

APPENDIX F6: Landscape/Visual Impact Assessment

MOSSDUSTRIA

PROPOSED EXPANSION OF MOSSDUSTRIA INDUSTRIAL AREA, DEVELOPMENT OF A MOTOR SPORT ARENA AND A SOLAR PV FACILITY, MOSSEL BAY, WESTERN CAPE PROVINCE

LANDSCAPE & VISUAL IMPACT ASSESSMENT

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1 INTRODUCTION

1.1 GENERAL

This Landscape and Visual Impact Assessment (LVIA) study forms part of the application for environmental authorisation, for a multi-purpose development including the proposed extension to the Mossdustria industrial area, development of a raceway and a solar PV facility in Mossel Bay Local Municipality. The Scoping and Environmental Impact Assessment Process is being undertaken by GIBB Environmental on behalf of Mossel Bay Local Municipality, Eastern Cape in terms of the amended National Environmental Management Act (NEMA) Act No. 107 of 1998, and the associated 2014 Environmental Impact Assessment (EIA) Regulations (as amended).

1.2 BACKGROUND

This Landscape and Visual Impact Baseline Report forms part the Scoping and Environmental Impact Assessment process that is being undertaken for the proposed expansion of Mossdustria, development of a raceway and solar PV facility. The process is being undertaken by GIBB Environmental on behalf of Mossel Bay Local Municipality.

1.3 PROJECT LOCATION

The proposed development Focus Area is located approximately 5.33km west of Mossel Bay in the Western Cape Province (Map 1: Locality Map).

The approximate geographic coordinates of the centre of the proposed Focus Area are;

South	34 ⁰	09'	59.10"
East	22 ⁰	00'	18.90"

The project site is comprised of Remainder of Portion 8 of the Farm Rietvalley 225.

The site area adjoins and is south of the existing Mossdustria development.

No site alternatives are under consideration, however layout alternatives are being considered.

1.5 BACKGROUND OF SPECIALIST

Jon Marshall (Pr. LArch, CMLI, Dip LA) qualified as a Landscape Architect in 1978. He has been a Chartered Member of the Landscape Institute (UK) since 1986. He is also a registered Landscape Architect and has extensive experience of environmental impact assessment in South Africa.

During the early part of his career (1981 – 1990) he worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He worked in the United Kingdom (1990 – 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiry for new store development. He also prepared the VIA input to the environmental statement for the

Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Bill (1993).

His more recent VIA work in Africa (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations, a number of commercial and residential developments as well as numerous renewable energy projects.

A brief CV is attached for information (**Appendix I**).

1.6 BRIEF AND RELEVANT GUIDELINES

The brief is to assess the landscape and visual impact of the proposed project.

The requirement for this was highlighted in the DFFE Screening Tool Report which indicated that a Landscape and Visual Impact Assessment was required. This report indicates that a site sensitivity verification must be undertaken in accordance with Government Notice No. 320 included in Government Gazette 43110 of the 20th March 2020. This document fulfils these requirements.

In addition to the above, this document complies with Appendix 6 of the EIA Regulations which lists requirements of Specialist Reports, see schedule below.

Regulation GNR 326 of 4 December 2014, as amended 7 April 2017, Appendix 6	Section of Report
1. (1) A specialist report prepared in terms of these Regulations must contain-	1
a) details of- i. the specialist who prepared the report; and ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;	
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	Separate document.
c) an indication of the scope of, and the purpose for which, the report was prepared;	1
(cA) an indication of the quality and age of base data used for the specialist report;	1
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	4
d) the date and season of the site investigation and the relevance of the season to the outcome of the assessment;	1
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	1
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	3

g) an identification of any areas to be avoided, including buffers;	3
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;	Map 4
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	1
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;	4
k) any mitigation measures for inclusion in the EMPr;	4
l) any conditions for inclusion in the environmental authorisation;	None
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	None
n) a reasoned opinion- i. whether the proposed activity, activities or portions thereof should be authorised; (iA) regarding the acceptability of the proposed activity or activities; and ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	5
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	None
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	-
q) any other information requested by the competent authority.	-
2) Where a government notice <i>gazetted</i> by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	1

Landscape and Visual impact assessment work will be undertaken in accordance with the following guideline documents;

- a. The Government of the Western Cape Guideline for Involving Visual and Aesthetic Specialists in EIA Processes (Western Cape Guideline), which is the only local relevant guideline, setting various levels of assessment subject to the nature of the proposed development and surrounding landscape, and
- b. The Landscape Institute and Institute of Environmental Management and Assessment (UK) Guidelines for Landscape and Visual Impact Assessment which provides detail of international best practice (UK Guidelines).

Refer to **Appendix II** for the Western Cape Guideline.

Due to the nature of the surrounding landscape and based on the predicted low levels of landscape and visual impacts described at the scoping stage, it seems that the proposed development is unlikely to result in significant impacts. Because of this it is proposed that a Level 2 Assessment is undertaken in accordance with the Western Cape Guidelines.

A Level 2 Assessment requires the following input:

- Identification of issues raised in scoping phase, 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.

1.7 LIMITATIONS AND ASSUMPTIONS

The following limitations and assumptions should be noted:

In the assessment tables the subjective judgement as to whether an impact is negative or positive is based on the assumption that the majority of people are likely to prefer to view a natural or a rural landscape than an industrial landscape.

A site visit was undertaken on the 23rd March 2023 to verify the likely difference in the visual impact of the proposed deviations compared with the originally approved power line alignment.

The site visit was planned to ensure that weather conditions were clear ensuring reasonable visibility.

The timing of photography was planned to ensure that the sun was as far as possible behind the photographer. This was to ensure that as much detail as possible was recorded in the photographs.

Visibility of the proposed facility has been assessed using the Global Mapper Viewshed tool.

The visibility assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASA and is freely available on the CIAT-CCAFS website (<http://www.cgiar-csi.org>). This data has been ground truthed using a GPS as well as online mapping.

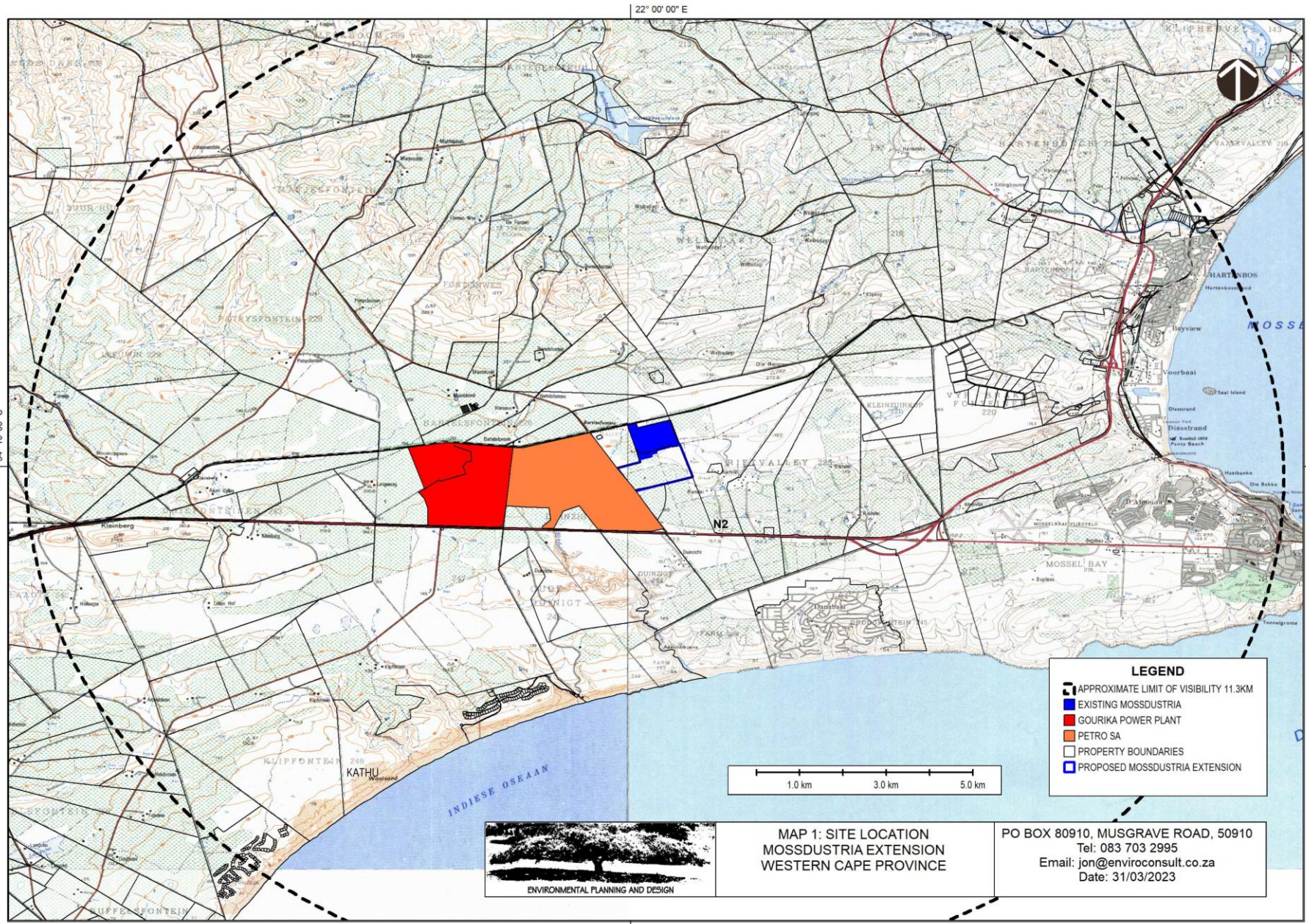
Calculation of visibility is based purely on the Digital Elevation Model and does not take into account the screening potential of vegetation or other development.

It is noted that the Screening Tool indicates that the site is visually sensitive. In terms of Landscape and Visual impact it is not necessarily that the site is sensitive but rather that the surrounding landscape and receptors may be sensitive to the proposed development. Sensitive sections of the landscape and receptors are indicated in Section 3.

The following GIS data sets were used in undertaking and presenting the assessments:

DATA SET	SOURCE	YEAR
South Africa Protected Areas Database (SAPAD)	Department of Environmental Affairs	2021

SRTM Worldwide Elevation Data	CIAT-CCAFS	2018
World Imagery	ESRI	2009 (updated 2021)
SA NLC (National Land Cover)	Department of Environmental Affairs	2018
1:50,000 raster mapping	Chief Directorate National Geo-Spatial Information of South Africa	Unknown
South African rivers in drainage region ALL	Department of Water Affairs	2012
Update of vegm2009	South African National Biodiversity Institute	2015
South Africa /Lesotho Roads	Open Street Map	2014



LEGEND

- APPROXIMATE LIMIT OF VISIBILITY 11.3KM
- EXISTING MOSSDUSTRIA
- GOURIKA POWER PLANT
- PETRO SA
- PROPERTY BOUNDARIES
- PROPOSED MOSSDUSTRIA EXTENSION



MAP 1: SITE LOCATION
MOSSDUSTRIA EXTENSION
WESTERN CAPE PROVINCE

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2. PROPOSED DEVELOPMENT AND ITS GENERAL VISIBILITY

2.1 GENERAL

A project area with an extent of approximately 90ha has been identified as suitable area for the proposed development.

2.2 PROJECT OVERVIEW

The project is proposed to accommodate the following elements:

- 13ha of Industrial expansion in the form of light industrial use similar to existing;
- 22ha of Alternative Energy development in the form of a solar photovoltaic (PV) array with necessary grid connection;
- 38ha motorsports development including a race circuit, pits, spectator stands and parking;
- A small business park; and
- 15ha conservation area.

