PROPOSED HARTENBOS WWTW PV SOLAR PLANT
ON REMAINDER OF PORTION 101 OF THE
FARM HARTENBOSCH 217,
MOSSEL BAY

Visual Impact Assessment

Draft Report ver.1.1

114 December 2023

Prepared for:
Sharples Environmental Services cc (SES)
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Executive Summary

A PV Solar Plant is proposed for Hartenbos WWTW.

Megan Anderson was appointed to undertake a Visual Impact Assessment for SES Environmental Consultants.

Two alternative PV Solar Layouts have been proposed, Alternative 1 (Option A) using the full site and Alternative 2 (Option B) using only half the site. Both Alternatives will have access roads from the WWTW area to the south, will be fenced with a visually permeable fence, will have an O&M Building, Relay Room and Inverter substations. The power lines will be buried underground and will feed into a sub station in the WWTW.

The **Scenic Resources** of the site and surrounding area can be described as light industrial, urban, natural and rural with mountain, riverine and coastal views. These visual resources are **Moderately (site) to Highly (surrounds) rated**.

The site is approximately 500m from the R102, 1 km from the N2 and 1km to the nearest residential area of Monte Christo, some of the highly sensitive receptors..

The **Viewshed** of the site is restricted by the surrounding hills and ridgelines with the **Zone of Visual Influence** (ZVI) being **local** and limited to an area within a radius of 5kms.

The **Receptors** are rated as **highly, moderately and minimally sensitive.**

The inherent **visual sensitivity of the site is Moderate to Low**.

The **Visual Absorption Capacity** of the site is **moderate,** there is partial screening by topography and vegetation

The V**isual Intrusion** will be **low to moderate,** partially fitting into the surroundings yet being clearly noticeable**.**

The potential visual impacts will be:
- **Visual scarring during Construction** (vegetation clearing and earthworks);
- **Visibility** from Sensitive Receptors (Hartlands, Monte Christo and access Road, Hartenbos Suburbs, N2 and R102

	Alternative A (Option 1 Full Site)		**Alternative B (Option 2 Half Site)**		**No-Go Alternative**	
	Significance before mitigation	Significance after mitigation	Significance before mitigation	Significance after mitigation	Significance before mitigation	Significance after mitigation
a. Construction Phase - Visibility scarring during construction						
	Medium(-)	Medium - Low (-)	Medium - Low (-)	Low (-)	Neutral	Neutral
b. Operations Phase - Visibility from Sensitive Receptors						
	Medium - High (-)	Medium (-)	Medium - Low (-)	Low (-)	Neutral	Neutral

The potential impacts of the proposed Alternative A (Option 1 Full Site) development will have a Medium - High significance (negative) before mitigation and Medium - Low significance (negative) after mitigation.

The potential impacts of the proposed Alternative B (Option 2 Half Site) development will have a Medium - Low significance (negative) before mitigation and Low significance (negative) after mitigation.

The mitigation of the impacts will entail:
- Limiting disturbance during construction,
- Stockpiling topsoil for rehabilitation,
- Using earthworks soil for constructing screening berms on the eastern, northern and western boundaries, planting shrubs and ground covers on the berms, with trees along the Monte Christo Road, to help screening.

The planting of berms and trees could have a shadow affect so the arrangement of the PV solar panels would need to be accordingly adjusted.

We are of the opinion that if the mitigation measures are enforced, that the proposed Alternative 1 (Option A) will have a MEDIUM - LOW VISUAL IMPACT and Alternative 2 (Option B) will have a LOW VISUAL IMPACT.

Visual Glint and Glare study has not been included in this study.

1. Name, Expertise and Declaration

1.1 Name

Megan Anderson, of Megan Anderson Landscape Architects, is a self-employed Landscape Architect who has been consulting in the Western Cape since 1991, to clients from the public and private sector.

1.2 Expertise

Megan Anderson's projects range from:

- visual impact assessments (VIAs) of proposed developments for EIA and HIA processes;
- environmental and landscape policy and planning;
- upgrading and rehabilitation of natural systems;
- planning and implementation in heritage and cultural precincts; and
- planning, design and landscape development in residential and urban areas and community projects.

