified based on prominent viewpoints where views towards the proposed project and associated infrastructure where uninterrupted as well as at points where positive viewshed areas intersect with potential receptors. The KOPs were selected within a 7km radius

of the proposed project. The KOP analyses have been conducted by investigating the visual influence of the proposed infrastructure as per the available layout and information provided.

Appendix C: Impact rating tables

LANDSCAPE CHARACTER AND SENSE OF PLACE				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*Change in the landscape character and sense of place of the study area through the construction of additional industrial type infrastructure; the proposed development will add to the industrial/mining components within the existing context and could potentially result in negative changes to the landscape character and sense of place.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term*	*-5*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-10***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Refer to proposed mitigation measures under section 14.2.1.1 in the main report				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term*	*-5*	*2*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***

IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-10**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

LANDSCAPE CHARACTER AND SENSE OF PLACE				
PROJECT PHASE	*Operational phase*			
DIRECT IMPACT	*Change in the landscape character and sense of place of the study area through the introduction of additional industrial type infrastructure; the proposed development will add to the industrial/mining components within the existing context and could potentially result in negative changes to the landscape character and sense of place.*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*1*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-7***	***very low negative***		
PROPOSED MITIGATION MEASURES				

None				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-7**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

VISUAL INTRUSION AND VAC				
PROJECT PHASE	*Construction Phase*			
DIRECT IMPACT	*The level of compatibility and the ability of the landscape to visually absorb the proposed infrastructure, including contrasts in form, line, colour, and texture resulting from vegetation clearing*			
INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term*	*-5*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		

SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Negligible***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-10***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Refer to proposed mitigation measures under section 14.2.2.1in the main report				
POST-MITIGATION				
DURATION	2	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term*	*0*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	0	*Negligible*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**0**	**very low negative**		
CONFIDENCE LEVEL				
High				

VISUAL INTRUSION AND VAC				
PROJECT PHASE	*Operational Phase*			
DIRECT IMPACT	--			
INDIRECT IMPACT	*The level of compatibility and the ability of the landscape to visually absorb the proposed infrastructure, including contrasts in form, line, colour, and texture resulting from vegetation clearing.*			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**

PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*1*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-7***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Refer to proposed mitigation measures under section 14.2.2.1in the main report				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*0*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	0	*Negligible*	***Negligible***	***Unlikely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**0**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

VISUAL EXPOSURE AND VISIBILITY (PV Panels and BESS)	
PROJECT PHASE	*Construction Phase*
DIRECT IMPACT	*The visibility and presence of the construction of the PV facility and BESS*

INDIRECT IMPACT	--			
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*2*	*The duration of the activity associated with the impact will last 6-18 months and as such is rated as short term*	*-10*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-2*	*The severity of the impact is rated as Moderate negative as the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-20***	***low - negative***		
PROPOSED MITIGATION MEASURES				
Refer to proposed mitigation measures under section 14.3.1.1 in the main report				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*2*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	-1	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**-14**	**very low negative**		
CONFIDENCE LEVEL				

Medium				
VISUAL EXPOSURE AND VISIBIITY (PV panels and BESS)				
PROJECT PHASE	*Operational phase*			
DIRECT IMPACT	*The visibility and presence of the cleared PV facility and associated infrastructure.*			
INDIRECT IMPACT				
CUMULATIVE IMPACT	--			
DIMENSION	**RATING**	**MOTIVATION**	**CONSEQUENCE**	**LIKELIHOOD**
PRE-MITIGATION				
DURATION	*4*	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*-7*	*2*
EXTENT	*3*	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	*-1*	*The severity of the impact is rated as Low negative as the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected*	***Slightly Detrimental***	***Likely***
IMPACT ON IRREPLACEBLE REOURCES	*0*	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	***-14***	***very low negative***		
PROPOSED MITIGATION MEASURES				
Refer to proposed mitigation measures under section 14.3.1.1 in the main report				
POST-MITIGATION				
DURATION	4	*The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term*	*0*	*1*
EXTENT	3	*The extent of the impact is rated as Local as it affects the development area and adjacent properties*		
SEVERITY	0	*Negligible*	***Negligible***	***Unlikely***