At the time of reporting, no detail has been provided regarding these elements. The following assumptions have therefore been made;

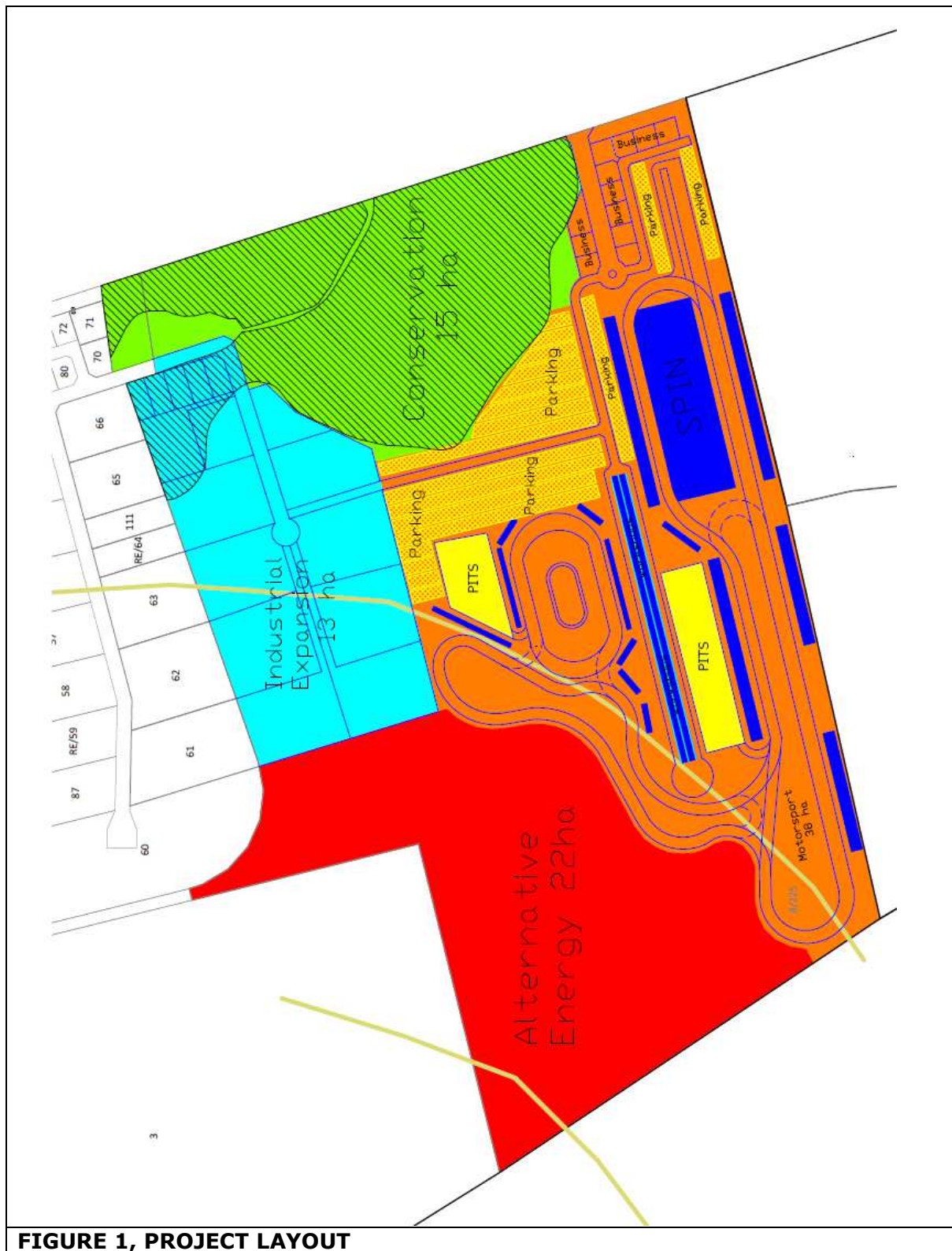
The Alternative Energy facility will is likely to include a solar PV facility.

In the absence of information it has been assumed that:

The maximum height of development will be similar to existing development on Mossdustria (+/- 12m);

The Alternative Energy facility will connect internally within Mossdustria. The facility will be connected via a new 11kV overhead powerline located within an existing servitude to an existing substation within Mossdustria.

Refer to Figure 1 Project Layout



2.2 OVERVIEW OF SOLAR PV TECHNOLOGY

Solar energy facilities, such as those which utilise PV technology use the energy from the sun to generate electricity through a process known as the **Photovoltaic Effect**. Generating electricity using the Photovoltaic Effect is achieved through the use of the following components:

Photovoltaic Modules

PV cells are made of crystalline silicon, the commercially predominant PV technology, that includes materials such as polycrystalline and monocrystalline silicon or thin film modules manufactured from a chemical ink compound. PV cells are arranged in multiples / arrays and placed behind a protective glass sheet to form a PV module (Solar Panel). Each PV cell is positively charged on one side and negatively charged on the opposite side, with electrical conductors attached to either side to form a circuit. This circuit captures the released electrons in the form of an electric current (i.e. Direct Current (DC)). When sunlight hits the PV panels free electrons are released and flow through the panels to produce direct electrical (DC) current.

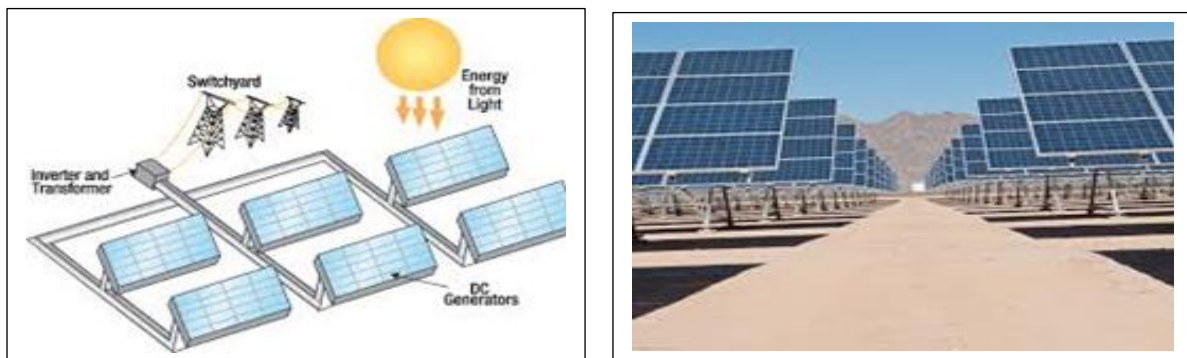


Figure 2: Overview of a typical/generic PV cell, module, and array/panel, noting that the photograph on the right appears to depict a single axis tracking mount, but it is not clear from the angle of the photograph. Whether these depict mono- or bi- facial modules is also unclear (pveducation.com).

Inverters

Inverters are used to convert electricity produced by the PV panels from Direct Current (DC) into Alternating Current (AC), to enable the facility to be connected to the national electricity grid. In order to connect a large solar facility such as the one being proposed to the national electricity grid, numerous inverters will be arranged in several arrays to collect, and convert power produced by the facility.

Support Structures

PV panels will be fixed to a support structure. PV panels can either utilise fixed / static support structures, or alternatively they can utilise single or double axis tracking support structures. PV panels which utilise fixed / static support structures are set at an angle (fixed-tilt PV system) so as to optimise the amount of solar irradiation. With fixed / static

support structures the angle of the PV panel is dependent on the latitude of the proposed development, and may be adjusted to optimise for summer and winter solar radiation characteristics. PV panels which utilise tracking support structures track the movement of the sun throughout the day so as to receive the maximum amount of solar irradiation.

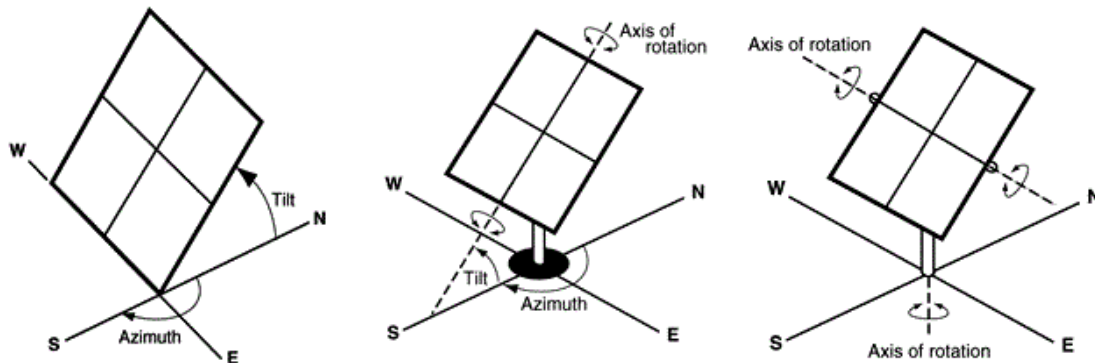


Figure 3: Overview of different PV tracking systems (from left to right: fixed-tilt, single-axis tracking, and double-axis tracking (Source: pveducation.com)).

The design and nature of the proposed solar array was not available at the time of reporting.

PV panels are designed to operate continuously for more than 20 years and with low maintenance.

On Site Electrical Infrastructure Compound:

An on-site electrical infrastructure compound typically comprises of a substation and associated infrastructure and could include additional collector infrastructure and / or a Battery Energy Storage System (BESS).

On-site substations serve as collection points for the AC current from inverters that are located within the solar array. They include step-up infrastructure to step up voltage for evacuation into the grid network.

The need for a BESS stems from the fact that electricity is only produced by the Renewable Energy Facility while the sun is shining, while the peak demand may not necessarily occur during the daytime. Therefore, the storage of electricity and supply thereof during peak-demand will mean that the facility is more efficient, reliable and electricity supply more constant.

The BESS will store and integrate a greater amount of renewable energy from the Solar PV Facilities into the electricity grid. This will assist with the objective to generate electricity by means of renewable energy to feed into the Municipal Grid.



PLATE 1, TYPICAL BATTERY ENERGY STORAGE SYSTEM

2.3 GLARE FROM A PV ARRAY

A common misconception about solar photovoltaic (PV) panels is that they inherently cause or create glare, posing a nuisance to neighbours. While in certain situations the glass surfaces of solar PV systems can produce glint (a momentary flash of bright light) and glare (a reflection of bright light for a longer duration).

Light absorption, rather than reflection, is central to the function of a solar PV panel to absorb solar radiation and convert it to electricity. Solar PV panels are constructed of dark-coloured (usually blue or black) materials and are covered with anti-reflective coatings. Modern PV panels reflect as little as two percent of incoming sunlight, about the same as water and less than soil. Some of the concern and misconception is likely due to the confusion between solar PV systems and concentrated solar power (CSP) systems. CSP systems typically use an array of mirrors to reflect sunlight to heat water or other fluids to create steam that turns an electric generator¹.

Glare experienced at ground level generally occurs when the sun is low in the sky and the angle of incidence is such that light is reflected rather than refracted through the panel surface. The risk of this occurring is therefore highest during early morning and late afternoon.

In South Africa affected areas during the early morning will generally vary from the west of the array during summer months to the north west of the array during winter months when the rising sun is further north.

Affected areas during the late afternoon will generally vary from the east of an array during summer months to the north east of an array during winter months.

¹ US Department of Energy

Because glare is reflected light from an inclined panel, it will generally affect areas above the level of the panel surface.



Plate 6 - Glare experienced in the Control Tower at Boston Regional Airport from an adjacent PV array

The main area of concern relates to the possibility of glare affecting drivers vision on the R327. Because this road is to the east of the proposed solar array, this is most likely to occur during late afternoon / early evening when the sun is low and to the west of the proposed project. Due to distance from the road and the fact that there will be built development between the solar array and the road, Glare is unlikely to be problematic. However, should the conceptual layout change to place the solar array closer to the road, it is possible that this situation could change.

It is likely that glare could affect the adjacent industrial expansion area and possibly drivers on the race track.

Mitigation will need to be designed into the layout. This might include:

- The use of non-reflective finishes on solar panel faces;
- The use of a tracking system which might be programmed to avoid glare during high risk periods;
- The use of an opaque screen between the eastern edge of the array and sensitive receptors.

The N2 which is located south of the proposed solar array will not be affected by glare.

2.4 GENERAL VISIBILITY

At the time of reporting, no detail has been provided regarding the detail of the proposed development elements.

The proposed Project is likely to be visible to a similar extent as the existing Mossdustria development.

It is important to identify the extent of general visibility at an early stage in the assessment as this will define the extent of the study area.

Using a proven formula, the proposed development could be visible for the following distance;

Approximate Limit of Visibility (ALV)

ELEMENT	APPROXIMATE LIMIT OF VISIBILITY
Development height – 12m	12.4 kilometres

In reality the ALV distance noted will be reduced by:

- Weather conditions that limit visibility. This could include hazy conditions during fine weather as well as mist and rain;
- Scale and colour of individual elements making it difficult to differentiate structures from the background; and
- The fact that as the viewer gets further away, the apparent height of visible elements reduces. At the limit of visibility it will only be possible that the very tip of an object may be visible. This reducing scale means that an object will become increasingly more difficult to see as the distance from it increases.

3 RECEIVING ENVIRONMENT

3.1 THE STUDY AREA

It is possible that landscape change due to the proposed development could impact the character of the surrounding landscape. Landscape character can be derived from specific features relating to the urban or rural setting and may include key natural, historic or culturally significant elements. Importance might also relate to landscapes that are uncommon or under threat from development.

This section will;

- describe the types of landscapes that may be impacted
- indicate likely degree of sensitivity
- describe how the landscape areas are likely to be impacted

3.2 LANDSCAPE CHARACTER

Landscape character is defined as “a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another”².

Landscape character has been defined using a desk top assessment using existing data sets and aerial photography as well as from a subsequent site visit.