PRINCIPAL AGENT: Megan Anderson Registered Professional Landscape Architect (PrLArch) BLArch (UP) 1983 MILASA

REGISTRATION OF PRINCIPLE AGENT

1994 South African Council for Landscape Architect Professionals (94063)
1992 Institute of Landscape Architects of South Africa (P217)

QUALIFICATIONS

1983 University of Pretoria Bachelor of Landscape Architecture

VISUAL IMPACT ASSESSMENT EXPERTISE

Megan Anderson has been doing Visual Impact Assessments (VIA's) since 1989 when working for OvP and BOLA. Since then, she has completed more than 100 VIA's for a variety of developments including mining, harbours, wind and solar farms, communication towers, commercial and residential developments.

1.3 Declaration of independence

I, Megan Anderson declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed Hartenbos WWTW Solar Plant in the Western Cape, application or appeal in respect of which I was appointed, other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.

MEGAN ANDERSON
Megan Anderson Landscape Architects
Professional registration number: SACLAP - 94063

2. Introduction

2.1 Background to this report

SES has been appointed as the Independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Impact Assessment process for the proposed Proposed Hartenbos

WWTW PV Solar Plant on the remainder of Portion 101 of the Farm Hartenbosch 217, Mossel Bay.

Megan Anderson Landscape Architects have been appointed to undertake a Visual Impact Assessment Report for the proposed Project.

2.2 Terms of reference

The PGWC's DEA&DP's "Guidelines for involving visual and aesthetic specialists in the EIA process" will be referred to as required content of study and report.

This document provides 'triggers' (i.e. characteristics of either the receiving environment or the proposed project), which indicate that visibility and aesthetics are likely to be 'key issues' and may require specialist input.

The following characteristics of the site and project are probable triggers which suggest potential visual issues:

The nature of the receiving environment:

- Areas with proclaimed heritage sites or scenic routes;
- Areas with intact or outstanding rural or townscape qualities;
- Areas with a recognised special character or sense of place;
- Areas of important tourism or recreation value;
- Areas with important vistas or scenic corridors;

The nature of the project (type and scale):

- A change in land use from the prevailing use;
- A significant change to the fabric and character of the area;
- Possible visual intrusion in the landscape;

The guideline document goes on to correlate two aspects, environment types and development types, 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.

We believe the "Type of environment" is "Areas or routes of high scenic, cultural or historic significance" and the "Type of Development" is a Category 3 development as defined below:

Category 4 development:
e.g. ….. light industry, medium-scale infrastructure. The expected visual impact is moderate to high, namely:

Table 1: Categorisation of issues to be addressed by the visual assessment

Type of environment	Type of development (see Box 3) Low to high intensity				
	Category 1 development	Category 2 development	Category 3 development	Category 4 development	Category 5 development
Protected/wild areas of international, national, or regional significance	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected	Very high visual impact expected
Areas or routes of high scenic, cultural, historical significance	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected	Very high visual impact expected
Areas or routes of medium scenic, cultural or historical significance	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected	High visual impact expected
Areas or routes of low scenic, cultural, historical significance / disturbed	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected	High visual impact expected
Disturbed or degraded sites / run-down urban areas / wasteland	Little or no visual impact expected. Possible benefits	Little or no visual impact expected. Possible benefits	Little or no visual impact expected	Minimal visual impact expected	Moderate visual impact expected

High visual impact expected:

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

Explanation of terms used:

Noticeable change – clearly visible within the view frame and experience of the receptor

The suggested level of visual impact assessment for expected high visual impacts will be a level 4 to 4 study.

2.3 Methodology

The Visual Study aims to identify the visual impact on the landscape.

The methodology was to:

- undertake a site inspection (22 November 2023);
- undertake a photographic survey, (using an I-phone 13) of the site from within the Viewshed and from Receptors;
- review relevant literature;
- describe, quantify and assess the scenic and visual resources of the area and site;
- establish the view catchment and zone of visual influence of the site;
- establish receptors;
- establish the visual sensitivity of site resulting from topography, slope grades, landforms, vegetation, special features and land use; and
- Identify and assess the potential visual impacts.

2.4 Limitations and assumptions

This study does not include a Glint and Glare study.
The development information provided is at Concept Stage. Reference is made to mass earthworks (cut - fill). This has yet to be designed. The site cross sections will change, with the slope becoming flatter. This may influence the significance of the visual impacts.

3. Proposed Development

3.1 Location

The proposed site of the Hartenbos WWTW PV Solar Plant is on the remainder of Portion 101 of the Farm Hartenbosch 217, Mossel Bay. This is in the Mossel Bay Municipality of the Western Cape. The site is located north of the R102 and the N2.