IMPACT ON IRREPLACEBLE REOURCES	0	*No irreplaceable resources will be impacted.*		
SIGNIFICANCE	**0**	**very low negative**		
CONFIDENCE LEVEL				
Medium				

Appendix D: Summarised Curriculum Vitae

Name	:	**WEIDEMAN, ELMIE**
Date of Birth	:	28 September 1984
Profession/Specialisation	:	Landscape Architecture and Visual Impact Assessments
Nationality	:	South African
Years' experience	:	15

Key qualifications

Elmie is a professionally registered Landscape Architect *(SACLAP 20223)* and the owner of Create Landscape Architecture and Consulting. She is proficient in various aspects related to Landscape Architecture. This includes sustainable landscape design and comprehensive master planning from the conceptual stages through to detail design and implementation. She has also been involved with various design projects which have successfully achieved formal landscape sustainability credits.

She has gained valuable experience in the environmental part of Landscape Architecture where she has mostly dealt with landscape and vegetation rehabilitation, environmental management programmes (EMP's), environmental auditing/monitoring and Landscape and Visual Impact Assessments (LVIA's).

Elmie has worked on various international projects in Lesotho, Abu Dhabi, Nigeria, Kenya, Angola, Malawi, Liberia, Guinea, Botswana, and Mozambique. Elmie has 15 years of experience and holds a Master's (2008) and an Honours degree (2007) in Landscape Architecture, both which she obtained from the University of Pretoria in South Africa.

Relevant previous undertaken:

Ribbok and Eland WEF and SEF site sensitivity assessment (Northern Cape Province, South Africa). *Visual Specialist.* Create Landscape Architecture and Consulting has been appointed by an independent environmental consulting firm to undertake a site sensitivity assessment on various parcels of land which are earmarked for extensive SEF and WEF development.

Sinati Housing Estate (East London, Eastern Cape Province) 01/2023 – 01/2023
Visual Specialist. Create Landscape Architecture and Consulting has been appointed by ECI Consultants to undertake a Landscape and Visual Impact Assessment for a proposed housing estate close to the city of East London. (Billion Group)

Venetia Mine Glint and Glare Assessment (Alldays, Limpopo Province) 10/2022 – 12/2022
Glint and Glare Specialist. Create Landscape Architecture and Consulting was appointed by SRK Consultants to undertake the aviation and ground receptor glint and glare assessment for a proposed solar facility close to the Venetial Mine. (Anglo American)

Waterkloof SEF (Rustenburg, North West Province) 07/2022 – 12/2022
Visual Impact Specialist. Create Landscape Architecture and Consulting was appointed by GIBB Environmental to undertake the Landscape and Visual Impact Assessment for the proposed Waterkloof SEF at Royal Bafokeng Platinum Mine.

Siriti Kriel Open Pit Mining Pits and Dragline, (Kriel, Mpumalanga Province) 02/2022 - present.
Visual Impact Specialist. Create Landscape Architecture and Consulting has been appointed by Zutari South Africa to undertake the Landscape and Visual Impact Assessment for the proposed Pit 11 and 13 Opencast Operation and associated Dragline Walk at Kriel Colliery. (Seriti Coal (Pty) Ltd).

Mosselbay Energy proposed 1000MW Gas Plant (Mossel Bay South Africa) 11/2021 – 03/2022
Visual Impact Specialist. Create Landscape Architecture and Consulting has been appointed

by Sativatec to undertake a Landscape and Visual Impact Assessment for a 1000MW Gas Plant close to the town of Mosselbay. (PetroSA)

Greenleaf Energy 3000MW Plant (Mossel Bay, South Africa) 01/2022 – 03/2022. *Visual Impact Specialist.* Create Landscape Architecture and Consulting has been appointed by Sativatec to undertake a Landscape and Visual Impact Assessment for a 3000MW Gas Plant close to the town of Mosselbay. (Greenleaf Energy)

Dwaalboom Mining Rights (North West Province, South Africa) 02/2022 – 03/2022 *Visual Impact Specialist.* Create Landscape Architecture and Consulting has been appointed by EnviroSaint (Pty) Ltd. to conduct a Landscape and Visual Impact Assessment for a Mining Right Application (MRA) for Dangote Dwaalboom Mining (Pty) Ltd, a wholly owned subsidiary of Dangote Cement South Africa (Pty) Ltd. (Dangote Dwaalboom Mining (Pty) Ltd)

Benadeplaats Prospecting Rights (North West Province, South Africa) 02/2022 *Visual Impact Specialist.* Create Landscape Architecture and Consulting has been appointed by Sativatec to conduct a visual specialist study for the Witkop Fluorspar Mine which intend to apply for prospecting rights on Portion 8 of the Farm Benadeplaats.