The affected area has a strong urban character, interspersed with open space, and industrial activities particularly mining, and settlement.

Landscape Character is a composite of a number of influencing factors including;

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

3.2.1 Landform and Drainage

Refer to Map 2 for analysis of the landform and drainage.

The proposed site is located on a plateau area above the coastal plain.

From approximately 2km to the south of the site, the landform falls relatively evenly towards the sea.

From approximately 2km to the north of the proposed site, the land rises to a minor ridgeline approximately 140m above the level of the site.

To the east there is a gradual fall towards Die Voor Bay.

Drainage lines are generally short and fall towards the sea to the south.

Visual implications include:

- The ridgeline to the north will limit visibility from that direction; and

² UK Guidelines

- Due to landform falling away towards the sea to the south, it is unlikely that development on the site will be visible from coastal areas.

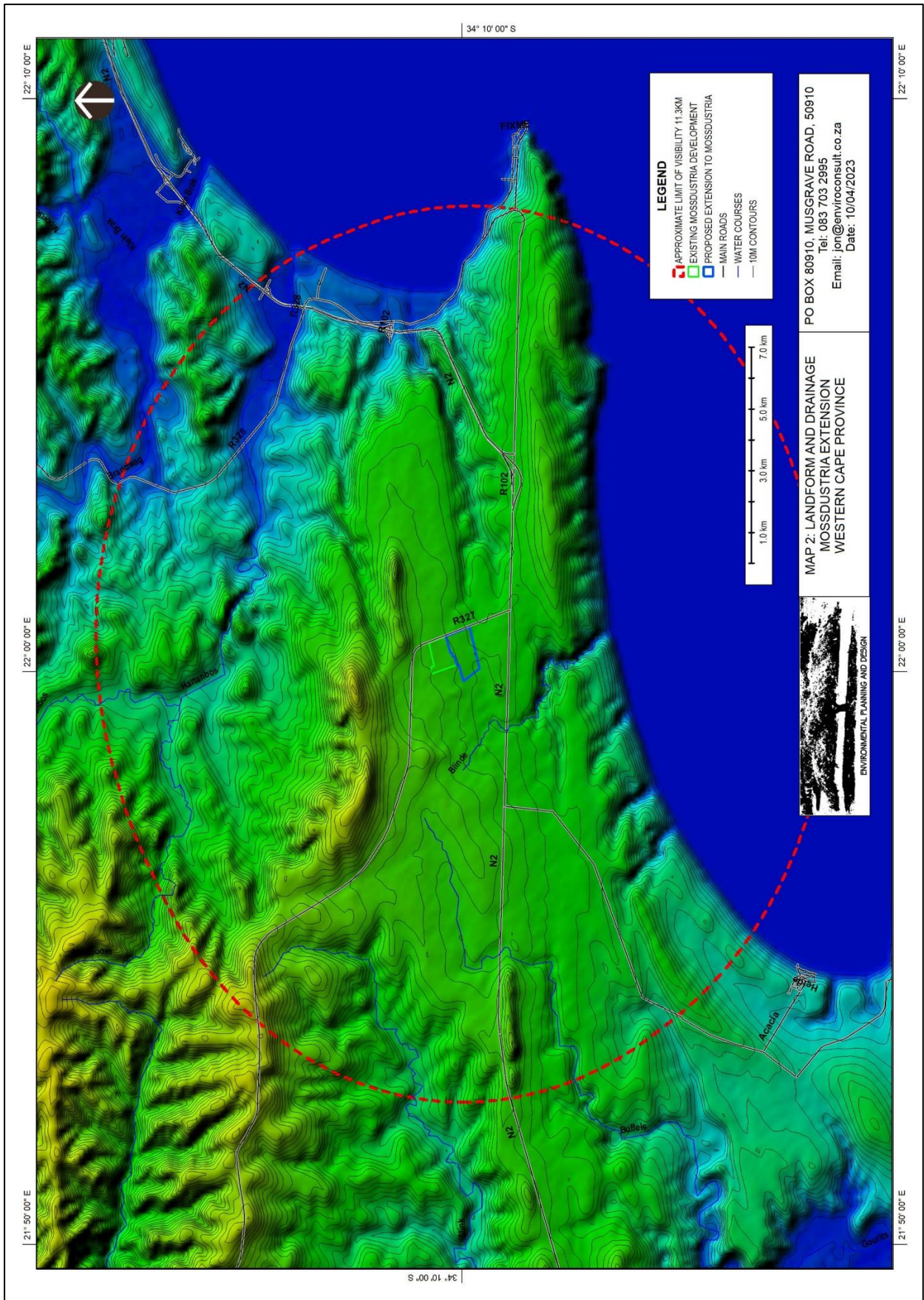




Plate 2, View looking from the N2 across the site and existing Mossdustria to the minor ridgeline approximately 2km to the north

3.2.2 Landcover

Refer to Map 3 for analysis of Landcover.

The predominant landcover in the vicinity of the proposed site is comprised of low shrub cover. Much of this low shrubland has been transformed to farm land that is used for grazing and ostrich camps.

Areas of the adjacent coastal plain are generally developed with predominantly residential development.

Immediately to the north of the proposed site is the existing Mossdustria industrial development. Adjoining this site to the west is Petro SA and immediately to the west of that is the Gourika Power Plant which is a Gas Turbine power plant that is used for Peakload. The fuel for the power plant is procured from the Petro SA Refinery.

During the site visit it was noted that land between the proposed site and the N2 was being advertised for sale for industrial development.

Local roads include:

- The N2 that runs approximately 1km to the south of the proposed site; and
- The R327 that links the N2 and coastal areas to inland areas, the R327 runs adjacent to the eastern boundary of the proposed site.

There is also an existing railway line that runs immediately north of the existing Mossdustria development.



Plate 3, Cattle grazing on land to the east of the proposed site.



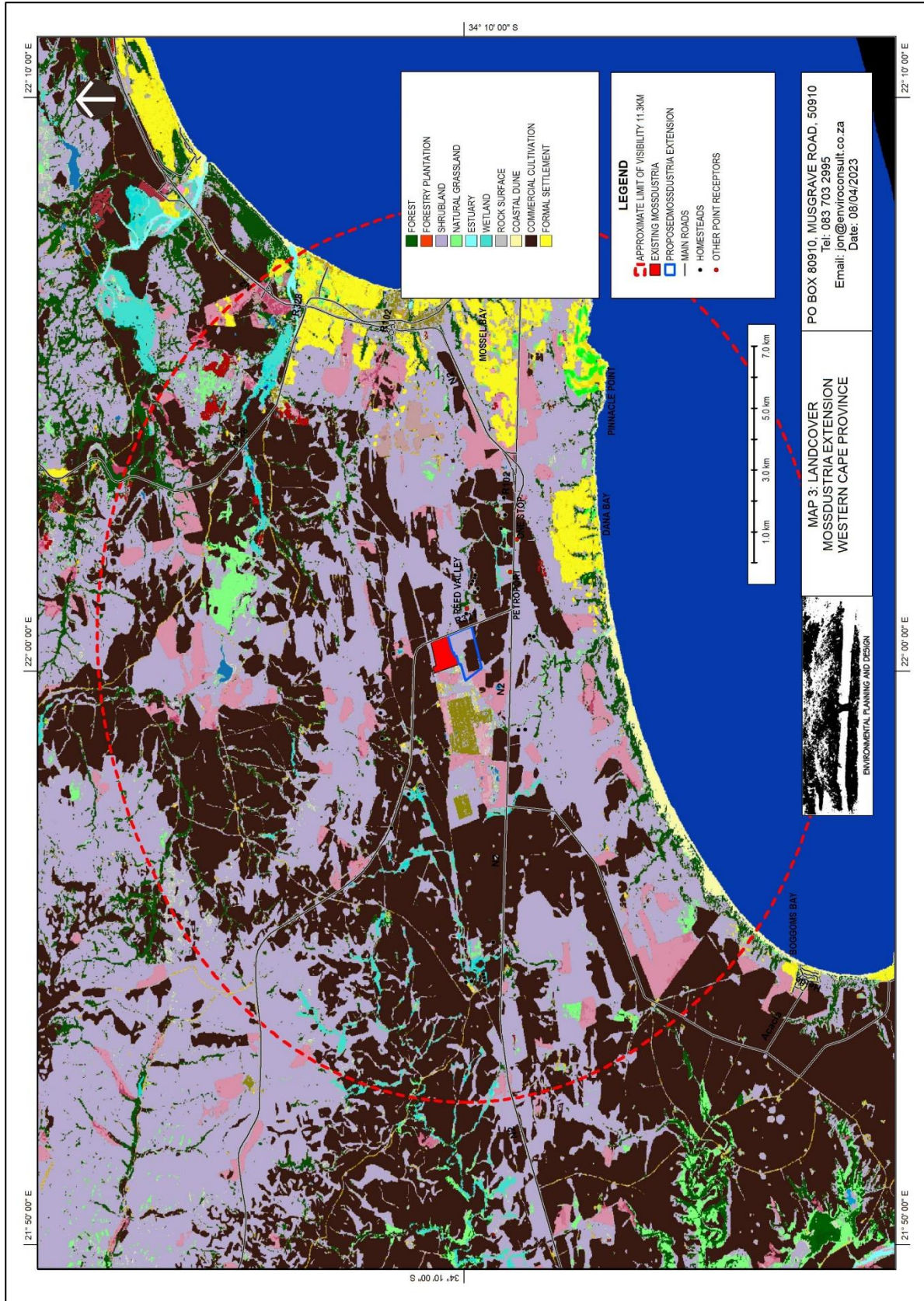
Plate 4, Gourika Power Plant to left of picture and Petro SA right of picture as seen from the N2



Plate 5, The N2 national road



Plate 6, The railway running immediately north of existing Mossdustria



3.3 LANDSCAPE CHARACTER AREAS & VISUAL ABSORPTION CAPACITY

Landscape Character Areas (LCAs) are defined as "single unique areas which are the discrete geographical areas of a particular landscape type"³.

Visual Absorption Capacity (VAC) is *defined* as the landscape's ability to absorb physical changes without transformation in its visual character and quality. Where elements that contrast with existing landscape character are proposed, VAC is dependent on elements such as landform, vegetation and other development to provide screening of a new element. The scale and texture of a landscape is also critical in providing VAC, for example; a new large scale industrial development located within a rural small scale field pattern is likely to be all the more obvious due to its scale.

The affected landscape can be broadly divided into the following LCAs that are largely defined by the extent and nature of development:

- **Urban Landscape Character Area** which is dominated residential development located largely on the coastal plain. It should be noted that in the proximity of Mossel Bay to the east of the site, that residential development does extend beyond the coastal plain and onto the plateau area approximately 6km to the east of the proposed site. This LCA is largely located in areas that it will have minimal influence on the proposed development.
- **Industrial Landscape Character Area** which is comprised of the Mossdustria industrial development and the adjacent Petro SA and Gourika Power Plant. Whilst these are the main industrial operations in the area it should be noted that a major transport company is operating from an adjacent site. This LCA will provide a degree of VAC for two reasons:
 - The proposed development is likely to be considered to be visually in keeping with this LCA; and
 - The existing industrial development will provide screening from the north and west.
- **Rural Landscape Character Area** which is comprised of the majority of the area surrounding the proposed site and adjacent industry. This LCA is unlikely to provide significant VAC although trees along farm boundaries could provide a degree of screening.

3.4 LANDSCAPE QUALITY AND IMPORTANCE

The entire area falls within the Gouritz Cluster Biosphere Reserve. This biosphere reserve includes urban, industrial, rural and natural areas.

The purpose of biosphere reserves is the **conservation of biological diversity in various ecosystems**. The biosphere reserves are internationally recognized within the framework of UNESCO's Man and Biosphere (MAB) programme.

This area joins the Garden Route Biosphere Reserve providing environmental focus for approximately 470km of the coastline and its hinterland.

³ Landscape Institute & Institute of Environmental Management and Assessment

The affected area is not a scenic landscape. However it does have qualities that are likely to be important to people that live and work in the area. The extent of open space and the distance between residential areas and industry are probably the most important qualities from this respect.

3.5 LANDSCAPE CHARACTER AREAS

Landscape Character Areas are largely defined by landcover, they include:

The Urban LCA which includes urban areas indicated on the landcover map. These are generally residential areas close to the coast, most of which are screened from the development by landform. One area, Kwanonqaba, has the potential for residents to have long distance views of the proposed development particularly from the western edge;

The Rural LCA which includes the commercial cultivation, low herb land and natural grassland that generally surrounds the proposed development; and

Industrial LCA which includes the area of heavy industry adjoining the proposed development area. This includes the existing Mossdustria development, Petro SA and the Gourika Power Generation facility.