Figure 1: Location of the site north of the N2 (Source SES)

Figure 2: Location of the WWTW site immediately north of the R102 (Source: Element Consulting Engineers)

Figure 3: Location of the proposed PV Solar Plant site in the Hatenbos WWTW site (Source: Element Consulting Engineers)

3.2 Description of the Development

The Hartenbos Waste Water Treatment Works has been identified as a facility where a PV Solar Plant with sufficient battery energy storage capacity could be implemented.

The proposed system will be a hybrid system that will be grid-tied under normal operating conditions, while providing battery backup as first line of support when the grid supply is interrupted. Standby diesel generators will also be incorporated into the system design to serve as a final level of support to the load when the batteries are depleted, and the grid supply (or PV solar generation) remains unavailable.

In summary, it can be concluded that the proposed hybrid system will consist of the following:

- 1760 kVA grid-tied, free-field solar PV installation (requiring ± 20 000m^2 installation area).
- Installation of 3692 x 550Wp Mono-crystalline Solar Panels, which convert the solar radiation into direct current.
- Fixed tilt ground mounting structures, which supports the PV modules.
- 5x String inverters, which convert the DC from the solar field to AC.
- 1x MV Inverter Station (3.2MVA), which collects the AC output from each of the inverters and incorporates a step-up power transformer, which steps the inverter output voltage up to the 11kV network voltage. The inverter station also has integrated 11kV switchgear to connect to the MV network.
- 4512 kWh Battery Energy Storage System (consisting of 2x 2256kWh batteries in containers).
- 1x 1.757 MVA Power Conversion System (PCS), which converts the DC battery output to AC power.
- 1x 1.6 MVA Isolation transformer, which steps the PCS output up to 11kV.
- 2x 800 kVA Backup Diesel Generators (containerised).
- 1x 1.6 MVA Step-up transformer, which steps the generator output up to 11kV.
- 6x 11kV (25kA) AIS switchgear panels, complete with associated protection, metering and control elements, to be housed in a new substation building.

- 1x 11kV Neutral Earthing Resistor (NER), to be installed on the star-point of the generator step-up transformer's MV winding.

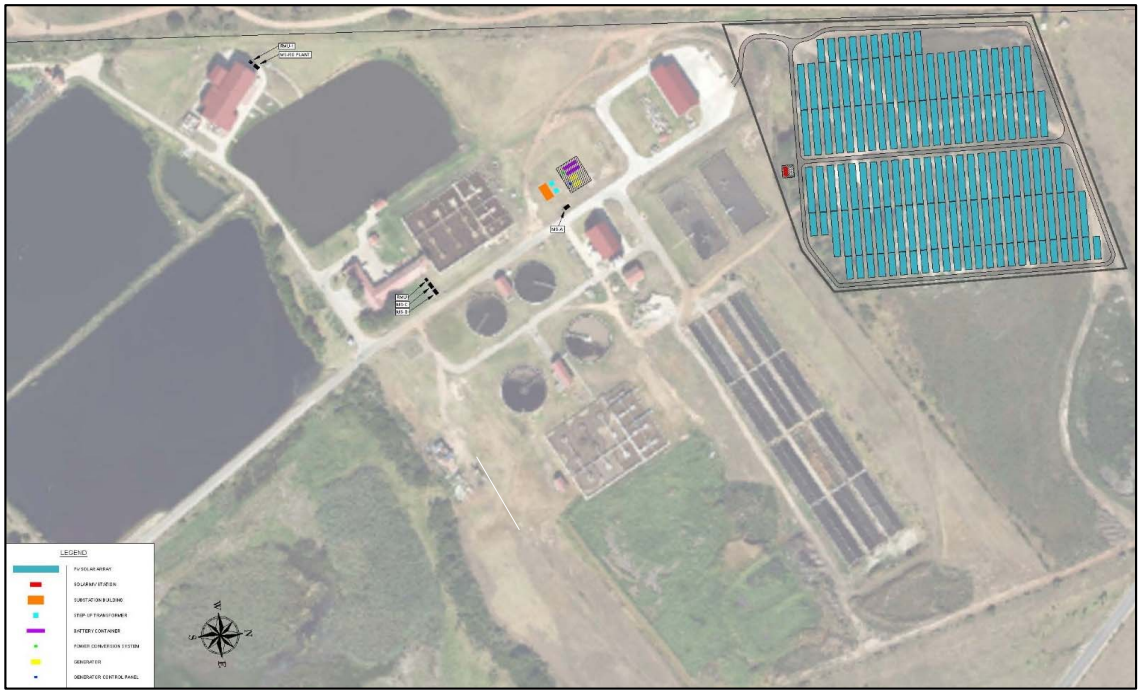


Figure 4: The proposed Preliminary Site Development Plan showing the positions of various associated equipment on the site (Source: Element Consulting Engineers)