Cresco De Beers PV Project (Limpopo Province, South Africa) 10/2021- 03/2022 *Visual Impact Specialist.* Zutari South Africa appointed Create Landscape Architecture and Consulting to conduct a Landscape and Visual Impact Assessment for a 100-Megawatt (MW) alternating current (MWac) Photovoltaic (PV) solar energy facility next to the Venetia Diamond Mine. This is done in order to reduce its consumption of grid-supplied power by procuring locally generated solar power. (De Beers Venetia)

God's Window Skywalk Project (Mpumalanga Province, South Africa) 02/2022 -06/2022. *Visual Impact Specialist.* Zutari Lesotho appointed Create Landscape Architecture and Consulting to conduct a preliminary visual inputs report and Landscape and Visual Impact Assessment for the newly proposed God's Window Skywalk and associated tourist building. The Skywalk involves a cantilevered structure which will protrude over the canyon's edge. (Mpumalanga Tourism and Parks Agency/ Mapulana Canyon (Pty) Ltd)

Polihali Reservoir Master Plan of the Feeder Roads and Bridges (Lesotho) 05/2021 – 05/2022t. *Visual Impact Specialist.* Zutari South Africa appointed Create Landscape Architecture and Consulting to conduct an options analysis (in terms of various visual criteria) for the feeder roads as well as a Landscape and Visual Impact Assessment for the advanced infrastructure which forms part of the Polihali Reservoir. (LHDA)

Mogalakwena PV Facility (Limpopo Province, South Africa) 06/2021 *Visual Impact Specialist.* Zutari South Africa appointed Create Landscape Architecture and Consulting to conduct a specialist landscape and visual assessment for a PV Facility which will supply energy on an exclusive basis to the Anglo-American Platinum Mogalakwena Mine in Limpopo, South Africa in terms of a Power Purchase Agreement. (Anglo American Platinum)

Cato Ridge Strategic Environmental Assessment (KwaZulu Natal Province) 03/2021 – Current. *Visual Impact Specialist.* Zutari South Africa appointed Create Landscape Architecture and Consulting to conduct a strategic visual assessment for a 1800ha mixed used development to stimulate economic opportunities across the wider community of Cato Ridge. Due to the scale of the proposed footprint, coupled with environmental sensitivities and long-term development horizon, a Strategic Environmental Assessment (SEA) is proposed to refine potential layout options and no-go areas. (Assmang (Pty) Ltd and Cato Ridge Development Company Ltd (CRDC))

Mokolo Crocodile Water Augmentation Project (MCWAP) Phase 2 Environmental Impact Assessment. (Limpopo Province, South Africa) 01/2021 -04/2021 *Visual Impact Specialist.* GBN -JV appointed InterDesign Landscape Architects to conduct the specialist Landscape and Visual Impact Assessment for the MCWAP phase 2. The project involves the transfer of water from the Crocodile River (West) to the Steenbokpan and Lephalale areas, including the

implementation of the River Management System in the Crocodile River (West) and its tributaries. The aim of the Landscape and Visual Impact Assessment was to determine the visual impact of infrastructure elements based on the latest engineering designs. (Department of Water and Sanitation)

Landscape and visual impact assessment for a mining right application near Vanrhynsdorp (Western Cape Province, South Africa) 01/2021 *Visual Impact Specialist.* Sativatec appointed CREATE Landscape Architects and Consulting for conducting the specialist landscape and visual impact assessment which forms part of the Environmental Impact Assessment study. The aim of the application for environmental authorisation is to graduate the prospecting rights into a composite mining right for Limestone, Calcite, Aggregate, Dolomite and Dolomitic Limestone on two sites in the Vanrhynsdorp district. (Blue Waves Properties (Pty) Ltd.