3.6 VISUAL RECEPTORS

3.6.1 Definition

Visual Receptors are defined as "individuals and / or defined groups of people who have the potential to be affected by the proposal"⁴.

Certain areas could also be sensitive due to an existing use. The nature of an outlook is generally more critical to areas that are associated with recreation, tourism and in areas where outlook is critical to land values.

3.6.2 Visual receptors

This section is intended to highlight receptors within the landscape which due to use could be sensitive to landscape change. They include;

Area Receptors:

- Settlement Areas, the only areas that are likely to be affected are those areas that extend onto the plateau including Kwanonqaba and the western suburbs of Mossel Bay.

Linear Receptors:

Linear receptors generally include routes through the area:

- The N2 which is the main regional arterial route that links Cape Town to the south with Durban to the north. In addition to its importance for business, this is an important tourism route.
- The R327 runs in a north-west – south-easterly direction. It is suspected that this road is mainly important for local connectivity.

⁴ Landscape Institute & Institute of Environmental Management and Assessment

- The railway, from internet research, there does not appear to be a passenger train that uses the railway line west of Mossel Bay. It is therefore unlikely that the rail line will be sensitive to the proposed development.

Point Receptors:

- Homesteads within the surrounding area.
- The Reed Valley venue that is located close and to the east of the proposed development site. This venue advertises wine tasting, a restaurant and music events. The venue is located approximately 500m east of the R327 and is set amongst a densely treed area.
- The One Stop and Petroport service areas on the N2. These facilities are used by travellers on the N2 including tourists. The Petroport facility is closest to the proposed development (approximately 2km).

The main receptors that have been identified are indicated on Maps 3 and 4 which indicate the Landcover and initial Zones of Theoretical Visibility analysis respectively.

3.7 LANDSCAPE AND RECEPTOR SENSITIVITY

It is difficult to define hard and fast criteria for assessment of subjective issues. In order to provide both consistency and transparency to the assessment process, the table below indicates the criteria that are proposed to guide the judgement as to the sensitivity of the landscape character areas and the various visual receptors in their interaction with the identified LCAs.

SENSITIVITY	LCA	RECEPTORS
Low	Areas not recognised as having specific landscape value. The Urban and the Industrial LCAs;	Viewer's attention not focused on landscape. These include: • Residents of urban areas
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: • The Rural LCA.	Viewers' attention may be focused on landscape. These include: • The N2 and the R327; • Homesteads; • One Stop and Petroport; • Reed Valley; and • Users of main and local roads.
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or

SENSITIVITY	LCA	RECEPTORS
	character is susceptible to relatively small changes. There are no landscape character areas with a high significance.	location in a highly valued landscape could elevate viewer sensitivity to the highest level. There are no receptors that are likely to have a high sensitivity.

3.8 SITE SENSITIVITY

Site sensitivity (**Map 4**) is largely related to the protection of views for sensitive receptors

The closest receptors are likely to be motorists on the R327 which runs along the eastern boundary, as well as visitors to Reed Valley which is also to the east of the proposed site.

The existing Mossdustria development to the north of the proposed extension has as buffer of approximately 30m between the road edge and the edge of development. Even though vegetation within the buffer is not continuous, it does fulfil the function of softening the development edge as seen from the road.

It is proposed that a similar 30m wide buffer area is incorporated into the proposed site and that existing trees are retained and augmented with additional screen planting.

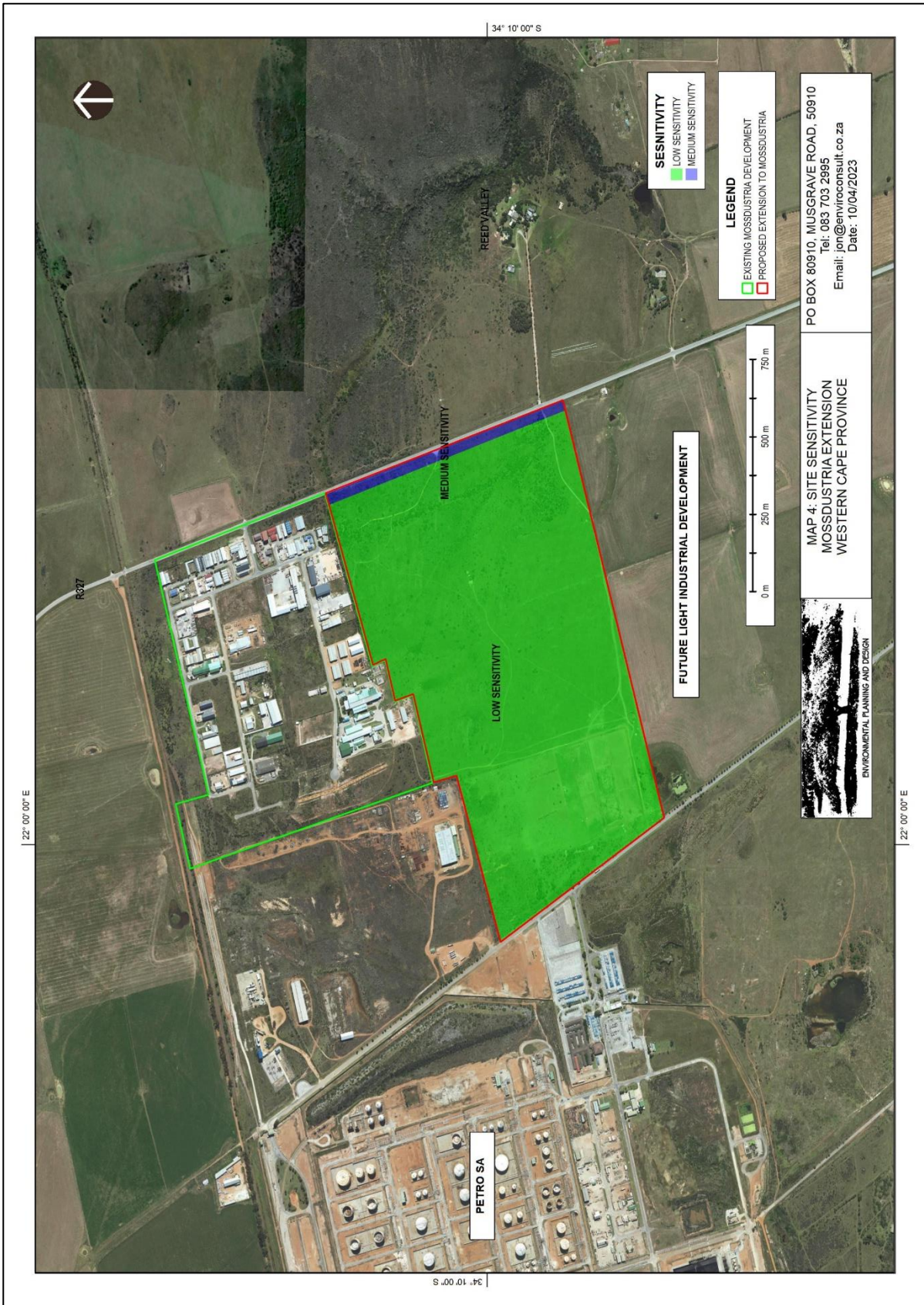
There are no Landscape and Visual No-Go areas or Highly Sensitive areas of site.

3.8.1 Medium Sensitivity Areas

Medium Sensitive Areas include the 30m buffer on the eastern boundary of the site. The retention of existing trees and planting existing vegetation to screen / visually soften the development as seen from the R327 and Reed Valley will minimise visual impacts for sensitive receptors.

3.8.2 Low Sensitivity Areas

The remainder of the proposed site is not sensitive from a Landscape and Visual perspective.



4 BRIEF ASSESSMENT OF LIKELY LANDSCAPE AND VISUAL IMPACTS

This section provides an indication of the affected landscape associated with the development proposal. It highlights potential sensitive receptors, defines the Zones of Theoretical Visibility, assesses the impact of the proposed deviations and compares the impacts with the impacts of the proposed (authorised) alignment.

4.1 VISIBILITY, ZTV ANALYSIS

Zones of Theoretical Visibility (ZTV) are defined as “a map usually digitally produced showing areas of land within which a development is theoretically visible⁵”.

ZTV s of the proposed development have been assessed using a GIS viewshed tool.

The assessment is based on terrain data that has been derived from satellite imagery. This data was originally prepared by NASSA and is freely available on the CIAT-CCAFS website (<http://www.cgiar-csi.org>). This data has been ground truthed using a GPS as well as an online mapping programme.

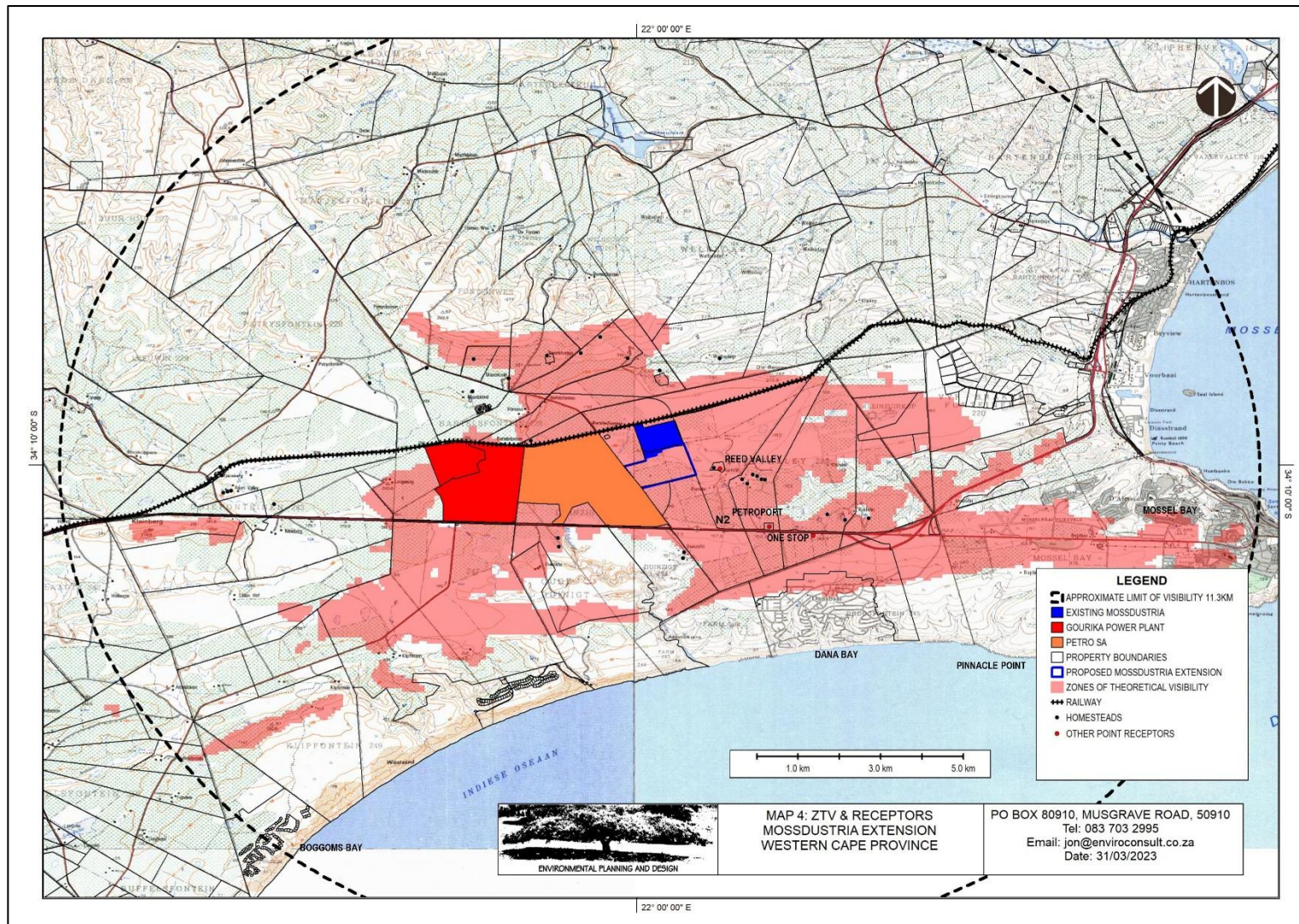
Whilst the ZTV has been calculated from terrain data only, existing vegetation and development could have a significant modifying effect on the areas indicated.

The ZTV analysis is indicated on Map 4.

The ZTV indicates:

- The proposed development is likely to be visible largely to the section of the coastal plain that is already impacted by heavy industry. It will be screened from inland areas by the ridgeline to the north and from coastal areas by the steep coastal slope;
- The proposed development will not be visible to coastal settlement;
- The proposed development could be visible to approximately 10km of the N2;
- The proposed development will be visible from the R327;
- The proposed development will be visible to the One Stop Service Station on the N2;
- The proposed development could be visible to the western edge of the western suburbs and the Kwanonqaba settlement area;
- The proposed development could be visible to the approximately 15 individual homesteads including Reed Valley and associated buildings; and
- The proposed development is likely to be visible to the remaining land between the N2 and Mossdustria. It was noted that this area was for sale for industrial development at the time of the site inspection. It is reported that an Environmental Authorisation has been granted for light industrial development on this site.