There are two proposed Layout Options indicated on the plans below.

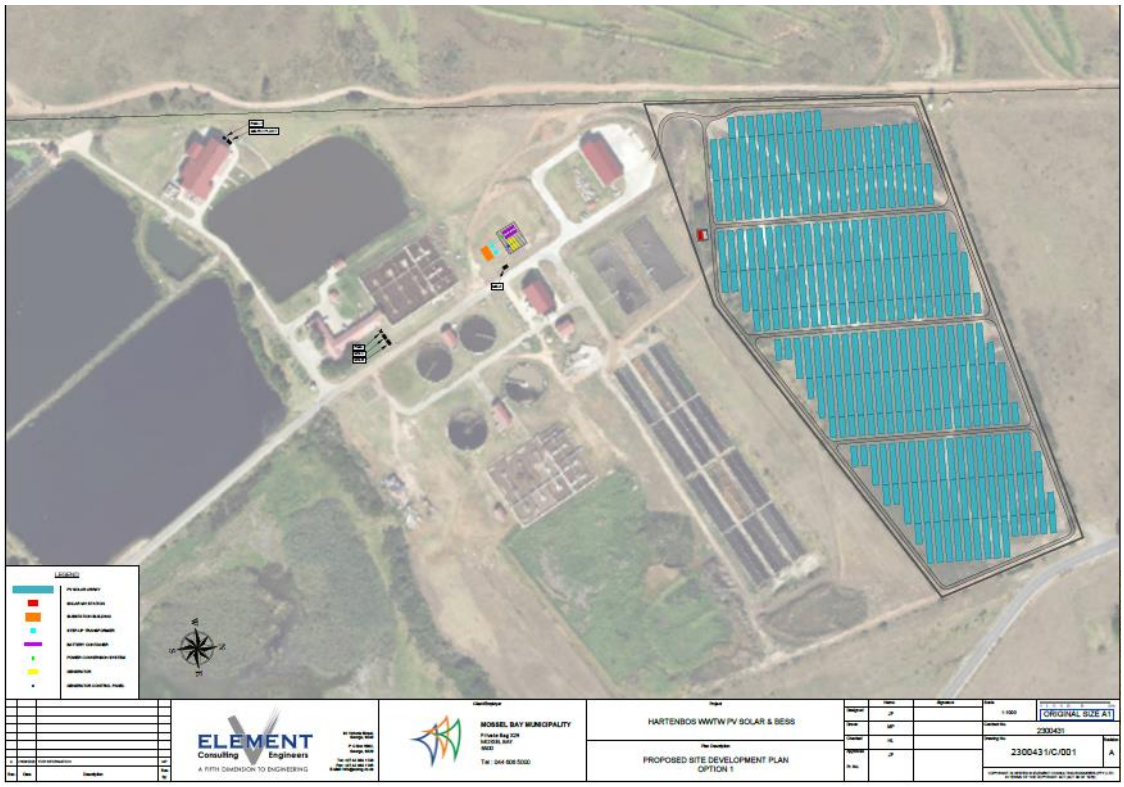


Figure 5: Proposed Site Development Plan - Layout Option 1 (Source: SES)