ANNA Transmission Project (Angola – Namibia) 01/2019 – 02/2020 *Visual Impact Specialist*
Create Landscape Architecture and Consulting was appointed by Aurecon South Africa to do a visual impact assessment for the 400kV overhead transmission power line, with a total length of approximately 390 km from the Kunene substation in Namibia (currently under construction) to the proposed Lubango substation in Angola. (SAPP cc (South African Power Pool) via Aurecon South Africa)

Eskom KZN northern strengthening Visual Impact Assessment **(Kwazulu – Natal, South Africa)** ***07/2016 – 11/2017*** *Visual Impact Specialist*
The Northern KZN Strengthening project consists of the construction of the new Iphiva Substation situated near Mkuze, approximately 20km west of the Mkuze Game Reserve, a new feeder bay at the Normandie Substation (situated approximately 18km south east of the town of Piet Retief) and a 120km Transmission Line will also be constructed, connecting these 2 substations. (Eskom)

Amandelbult Visual Impact Statement **(North West Province, South Africa)** ***01/2017 – date*** *Visual Impact Specialist.* Rustenburg Platinum Mines Limited (RPM), owned by Anglo American Platinum (Pty) Ltd proposes the mining of shallow reefs for Platinum Group Elements (PGE) through the proposed Haakdoorndrift Opencast pit at its Amandelbult Section within its Mining Right boundary. A visual statement was compiled on order to measure the visual impact of the proposed development on the receiving environment. (Anglo American Platinum)

BOSA Visual Impact Assessment 06/2016 – date **(North West Province South Africa – Botswana)** *Visual Impact Specialist*
Aurecon has been appointed to undertake an Environmental and Social Impact Assessment (ESIA) study to assess and address environmental and social impacts associated with the Botswana-South Africa (BOSA) Transmission Interconnection Project. A visual impact assessment of the study area is required to inform the ESIA of the potential impacts posed by the construction and operational activities of the proposed project.

Nuclear 1 specialist review **08/2015** *Visual Impact Specialist.* Aurecon South Africa has been appointed by GIBB to conduct an external specialist study review for the proposed Nuclear 1 power plant. (GIBB)

Olifants Water Reclamation Project **(Limpopo Province, South Africa) 07/2015 –12/2015** *Visual Impact Specialist.* The Olifants River Water Resource Development Project (ORWRDP) is an extensive water resource development project which will supply water for domestic and industrial use in the Limpopo province. The DWA appointed the Trans –Caledon Tunnel Authority (TCTA) as project implementer to oversee the project funding, planning and construction of phases 2B to 2F, whilst at the same time taking account of environmental obligation compliance. The project involves the construction of bulk water transfer pipelines between Flag Bashielo Dam and Pruissen Reservoir near Mokopane (total length 72km) and between De Hoop dam and Olifantspoort (total length120km). The project will deliver water to the domestic as well as the mining sector. (TCTA).

***Sibanye Gold PV plant Visual Impact Assessment* (Carletonville, South Africa) 07/2014 –2016**
Visual Impact Specialist
Aurecon South Africa was appointed by Sibanye Gold to conduct a site screening, scoping and final EIA study for their proposed 200MW photovoltaic energy facility. (Sibanye Gold)

***Saldanha tank farm* (Western Cape Province, South Africa) 03/2012 - 03/2013.** *Visual Impact specialist.* Aurecon was appointed as visual sub consultant on both the scoping and environmental impact assessment phase for an extension to the existing oil tank farm located close to Saldanha Bay. Responsible for the visual impact assessment. (Worley Parsons).

***Eskom: Sigma - Theta power station power line* (KwaZulu-Natal Province, South Africa) 12/2010 – 06/2011.** *Visual Specialist.* Aurecon was appointed to complete an environmental impact assessment (EIA) and environmental management plan (EMP) for the proposed power line from Albert Falls in the Natal Midlands to Empangeni for the establishment of two 400 kV power lines, approximately 150 km in length, to link the Sigma substation and the Theta substation. Responsible for the visual impact assessment (VIA). (Eskom).

***Kriel Power Station* (Mpumalanga Province, South Africa) 11/2009 - 04/2015.** *Environmental Specialist.* Aurecon was appointed to compile an environmental impact assessment (EIA) and environmental management plan (EMP) for an extension to the existing ash dam facilities. Responsible, as a member of the specialist team, for compiling a visual impact assessment (VIA) focusing on two alternative sites. (Eskom).