⁵ UK Guidelines



4.2 BRIEF ASSESSMENT OF IMPACTS

See Appendix IV for detailed assessment

4.2.1 Landscape Impact

The impact was assessed as **Very Low Negative** with and without mitigation.

The affected landscape is already impacted by light and heavy industry.

The adjacent land to the north is already developed with light industry.

The adjacent land to the south of the proposed development appears to be for sale for industrial development and has received environmental authorisation for light industrial development. If this should occur then the proposed development is likely to be largely screened from the north and the south.

The proposed development will extend the influence of industry within the affected landscape but it is unlikely to change the overall landscape character.

Mitigation should include:

- The use of colour is also likely to have an influence on the nature and degree of the impact. The use of bright colours that contrast with the natural colours of the landscape is likely to make the development visually prominent. Bright contrasting colours should therefore be avoided.

4.2.2 Impact on Views from the N2

The impact was assessed as **Very Low Negative** with and without mitigation.

The proposed development will result in industry being located closer to the N2 than it currently is. However, there will still be a buffer of open / agricultural land between the road and the development. It must also be noted that the land to the south of the site is advertised for sale and has an environmental authorization in place for light industrial development.

Without mitigation therefore, the nature of the view from the road will not change significantly but the nature of development is likely to become slightly clearer.

Mitigation should include:

- Development of the intervening land between the proposed development and the N2. It is understood that this is planned. Should this occur, the proposed development is unlikely to be visible from the road; or
- The proposed development includes spectator stands that will face away from the road which is likely to result in a tall vertical rear structure of the stands being the most obvious elements seen from the road. Screening of the southern edge of the development and particularly these elements with tree planting is likely to help minimize the impact.
- The use of colour is also likely to have an influence on the nature and degree of the impact. The use of bright colours that contrast with the natural colours of the landscape is likely to make the development visually prominent. Bright contrasting colours should therefore be avoided.

4.2.3 Impact on Views from the R327

The impact was assessed as **Moderate Negative** without mitigation and **Very Low Negative** with mitigation.

The proposed development could be visible to approximately 6m of this road. For 4km of the road that runs to the north of the development site, views will either be screened by existing Mossdustria development or from higher sections of the road, views may be possible over existing development.

For approximately 2km of the road to the east of the development site the development is likely to be highly obvious as the road runs immediately adjacent to the eastern boundary.

Mitigation should include:

Maintaining a 30m wide buffer and augmenting existing trees on the eastern boundary of the proposed site and along the R327 in order to visually soften views of the development from the east.

4.2.4 Impact on Views from Homesteads

The impact was assessed as **Very Low Negative**.

The proposed development could be visible from approximately 15 rural homesteads. The closest homestead is Reed Valley which is just over 500m from the eastern boundary of the proposed development. The buildings on this property are surrounded by dense trees so views towards the proposed development will be largely screened.

Six of the homesteads are located north of the development. From these properties views will be largely blocked by the existing Mossdustria development. It may be that higher properties may have a view over existing development. From these buildings, the proposed development will appear to be part of the existing development.

After Reed Valley, the next closest homestead is approximately 1km from the eastern boundary of the proposed development. Between this homestead and the proposed development there are numerous individual and groups of trees that are likely to partially screen the proposed development.

Mitigation should include:

Maintaining and augmenting existing trees close to the eastern boundary of the proposed site and along the R327 in order to visually soften views of the development from the east.

4.2.5 Impact on Views from the Western Suburbs and the Kwanonqaba Settlement

The impact was assessed as **Very Low Negative**.

The proposed development will result in industry being located closer to the settlement area than it currently is. However, at its closest the development will be approximately 5km from the settlement area and there will still be a buffer of open / agricultural land in front of the development.

Therefore, the nature of the view from the settlement will not change significantly. With mitigation, there will be no change due to the proposed development.

Mitigation should include:

- Development of the intervening land between the proposed development and the N2. It is understood that this is planned and authorised. Should this occur, the proposed development is unlikely to be visible from the western suburbs;
- The development includes spectator stands that will face away from the proposed development which is likely to result in a tall vertical rear structure of the stands being the most obvious elements. Screening of the southern edge of the development and particularly these elements with tree planting is likely to help minimize the impact;
- Screening on the eastern boundary of the site; and
- The use of colour is also likely to have an influence on the nature and degree of the impact. The use of bright colours that contrast with the natural colours of the landscape is likely to make the development visually prominent. Bright contrasting colours should therefore be avoided.

4.2.6 Impact on Views from the Petroport Service Station on the East Bound Lane of the N2

The impact was assessed as **Very Low Negative**.

Petroport on the east bound lane is the closer of two local service stations to the proposed development. The other service station is a One Stop which is approximately 1km further east off the west bound lane.

The proposed development will result in industry being located closer to the service station than it currently is. However, at its closest the development will be approximately 2km from the settlement area and there will still be a buffer of open / agricultural land in front of the development.

Therefore, the nature of the view from the settlement will not change significantly. With mitigation, there will be no change due to the proposed development.

Mitigation should include:

- Development of the intervening land between the proposed development and the N2. It is understood that this is planned. Should this occur, the proposed development is unlikely to be visible from the western suburbs;
- The proposed development includes spectator stands that will face away from the proposed development which is likely to result in a tall vertical rear structure of the stands being the most obvious elements. Screening of the southern edge of the development and particularly these elements with tree planting is likely to help minimize the impact; and
- The use of colour is also likely to have an influence on the nature and degree of the impact. The use of bright colours that contrast with the natural colours of the landscape is likely to make the development visually prominent. Bright contrasting colours should therefore be avoided.

5 IMPACT STATEMENT

5.1 EXISTING LANDSCAPE

The following landscape character areas were identified:

The Urban LCA which includes urban areas indicated on the landcover map. These are generally residential areas close to the coast, most of which are screened from the development by landform. One area, Kwanonqaba, has the potential for residents to have long distance views of the proposed development particularly from the western edge;

The Rural LCA which includes the commercial cultivation, low herb land and natural grassland that generally surrounds the proposed development; and

Industrial LCA which includes the area of heavy industry adjoining the proposed development area. This includes the existing Mossdustria development, Petro SA and the Gourika Power Generation facility.

5.2 VISUAL RECEPTORS

Area Receptors:

- Settlement Areas, the only areas that are likely to be affected are those areas that extend onto the plateau including Kwanonqaba and the western suburbs of Mossel Bay.

Linear Receptors:

Linear receptors generally include routes through the area:

- The N2 which is the main regional arterial route that links Cape Town to the south with Durban to the north. In addition to its importance for business, this is an important tourism route.
- The R327 runs in a north-west – south-easterly direction. It is suspected that this road is mainly important for local connectivity.
- The railway, from internet research, there does not appear to be a passenger train that uses the railway line west of Mossel Bay. It is therefore unlikely that the rail line will be sensitive to the proposed development.

Point Receptors:

- Homesteads within the surrounding area.
- The Reed Valley venue that is located close and to the east of the proposed development site. This venue advertises wine tasting, a restaurant and music events. The venue is located approximately 500m east of the R327 and is set amongst a densely treed area.
- The One Stop and Petroport service areas on the N2. These facilities are used by travellers on the N2 including tourists. The Petroport facility is closest to the proposed development (approximately 2km).

5.3 LANDSCAPE & RECEPTOR SENSITIVITY

SENSITIVITY	LCA	RECEPTORS
Low	Areas not recognised as having specific landscape value. The Urban and the Industrial LCAs;	Viewer's attention not focused on landscape. These include: • Residents of urban areas
Medium	Landscape value is recognised locally, but is not protected; the landscape is relatively intact, with a distinctive character; and the landscape is reasonably tolerant of change. These areas include: • The Rural LCA.	Viewers' attention may be focused on landscape. These include: • The N2 and the R327; • Homesteads; • One Stop and Petroport; • Reed Valley; and • Users of main and local roads.
High	The qualities for which the landscape is valued are in a good condition, with a clearly apparent distinctive character. This distinctive character is susceptible to relatively small changes. There are no landscape character areas with a high significance.	Viewer's attention very likely to be focused on landscape, e.g. people experiencing views from important landscape features of local physical, cultural or historic interest and beauty spots. Large number of viewers and/or location in a highly valued landscape could elevate viewer sensitivity to the highest level. There are no receptors that are likely to have a high sensitivity.

5.4 LIKELY VISIBILITY AND AREAS OF POSSIBLE IMPACT

- The proposed development is likely to be visible largely to the section of coastal plain that is already impacted by heavy industry. It will be screened from inland areas by the ridgeline to the north and from coastal areas by the steep coastal slope;
- The proposed development will not be visible to coastal settlement;
- The proposed development could be visible to approximately 10km of the N2;
- The proposed development will be visible from the R327;
- The proposed development will be visible to the One Stop Service Station on the N2;
- The proposed development could be visible to the western edge of the western suburbs of Mossel Bay and the Kwanonqaba settlement area;
- The proposed development could be visible to the approximately 15 individual homesteads including Reed Valley and associated buildings; and

- The proposed development is likely to be visible to the remaining land between the N2 and Mossdustria. It was noted that this area was for sale for industrial development at the time of the site inspection.

With mitigation likely landscape and visual impacts will have a low to negligible significance.

5.5 CONCLUSION

Due to the likely relatively low levels of landscape and visual impact, there is no reason from a landscape and visual impact perspective why the proposed development should not be authorised.

REFERENCES

Landscape Institute and Institute of Environmental Management Assessment. 2013. *Guidelines for landscape and visual impact assessment*. Oxon, UK:

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Mucina, L. & Rutherford, M.C. (eds.), 2006, *The vegetation of South Africa, Lesotho and Swaziland*, South African National Biodiversity Institute, Pretoria (Strelitzia series; no. 19).

APPENDIX I

SPECIALIST'S BRIEF CV



Name JONATHAN MARSHALL
Nationality British
Year of Birth 1956
Specialisation Landscape Architecture / Landscape & Visual Impact Assessment / Environmental Planning / Environmental Impact Assessment.

Qualifications
Education Diploma in Landscape Architecture, Gloucestershire College of Art and Design, UK (1979)
 Environmental Law, University of KZN (1997)
Professional Registered Professional Landscape Architect (SACLAP)
 Chartered Member of the Landscape Institute (UK)
 Member of the International Association of Impact Assessment, South Africa

Languages English - Speaking - Excellent
 - Reading - Excellent
 - Writing - Excellent

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General

Jon qualified as a Landscape Architect (Dip LA) at Cheltenham (UK) in 1979. He has been a chartered member of the Landscape Institute UK since 1986. He is also a Registered Landscape Architect and has had extensive experience as an Environmental Assessment Practitioner within South Africa.

During the early part of his career (1981 - 1990) He worked with Clouston (now RPS) in Hong Kong and Australia. During this period he was called on to undertake visual impact assessment (VIA) input to numerous environmental assessment processes for major infrastructure projects. This work was generally based on photography with line drawing superimposed to illustrate the extent of development visible.

He has worked in the United Kingdom (1990 - 1995) for major supermarket chains including Sainsbury's and prepared CAD based visual impact assessments for public enquiries for new store development. He also prepared the VIA input to the environmental statement for the Cardiff Bay Barrage for consideration by the UK Parliament in the passing of the Barrage Act (1993).

His more recent VIA work (1995 to present) includes a combination of CAD and GIS based work for a new international airport to the north of Durban, new heavy industrial operations, overhead electrical transmission lines, mining operations in West Africa and numerous commercial and residential developments.

VIA work undertaken during the last twelve months includes wind energy projects, numerous solar plant projects (CSP and PV) and electrical infrastructure.