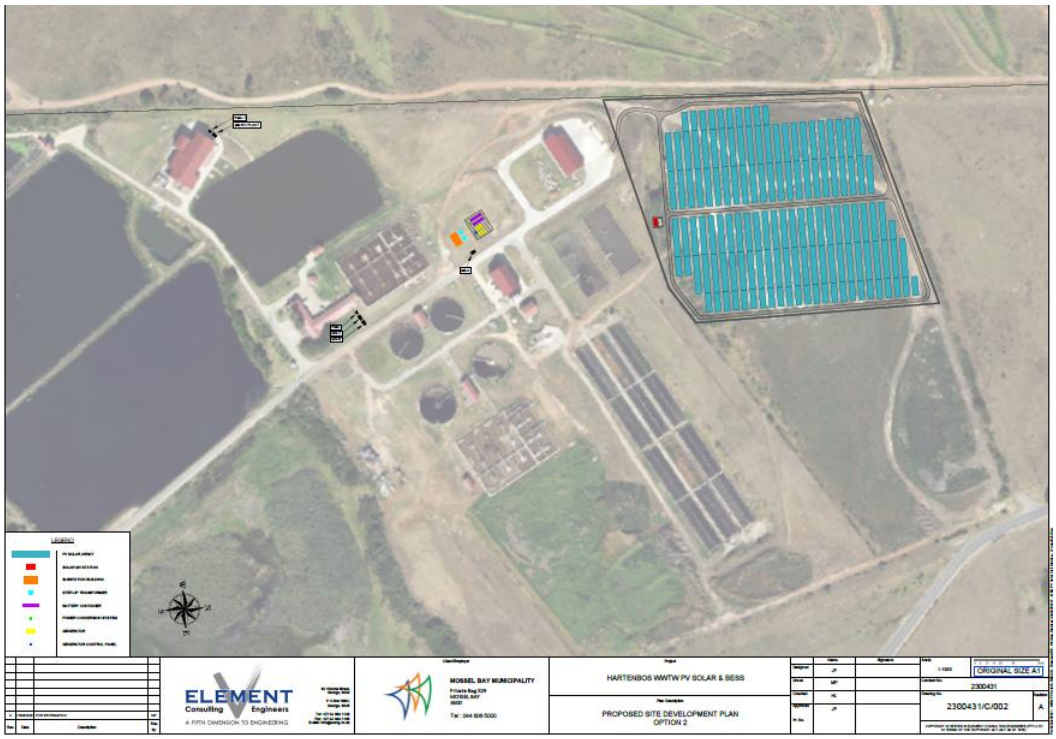


Figure 6: Proposed Site Development Plan - Layout Option 2 (Source: SES)

The aspects of the Solar Farm that will be visible are the:

- PV solar modules mounted on fixed structures,
- Inverters which will be installed under a canopy
- Inverter Power stations which will be containerised
- Proposed Battery Energy Storage System (BESS) housed in containers
- MV switchgear panels will be installed in a dedicated, brick-built substation building
- Containerised backup diesel generator units
- Weather station

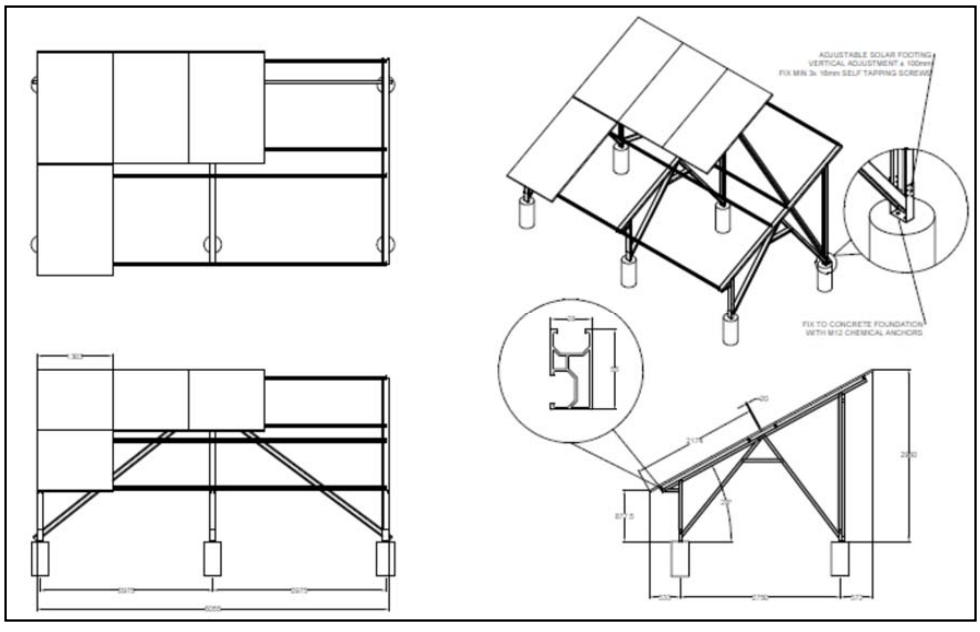


Figure 7: Typical PV Mounting structure (Source: Element Consulting Engineers)