Select List of Visual Impact Assessment Projects

- **Geelkop Solar PV projects** – Landscape and Visual Impact Assessment for seven proposed solar PV projects near Upington in the Northern Cape Province for Atlantic Renewable Energy Partners.
- **Makapanstad Agri- Hub** – Landscape and Visual Impact Assessment for proposed Agri-Hub development at Makapanstad in the North West Province for the Department of Rural Development and Land Reform.
- **Madikwe Sky Bubble** - Landscape and Visual Impact Assessment for proposed development of up-market accommodation at the Molori concession within the Madikwe Game Reserve.
- **Hartebeest Wind Energy Facility** – Landscape and Visual Impact Assessment Addendum Report for the proposed upgrading of turbine specifications for an authorised WEF near MoOrreesburg in the Western Cape Province for a private client.
- **Selati Railway Bridge** - Landscape and Visual Impact Assessment for proposed development of up-market accommodation on a railway bridge at Skukuza in the Kruger Park.
- **Kangala Mine Extension** - Landscape and Visual Impact Assessment for a proposed extension to the Kangala Mine in Mpumalanga for Universal Coal.
- **Khunab Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for a private client.
- **Sirius Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Upington in the Northern Cape Province for Sola Future Energy.
- **Aggeneys Solar Developments** – Landscape and Visual Impact Assessment for two proposed solar PV projects near Aggeneys in the Northern Cape Province for a private client.
- **Hyperion Solar Developments** – Landscape and Visual Impact Assessment for four proposed solar PV projects near Kathu in the Northern Cape Province for Building Energy South Africa.
- **Eskom Combined Cycle Power Plant** - Landscape and Visual Impact Assessment for proposed gas power plant in Richards Bay, KwaZulu Natal Province.
- **N2 Wild Coast Toll Road, Mineral Sources and Auxiliary Roads** – VIA for the Pondoland Section of this project for the South African National Roads Agency.
- **Mpushini Park Ashburton** – VIA for a proposed amendment to an authorised development plan which included residential, office park and light industrial uses to logistics and warehousing.
- **Moedeng PV Solar Project** - VIA for a solar project near Vryburg in the North West Province for a private client.
- **Establishment of Upmarket Tourism Accommodation on the Selati Bridge, Kruger National Park** – Assessment of visual implications of providing tourism accommodation in 12 railway carriages on an existing railway bridge at the Skukuza Rest Camp in the Kruger Park.
- **Jozini TX Transmission Tower** – Assessment of visual implications of a proposed MTN transmission tower on the Lebombo ridgeline overlooking the Pongolapoort Nature reserve and dam.
- **Bhangazi Lake Development** – Visual Impact Assessment for a proposed tourism development within the iSimangaliso Wetland Park World Heritage Site.
- **Palesa Power Station** - VIA for a new 600MW power station near Kwamhlanga in Mpumalanga for a private client.
- **Heuningklip PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Kruispad PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Doornfontein PV Solar Project** – VIA for a solar project in the Western Cape Province for a private client.
- **Olifantshoek Power Line and Substation** – VIA for a new 10MVA 132/11kV substation and 31km powerline, Northern Cape Province, for Eskom.

- **Noupoort Concentrating Solar Plants** - Scoping and Visual Impact Assessments for two proposed parabolic trough projects.
- **Drakensberg Cable Car** – Preliminary Visual Impact Assessment and draft terms of reference as part of the feasibility study.
- **Paulputs Concentrating Solar Plant (tower technology)** – Visual Impact Assessment for a new CSP project near Pofadder in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5** – Scoping and Visual Impact Assessments for the proposed extension of five authorised CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Ilanga Concentrating Solar Plants 1, 2, 3, 4 & 5 Shared Infrastructure** –Visual Impact Assessment for the necessary shared infrastructure including power lines, substation, water pipeline and roads for these projects.
- **Ilanga Concentrating Solar Plants 7, 8 & 9** - Scoping and Visual Impact Assessments for three new CSP projects including parabolic trough and tower technology within the Karoshoek Solar Valley near Upington in the Northern Cape.
- **Sol Invictus Solar Plants** - Scoping and Visual Impact Assessments for three new Solar PV projects near Pofadder in the Northern Cape.
- **Gunstfontein Wind Energy Facility** – Scoping and Visual Impact Assessment for a proposed WEF near Sutherland in the Northern Cape.
- **Moorreesburg Wind Energy Facility** – Visual Impact Assessment for a proposed WEF near Moorreesburg in the Western Cape.
- **Semonkong Wind Energy Facility** - Visual Impact Assessment for a proposed WEF near Semonkong in Southern Lesotho.
- **Great Karoo Wind Energy Facility** – Addendum report to the Visual Impact Assessment Report for amendment to this authorised WEF that is located near Sutherland in the Northern Cape. Proposed amendments included layout as well as rotor diameter.
- **Perdekraal East Power Line** – Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Sutherland in the Northern Cape.
- **Tshivhaso Power Station** – Scoping and Visual Impact Assessment for a proposed new power station near Lephalale in Limpopo Province.
- **Saldanha Eskom Strengthening** – Scoping and Visual Impact Assessment for the upgrading of strategic Eskom infrastructure near Saldanha in the Western Cape.
- **Eskom Lethabo PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Lethabo Power Station in the Free State.
- **Eskom Tuthuka PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Thutuka Power Station in Mpumalanga.
- **Eskom Majuba PV Installation** - Scoping and Visual Impact Assessment for the development of a solar PV plant within Eskom's Majuba Power Station in Mpumalanga.
- **Golden Valley Power Line** - Visual Impact Assessment for a proposed power line to evacuate power from a wind energy facility near Cookhouse in the Eastern Cape.
- **Mpophomeni Shopping Centre** – Visual impact assessment for a proposed new shopping centre close to the southern shore of Midmar Dam in KwaZulu Natal.
- **Rheebokfontein Power Line** - Addendum report to the Visual Impact Assessment Report for amendment to this authorised power line alignment located near Darling in the Western Cape.
- **Woodhouse Solar Plants** – Scoping and Visual Impact Assessment for two proposed solar PV projects near Vryburg in the North West Province.
- **AngloGold Ashanti, Dokyiwa (Ghana)** – Visual Impact Assessment for proposed new Tailings Storage Facility at a mine site working with SGS as part of their EIA team.
- **Gateway Shopping Centre Extension (Durban)** – Visual Impact Assessment for a proposed

shopping centre extension in Umhlanga, Durban.

- **Kouroussa Gold Mine (Guinea)** – Visual impact assessment for a proposed new mine in Guinea working with SGS as part of their EIA team.
- **Mampon Gold Mine (Ghana)** - Visual impact assessment for a proposed new mine in Ghana working with SGS as part of their EIA team.
- **Telkom Towers** – Visual impact assessments for numerous Telkom masts in KwaZulu Natal.
- **Eskom Isundu Substation** – Visual Impact Assessment for a proposed major new Eskom substation near Pietermaritzburg in KwaZulu Natal.
- **Eskom St Faiths Power Line and Substation** – Visual Impact Assessment for a major new substation and associated power lines near Port Shepstone in KwaZulu Natal.
- **Eskom Ficksburg Power Line** – Visual Impact Assessment for a proposed new power line between Ficksburg and Cocolan in the Free State.
- **Eskom Matubatuba to St Lucia Power Line** – Visual Impact Assessment for a proposed new power line between Mtubatuba and St Lucia in KwaZulu Natal.
- **Dube Trade Port, Durban International Airport** – Visual Impact Assessment
- **Sibaya Precinct Plan** – Visual Impact Assessment as part of Environmental Impact Assessment for a major new development area to the north of Durban.
- **Umdloti Housing** – Visual Impact Assessment as part of Environmental Impact Assessment for a residential development beside the Umdloti Lagoon to the north of Durban.
- **Tata Steel Ferrochrome Smelter** - Visual impact assessment of proposed new Ferrochrome Smelter in Richards Bay as part of EIA undertaken by the CSIR.
- **Durban Solid Waste Large Landfill Sites** – Visual Impact Assessment of proposed development sites to the North and South of the Durban Metropolitan Area. The project utilised 3d computer visualisation techniques.
- **Hillside Aluminium Smelter, Richards Bay** - Visual Impact Assessment of proposed extension of the existing smelter. The project utilised 3d computer visualisation techniques.
- **Estuaries of KwaZulu Natal Phase 1** – Visual character assessment and GIS mapping as part of a review of the condition and development capacity of eight estuary landscapes for the Town and Regional Planning Commission. The project was extended to include all estuaries in KwaZulu Natal.
- **Signage Assessments** – Numerous impact assessments for proposed signage developments for Blast Media.
- **Signage Strategy** – Preparation of an environmental strategy report for a national advertising campaign on National Roads for Visual Image Placements.
- **Zeekoegatt, Durban** - Computer aided visual impact assessment. EDP acted as advisor to the Province of KwaZulu Natal in an appeal brought about by a developer to extend a light industrial development within a 60 metre building line from the National N3 Highway.
- **La Lucia Mall Extension** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed extension to shopping mall for public consultation exercise.
- **Redhill Industrial Development** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed new industrial area for public consultation exercise.
- **Avondale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Hammersdale Reservoir** - Visual impact assessment using three dimensional computer modelling / photo realistic rendering and montage techniques for proposed hilltop reservoir as part of Environmental Impact Assessment for Umgeni Water.
- **Southgate Industrial Park, Durban** - Computer Aided Visual Impact Assessment and Landscape

Design for AECl.

- **Sainsbury's Bryn Rhos** - Computer Aided Visual Impact Assessment/ Planning Application for the development of a new store within the Green Wedge North of Swansea.
- **Ynyston Farm Access** - Computer Aided Impact Assessment of visual intrusion of access road to proposed development of Cardiff for the Land Authority for Wales.
- **Cardiff Bay Barrage** – Preparation of the Visual Impact Statement for inclusion in the Impact Statement for debate by parliament (UK) prior to the passing of the Cardiff Bay Barrage Bill.
- **A470, Cefn Coed to Pentrebach** - Preparation of landscape frameworks for the assessment of the impact of the proposed alignment on the landscape for The Welsh Office.
- **Sparkford to Ilchester Bye Pass** - The preparation of the landscape framework and the draft landscape plan for the Department of Transport.
- **Green Island Reclamation Study** - Visual Impact Assessment of building massing, Urban Design Guidelines and Masterplanning for a New Town extension to Hong Kong Island.
- **Route 3** - Visual Impact Assessment for alternative road alignments between Hong Kong Island and the Chinese Border.
- **China Border Link** - Visual Impact Assessment and initial Landscape Design for a new border crossing at Lok Ma Chau.
- **Route 81, Aberdeen Tunnel to Stanley** - Visual Impact Assessment for alternative highway alignments on the South side of Hong Kong Island.

APPENDIX II

GUIDELINES FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

(Preface, Summary and Contents for full document go to the Provincial Government of the Western Cape, Department of Environmental Affairs and Development Planning web site, <http://eadp.westerncape.gov.za/your-resource-library/policies-guidelines>)

GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES



PROVINCIAL GOVERNMENT OF THE WESTERN CAPE:
DEPARTMENT OF ENVIRONMENTAL AFFAIRS
AND DEVELOPMENT PLANNING



CSIR

Edition 1
June 2005

GUIDELINE FOR INVOLVING VISUAL AND AESTHETIC SPECIALISTS IN EIA PROCESSES

Edition 1

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PREFACE

The purpose of an Environmental Impact Assessment (EIA) is to provide decision-makers (be they government authorities, the project proponent or financial institutions) with adequate and appropriate information about the potential positive and negative impacts of a proposed development and associated management actions in order to make an informed decision whether or not to approve, proceed with or finance the development.

For EIA processes to retain their role and usefulness in supporting decision-making, the involvement of specialists in EIA needs to be improved in order to:

- Add greater value to project planning and design;
- Adequately evaluate reasonable alternatives;
- Accurately predict and assess potential project benefits and negative impacts;
- Provide practical recommendations for avoiding or adequately managing negative impacts and enhancing benefits;
- Supply enough relevant information at the most appropriate stage of the EIA process to address adequately the key issues and concerns, and effectively inform decision-making in support of sustainable development.

It is important to note that not all EIA processes require specialist input; broadly speaking, specialist involvement is needed when the environment could be significantly affected by the proposed activity, where that environment is valued by or important to society, and/or where there is insufficient information to determine whether or not unavoidable impacts would be significant.

The purpose of this series of guidelines is to improve the efficiency, effectiveness and quality of specialist involvement in EIA processes. The guidelines aim to improve the capacity of roleplayers to anticipate, request, plan, review and discuss specialist involvement in EIA processes. Specifically, they aim to improve the capacity of EIA practitioners to draft appropriate terms of reference for specialist input and assist all roleplayers in evaluating whether or not specialist input to the EIA process is appropriate for the type of development and environmental context. Furthermore, they aim to ensure that specialist inputs support the development of effective, practical Environmental Management Plans where projects are authorised to proceed (refer to *Guideline for Environmental Management Plans*).

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms “specialist involvement” and “input” have been used in preference to “specialist assessment” and “studies” to indicate that the scope of specialists’ contribution (if required) depends on the nature of the project, the environmental context and the amount of available information and does not always entail detailed studies or assessment of impacts.

The guidelines draw on best practice in EIA in general, and within specialist fields of expertise in particular, to address the following issues related to the timing, scope and quality of specialist input. The terms “specialist involvement” and “input” have been used in preference to “specialist

assessment” and “studies” to indicate that the scope of specialists’ contribution depends on the nature of the project, the environmental context and the amount of available information.

	ISSUES
TIMING	When should specialists be involved in the EIA process; i.e. at what stage in the EIA process should specialists be involved (if at all) and what triggers the need for their input?
SCOPE	- Which aspects must be addressed through specialist involvement; i.e. what is the purpose and scope of specialist involvement? - What are appropriate approaches that specialists can employ? - What qualifications, skills and experience are required?
QUALITY	- What triggers the review of specialist studies by different roleplayers? - What are the review criteria against which specialist inputs can be evaluated to ensure that they meet minimum requirements, are reasonable, objective and professionally sound?

The following guidelines form part of this first series of guidelines for involving specialists in EIA processes:

- Guideline for determining the scope of specialist involvement in EIA processes
- Guideline for the review of specialist input in EIA processes
- Guideline for involving biodiversity specialists in EIA processes
- Guideline for involving hydrogeologists in EIA processes
- Guideline for involving visual and aesthetic specialists in EIA processes
- Guideline for involving heritage specialists in EIA processes
- Guideline for involving economists in EIA processes

The *Guideline for determining the scope of specialist involvement in EIA processes* and the *Guideline for the review of specialist input in EIA processes* provide generic guidance applicable to any specialist input to the EIA process and clarify the roles and responsibilities of the different roleplayers involved in the scoping and review of specialist input. It is recommended that these two guidelines are read first to introduce the generic concepts underpinning the guidelines which are focused on specific specialist disciplines.

Who is the target audience for these guidelines?

The guidelines are directed at authorities, EIA practitioners, specialists, proponents, financial institutions and other interested and affected parties involved in EIA processes. Although the guidelines have been developed with specific reference to the Western Cape province of South Africa, their core elements are more widely applicable.

What type of environmental assessment processes and developments are these guidelines applicable to?

The guidelines have been developed to support project-level EIA processes regardless of whether they are used during the early project planning phase to inform planning and design decisions (i.e. during pre-application planning) or as part of a legally defined EIA process to obtain statutory approval for a proposed project (i.e. during screening, scoping and/or impact assessment). Where specialist input may be required the guidelines promote early, focused and appropriate involvement of specialists in EIA processes in order to encourage proactive consideration of potentially significant impacts, so that negative impacts may be avoided or

effectively managed and benefits enhanced through due consideration of alternatives and changes to the project.

The guidelines aim to be applicable to a range of types and scales of development, as well as different biophysical, social, economic and governance contexts.

What will these guidelines not do?

In order to retain their relevance in the context of changing legislation, the guidelines promote the principles of EIA best practice without being tied to specific legislated national or provincial EIA terms and requirements. They therefore do not clarify the specific administrative, procedural or reporting requirements and timeframes for applications to obtain statutory approval. They should, therefore, be read in conjunction with the applicable legislation, regulations and procedural guidelines to ensure that mandatory requirements are met.

It is widely recognized that no amount of theoretical information on how best to plan and coordinate specialist inputs, or to provide or review specialist input, can replace the value of practical experience of coordinating, being responsible for and/or reviewing specialist inputs. Only such experience can develop sound judgment on such issues as the level of detail needed or expected from specialists to inform decision-makers adequately. For this reason, the guidelines should not be viewed as prescriptive and inflexible documents. Their intention is to provide best practice guidance to improve the quality of specialist input.

Furthermore, the guidelines do not intend to create experts out of non-specialists. Although the guidelines outline broad approaches that are available to the specialist discipline (e.g. field survey, desktop review, consultation, modeling), specific methods (e.g. the type of model or sampling technique to be used) cannot be prescribed. The guidelines should therefore not be used indiscriminately without due consideration of the particular context and circumstances within which an EIA is undertaken, as this influences both the approach and the methods available and used by specialists.

How are these guidelines structured?

The specialist guidelines have been structured to make them user-friendly. They are divided into six parts, as follows:

- **Part A:** Background;
- **Part B:** Triggers and key issues potentially requiring specialist input;
- **Part C:** Planning and coordination of specialist inputs (drawing up terms of reference);
- **Part D:** Providing specialist input;
- **Part E:** Review of specialist input; and
- **Part F:** References.

Part A provides grounding in the specialist subject matter for all users. It is expected that authorities and peer reviewers will make most use of Parts B and E; EIA practitioners and project proponents Parts B, C and E; specialists Part C and D; and other stakeholders Parts B, D and E. Part F gives useful sources of information for those who wish to explore the specialist topic.

SUMMARY

This guideline document, which deals with specialist visual input into the EIA process, is organised into a sequence of interleaving sections. These follow a logical order covering the following:

- the background and context for specialist visual input;
- the triggers and issues that determine the need for visual input;
- the type of skills and scope of visual inputs required in the EIA process;
- the methodology, along with information and steps required for visual input;
- finally, the review or evaluation of the visual assessment process.

Part A is concerned with defining the visual and aesthetic component of the environment, and with principles and concepts relating to the visual assessment process. The importance of the process being logical, holistic, transparent and consistent is stressed in order for the input to be useful and credible.

The legal and planning context within which visual assessments take place indicate that there are already a number of laws and bylaws that protect visual and scenic resources. These resources within the Western Cape context have importance for the economy of the region, along with the proclaimed World Heritage Sites in the Province.

The role and timing of specialist visual inputs into the EIA process are outlined, with the emphasis being on timely, and on appropriate level of input, from the early planning stage of a project, through to detailed mitigation measures and

management controls at the implementation stage.

Part B deals with typical factors that trigger the need for specialist visual input to a particular project. These factors typically relate to:

- (a) the nature of the receiving environment, in particular its visual sensitivity or protection status;
- (b) the nature of the project, in particular the scale or intensity of the project, which would result in change to the landscape or townscape.

The correlation between these two aspects are shown in a table, in order to determine the varying levels of visual impact that can be expected, i.e. from little or no impact, to very high visual impact potential.

Part C deals with the choice of an appropriate visual specialist, and the preparation of the terms of reference (TOR) for the visual input. Three types of visual assessment are put forward, each requiring different expertise, namely:

- Type A: assessments involving large areas of natural or rural landscape;
- Type B: assessments involving local areas of mainly built environment;
- Type C: assessments involving smaller scale sites with buildings, or groups of buildings.

The scope of the visual input would in summary relate to the following:

- the issues raised during the scoping process;
- the time and space boundaries, i.e. the extent or zone of visual influence;

- the types of development alternatives that are to be considered;
- the variables and scenarios that could affect the visual assessment;
- the inclusion of direct, indirect and cumulative effects.

Approaches to the visual input relate to the level of potential impact and range from minimal specialist input, to a full visual impact assessment (VIA). A list of the typical components of a visual assessment is given, and the integration with other studies forming part of the EIA process is discussed.

Part D provides guidance for specialist visual input, and on the information required by specialists. Notes on predicting potential visual impacts are given, along with suggested criteria for describing and rating visual impacts. The assessment of the overall significance of impacts, as well as thresholds of significance are discussed.

Further aspects that need to be considered by visual specialists in EIA processes include:

- affected parties who stand to benefit or lose,
- risks and uncertainties related to the project,
- assumptions that have been made, and their justification,
- levels of confidence in providing the visual input or assessment,
- management actions that can be employed to avoid or mitigate adverse effects and enhance benefits, and
- the best practicable environmental option from the perspective of the visual issues and impacts.

Finally, pointers for the effective communication of the findings are given.

Part E lists specific evaluation criteria for reviewing visual input by a specialist, where this becomes necessary. Further guidance on this is given in the document on *Guideline for the review of specialist input in EIA processes*.

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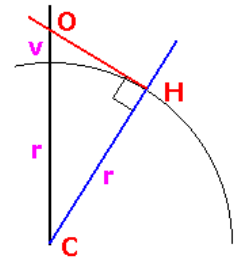
APPENDIX III

FORMULA FOR DERIVING THE APPROXIMATE VISUAL HORIZON

The Mathematics behind this Calculation

This calculation should be taken as a guide only as it assumes the earth is a perfect ball 6378137 metres radius. It also assumes the horizon you are looking at is at sea level. A triangle is formed with the centre of the earth (C) as one point, the horizon point (H) is a right angle and the observer (O) the third corner. Using Pythagoras's theorem we can calculate the distance from the observer to the horizon (OH) knowing CH is the earth's radius (r) and CO is the earth's radius (r) plus observer's height (v) above sea level.

Sitting in a hotel room 10m above sea level a boat on the horizon will be 11.3km away. The reverse is also true, whilst rowing across the Atlantic, the very top of a mountain range 400m high could be seen on your horizon at a distance of 71.4 km assuming the air was clear enough.



APPENDIX IV
DETAILED ASSESSMENT METHODOLOGY

IMPACT ASSESSMENT METHODOLOGY

The objective of the assessment of potential impacts is to identify and assess all the significant, potential impacts that may arise as a result of the project.

For each of the main project phases the existing and potential future impacts and benefits (associated only with the project) will be described using the criteria listed below. The assignment of ratings has been undertaken based on past experience of the team, as well as through research. Subsequently, mitigation measures will be identified and considered for each impact and the assessment repeated in order to determine the significance of the residual impacts (the impact remaining after the mitigation measure has been implemented).

Table 1: Impact Assessment Criteria

Criteria	Rating Scales	Notes
Nature	Positive	An evaluation of the effect of the impact related to the proposed development
	Negative	
Extent	Footprint	The extent of the impact is rated as footprint as it only affects the area in which the proposed activity will occur
	Site	The extent of the impact is rated as site as it will affect only the development area
	Local	The extent of the impact is rated as Local as it affects the development area and adjacent properties
	Regional	The extent of the impact is rated as Regional as the effects of the impact extends beyond municipal boundaries
	National	The extent of the impact is rated as National as the effects of the impact extends beyond more than 2 regional/ provincial boundaries
	International	The extent of the impact is rated as International as the effect of the impact extends beyond country borders
Duration	Temporary	The duration of the activity associated with the impact will last 0-6 months and as such is rated as Temporary
	Short term	The duration of the activity associated with the impact will last 6-18 months and as such is rated as Short term
	Medium term	The duration of the activity associated with the impact will last 18 months-5 years and as such is rated as Medium term
	Long term	The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term
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.

Criteria	Rating Scales	Notes
	Moderate negative	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
	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	
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.
	Definite	It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.

Criteria	Rating Scales	Notes
Significance	Very high - negative	A function of Consequence and Likelihood
	High - negative	
	Moderate - negative	
	Low - negative	
	Very low	
	Low - positive	
	Moderate - positive	
	High - positive	
	Very high - positive	

Table 2: Impact Assessment Criteria and Rating Scales

Duration		Extent		Irreplaceable Resources		Severity		Consequence = (Duration + Extent + Irreplaceable Resources) x Severity		Likelihood		Significance (Consequence x Likelihood)		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					-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	

Ascribing Significance for Decision-Making

The best way of expressing these cost benefit implications for decision-making is to present them as risks. Risk is defined as the consequence (implication) of an event multiplied by the probability (likelihood)⁶ of that event. Many risks are accepted or tolerated on a daily basis because even if the consequence of the event is serious, the likelihood that the event will occur is low. A practical example is the consequence of a parachute not opening, is potentially death but the likelihood of such an event happening is so low that parachutists are prepared to take that risk and hurl themselves out of an airplane. The risk is low because the likelihood of the consequence is low even if the consequence is potentially severe.

It is also necessary to distinguish between the event itself (as the cause) and the consequence. Again using the parachute example, the consequence of concern in the event that the parachute does not open is serious injury or death, but it does not necessarily follow that if a parachute does not open that the parachutist will die.

Various contingencies are provided to minimise the likelihood of the consequence (serious injury or death) in the event of the parachute not opening, such as a reserve parachute. In risk terms this means distinguishing between the inherent risk (the risk that a parachutist will die if the parachute does not open) and the residual risk (the risk that the parachutist will die if the parachute does not open but with the contingency of a reserve parachute) i.e. the risk before and after mitigation.

Consequence

The ascription of significance for decision-making becomes then relatively simple. It requires the consequences to be ranked and likelihood to be defined of that consequence.

In **Table 3** below a scoring system for consequence ranking is shown. Two important features should be noted in the table, namely that the scoring doubles as the risk increases and that there is no equivalent 'high' score in respect of benefits as there is for the costs. This high negative score serves to give expression to the potential for a fatal flaw where a fatal flaw would be defined as an impact that cannot be mitigated effectively and where the associated risk is accordingly untenable. Stated differently, the high score on the costs, which is not matched on the benefits side, highlights that such a fatal flaw cannot be 'traded off' by a benefit and would render the proposed project to be unacceptable.

Table 3: Ranking of Consequence

Environmental Cost	Inherent risk
Human health – morbidity/ mortality, loss of species	High
Material reductions in faunal populations, loss of livelihoods, individual economic loss	Moderate – High
Material reductions in environmental quality – air, soil, water. Loss of habitat, loss of heritage, amenity	Moderate
Nuisance	Moderate – Low
Negative change – with no other consequences	Low
Environmental Benefits	Inherent benefit

⁶ Because 'probability' has a specific mathematical/empirical connotation the term 'likelihood' is preferred in a qualitative application and is accordingly the term used in this document.

Net improvement in human health and welfare	Medium – High
Improved environmental quality – air, soil, water. Improved individual livelihoods	Moderate
Economic development	Moderate – Low
Positive change – with no other benefits	Low

Likelihood

Although the principle is one of probability, the term 'likelihood' is used to give expression to a qualitative rather than quantitative assessment, because the term 'probability' tends to denote a mathematical/empirical expression. A set of likelihood descriptors that can be used to characterise the likelihood of the costs and benefits occurring, is presented in **Table 4** below.

Table 4: Likelihood Categories and Definitions

Likelihood Descriptors	Definitions
Highly unlikely	The possibility of the consequence occurring is negligible
Unlikely but possible	The possibility of the consequence occurring is low but cannot be discounted entirely
Likely	The consequence may not occur but a balance of probability suggests it will
Highly likely	The consequence may still not occur but it is most likely that it will
Definite	The consequence will definitely occur

It is very important to recognise that the likelihood question is asked twice. The first time the question is asked is the likelihood of the cause and the second as to the likelihood of the consequence. In the tables that follow the likelihood is presented of the cause and then the likelihood of the consequence is presented. A high likelihood of a cause does not necessarily translate into a high likelihood of the consequence. As such the likelihood of the consequence is not a mathematical or statistical 'average' of the causes but rather a qualitative estimate in its own right.

Residual Risk

The residual risk is then determined by the consequence and the likelihood of that consequence. The residual risk categories are shown in **Table 5** below where consequence scoring is shown in the rows and likelihood in the columns. The implications for decision-making of the different residual risk categories are shown in **Table 6** below.

Table 5: Residual Risk Categories

Consequence	High	Moderate	High	High	Fatally flawed	
	Moderate – high	Low	Moderate	High	High	High
	Moderate	Low	Moderate	Moderate	Moderate	Moderate
	Moderate – low	Low	Low	Low	Low	Moderate
	Low	Low	Low	Low	Low	Low
		Highly unlikely	Unlikely but possible	Likely	Highly likely	Definite
		Likelihood				

Table 6: Implications for Decision-Making of the different Residual Risk Categories

Rating	Nature of implication for Decision – Making
Low	Project can be authorised with low risk of environmental degradation
Moderate	Project can be authorised but with conditions and routine inspections
High	Project can be authorised but with strict conditions and high levels of compliance and enforcement
Fatally Flawed	The project cannot be authorised

DETAILED ASSESSMENT TABLES

LANDSCAPE CHANGE				
PROJECT PHASE	Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.			
DIRECT IMPACT	Change of character due to industrialisation of a Rural Landscape			
INDIRECT IMPACT				
CUMULATIVE IMPACT	Extension of landscape industrialisation			
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 IRREPLACEABLE RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-14	Very low - negative		
PROPOSED MITIGATION MEASURES				
The use of colours that blend with the natural landscape should be maximized. The use of bright colours that contrast with the natural landscape should be minimized.				
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	Slightly Detrimental	Definite

		<i>processes are minimally affected</i>		
IMPACT ON IRREPLACEABLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-14	Very low - negative		
CONFIDENCE LEVEL				
<i>High</i>				

INDUSTRIALISATION OF VIEWS FROM THE N2				
PROJECT PHASE	Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.			
DIRECT IMPACT	Change of character due to industrialisation of a Rural Landscape			
INDIRECT IMPACT				
CUMULATIVE IMPACT	Extension of landscape industrialisation			
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 IRREPLACEABLE RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-14	Very low - negative		
PROPOSED MITIGATION MEASURES				

<i>Development of the intervening land between the proposed development and the N2</i>				
<i>Screening of the southern edge of the development and particularly the rear of spectator stands with tree planting is likely to help minimize the impact.</i>				
<i>Screening on the eastern site boundary</i>				
<i>The use of colours that blend with the natural landscape should be maximized.</i>				
<i>The use of bright colours that contrast with the natural landscape should be minimized.</i>				
POST-MITIGATION				
DURATION	4	<i>The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term</i>	-7	2
EXTENT	3	<i>The extent of the impact is rated as Local as it affects the development area and adjacent properties</i>		
SEVERITY	-1	<i>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</i>	Slightly Detrimental	Definite
IMPACT ON IRREPLACEBLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-14 Very low - negative			
CONFIDENCE LEVEL				
High				

INDUSTRIALISATION OF VIEWS FROM THE R327				
PROJECT PHASE	<i>Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.</i>			
DIRECT IMPACT	<i>Change of character due to industrialisation of a Rural Landscape</i>			
INDIRECT IMPACT				
CUMULATIVE IMPACT	<i>Extension of landscape industrialisation</i>			
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	-14	3
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	Moderately Detrimental	Definite
IMPACT ON IRREPLACEBLE RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-42	Moderate - negative		
PROPOSED MITIGATION MEASURES				
Screening of the eastern edge of the development.				
The use of colours that blend with the natural landscape should be maximized.				
The use of bright colours that contrast with the natural landscape should be minimized.				
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 RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-14 Very low - negative			
CONFIDENCE LEVEL				
High				

INDUSTRIALISATION OF VIEWS FROM HOMESTEADS				
PROJECT PHASE	Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.			
DIRECT IMPACT	Change of character due to industrialisation of a Rural Landscape			
INDIRECT IMPACT				
CUMULATIVE IMPACT	Extension of landscape industrialisation			
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	Likely
IMPACT ON IRREPLACEBLE RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-7	Very low - negative		
PROPOSED MITIGATION MEASURES				
Development of the intervening land between the proposed development and the N2				
Screening of the eastern edge of the development.				
The use of colours that blend with the natural landscape should be maximized.				
The use of bright colours that contrast with the natural landscape should be minimized.				
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			
SEVERITY	-1	<i>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</i>	Slightly Detrimental	Definite
IMPACT ON IRREPLACEBLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-14	Very low - negative		
CONFIDENCE LEVEL				
High				

INDUSTRIALISATION OF VIEWS FROM THE WESTERN SUBURBS AND THE KWANONQABA SETTLEMENT				
PROJECT PHASE	<i>Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.</i>			
DIRECT IMPACT	<i>Change of character due to industrialisation of a Rural Landscape</i>			
INDIRECT IMPACT				
CUMULATIVE IMPACT	<i>Extension of landscape industrialisation</i>			
DIMENSION	RATING	MOTIVATION	CONSEQUENCE	LIKELIHOOD
PRE-MITIGATION				
DURATION	4	<i>The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term</i>	-7	1
EXTENT	3	<i>The extent of the impact is rated as Local as it affects the development area and adjacent properties</i>		
SEVERITY	-1	<i>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</i>	Moderately Detrimental	Unlikely

		<i>processes are minimally affected</i>		
IMPACT ON IRREPLACEABLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-7	Very Low - negative		
PROPOSED MITIGATION MEASURES				
<i>Screening of the eastern edge of the development.</i>				
<i>Screening on the southern edge of the development</i>				
<i>The use of colours that blend with the natural landscape should be maximized.</i>				
<i>The use of bright colours that contrast with the natural landscape should be minimized.</i>				
POST-MITIGATION				
DURATION	4	<i>The duration of the activity associated with the impact will last more than 5 years and as such is rated as Long Term</i>	-7	2
EXTENT	3	<i>The extent of the impact is rated as Local as it affects the development area and adjacent properties</i>		
SEVERITY	-1	<i>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</i>	Slightly Detrimental	Likely
IMPACT ON IRREPLACEABLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-14	Very low - negative		
CONFIDENCE LEVEL				
<i>High</i>				

INDUSTRIALISATION OF VIEWS FROM THE PETROPORT, EAST BOUND LAND OF N2	
PROJECT PHASE	<i>Construction, Operational & Decommissioning Phases. Impacts will increase to peak level on completion of construction, be relatively constant during operation and decrease again from peak levels during decommissioning.</i>

DIRECT IMPACT	Change of character due to industrialisation of a Rural Landscape			
INDIRECT IMPACT				
CUMULATIVE IMPACT	Extension of landscape industrialisation			
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 IRREPLACEABLE RESOURCES	0	No irreplaceable resources will be impacted.		
SIGNIFICANCE	-14	Very low - negative		
PROPOSED MITIGATION MEASURES				
Development of the intervening land between the proposed development and the N2				
Screening of the eastern edge of the development.				
The use of colours that blend with the natural landscape should be maximized.				
The use of bright colours that contrast with the natural landscape should be minimized.				
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			
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	Definite

IMPACT ON IRREPLACEABLE RESOURCES	0	<i>No irreplaceable resources will be impacted.</i>		
SIGNIFICANCE	-14	Very low - negative		
CONFIDENCE LEVEL				
<i>High</i>				

1. TERMS OF REFERENCE

- Specialist reports must comply with Appendix 6 of the EIA Regulations, 2014 (as amended).
- Note that where an assessment protocol is prescribed for one of the environmental themes included in the Protocol, the specialist assessment must comply with the Protocol.

2. ASSESSMENT CONVENTIONS

The EIA Team has adopted a set of conventions for purposes of the integrated assessment of potential impacts, and the determination of impact significance. The following list of conventions must be used by specialists when undertaking their discipline-specific assessments.

The EIA Team has adopted a set of conventions for purposes of the integrated assessment of potential impacts, and the determination of impact significance. The following list of conventions must be used by specialists when undertaking their discipline-specific assessments.

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place as the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- **Indirect impacts** of an activity are indirect or induced changes that may occur because of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.
- **Cumulative impacts** are those that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over time and can include both direct and indirect impacts.
- **Nature** – the evaluation of the nature is impact specific. Most negative impacts will remain negative, however, after mitigation, significance should reduce:
 - Positive.
 - Negative.
- **Spatial extent** – the size of the area that will be affected by the impact:
 - Site specific.
 - Local (limited to the immediate areas around the site; < 2 km from site).
 - Regional (would include a major portion of an area; within 30 km of site).
 - National or International.
- **Duration** – the timeframe during which the impact will be experienced:
 - Short-term (0-3 years or confined to the period of construction).
 - Medium-term (3-10 years).
 - Long-term (the impact will only cease after the operational life of the activity).
 - Permanent (beyond the anticipated lifetime of the project).

- ❑ **Intensity** – this provides an order of magnitude of whether the intensity (magnitude/size/frequency) of the impact would be negligible, low, medium, or high):
 - **Negligible** (inconsequential or no impact).
 - **Low** (small alteration of natural systems, patterns, or processes).
 - **Medium** (noticeable alteration of natural systems, patterns, or processes).
 - **High** (severe alteration of natural systems, patterns, or processes).
- ❑ **Frequency** – this provides a description of any repetitive, continuous, or time-linked characteristics of the impact:
 - **Once Off** (occurring as single events any time during construction).
 - **Intermittent** (occurring from time to time, without specific periodicity).
 - **Periodic** (occurring at more or less regular intervals).
 - **Continuous** (without interruption).
- ❑ **Probability** – the likelihood of the impact occurring:
 - **Improbable** (very low likelihood that the impact will occur).
 - **Probable** (distinct possibility that the impact will occur).
 - **Highly probable** (most likely that the impact will occur).
 - **Definite** (the impact will occur).
- ❑ **Irreplaceability** – of resource loss caused by impacts:
 - **High irreplaceability** of resources (the project will destroy unique resources that cannot be replaced).
 - **Moderate irreplaceability** of resources (the project will destroy resources, which can be replaced with effort).
 - **Low irreplaceability** of resources (the project will destroy resources, which are easily replaceable).
- ❑ **Reversibility** – this describes the ability of the impacted environment to return/be returned to its pre-impacted state (in the same or different location):
 - Impacts are **non-reversible** (impact is permanent).
 - **Low reversibility**.
 - **Moderate reversibility** of impacts.
 - **High reversibility** of impacts (impact is highly reversible at end of project life).
- ❑ **Significance** – the significance of the impact on components of the affected environment (and, where relevant, with respect to potential legal infringement) is described as:
 - **Low** (the impact will not have a significant influence on the environment and, thus, will not be required to be significantly accommodated in the project design).
 - **Medium** (the impact will have an adverse effect or influence on the environment, which will require modification of the project design, the implementation of mitigation measures or both).
 - **High** (the impact will have a serious effect on the environment to the extent that, regardless of mitigation measures, it could block the project from proceeding).
- ❑ **Confidence** – the degree of confidence in predictions based on available information and specialist knowledge:
 - **Low.**
 - **Medium.**
 - **High.**