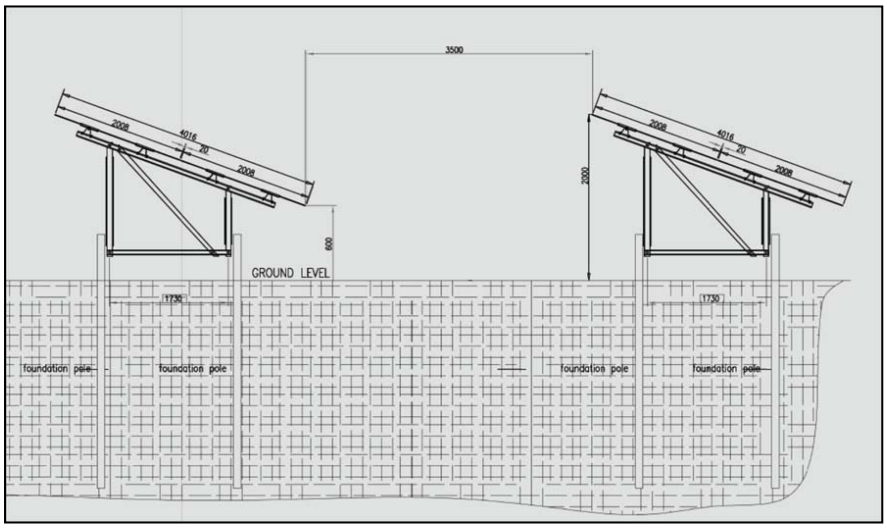


Figure 8: Typical PV Array Structure (Source: Element Consulting Engineers)

Figure 9: Typical Fixed-tilt Ground-mount System (Source: Element Consulting Engineers)

Figures 10 and 11: Typical Inverter Canopy (Credit Eversolar) and Containerised Inverter Power Stations (Source: Element Consulting Engineers)

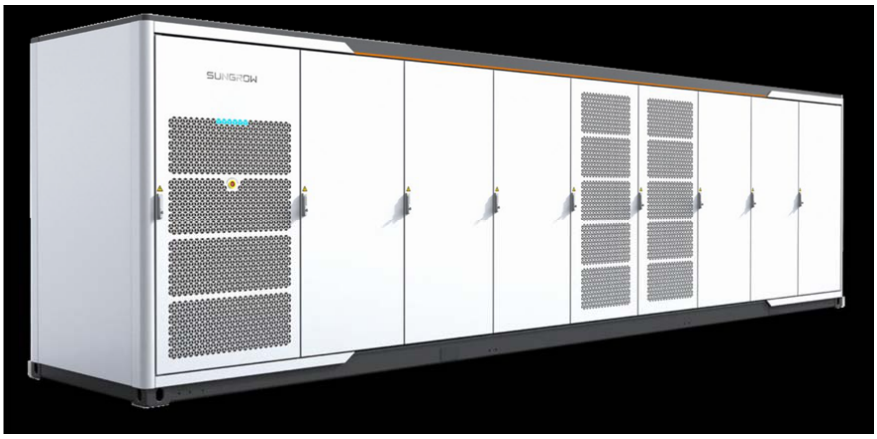


Figure 12: Typical Containerised Battery Energy Storage System

Figure 13: Typical Brick Built substation to house the MV switchgear.

Figure 14: Typical Diesel Generator Set In container and Typical Weather Station

The site will be cleared of vegetation, debris, and obstacles. Mass earthworks (cut and fill) will be required on the site to obtain a uniform and workable platform for the installation.

Access to the site will be via the Hartenbos Regional wastewater treatment works (WWTW), which in turn obtains access from the R102 (MR344) via a security controlled access gate. Access to the PV Solar site will be on the north-western corner of the Hartenbos WWTW.

An internal access and perimeter road network will be provided. This will be paved up the solar MV station. The remainder of the perimeter and internal roads will be gravel.

All disturbed areas shall be rehabilitated and maintained.

A high security fence (Clearvu or similar) shall be provided for the full perimeter.

3.3 Mossel Bay Spatial Development Framework and Environmental Management Framework, 2022

The proposed site of development falls within the Urban Edge and development footprint.

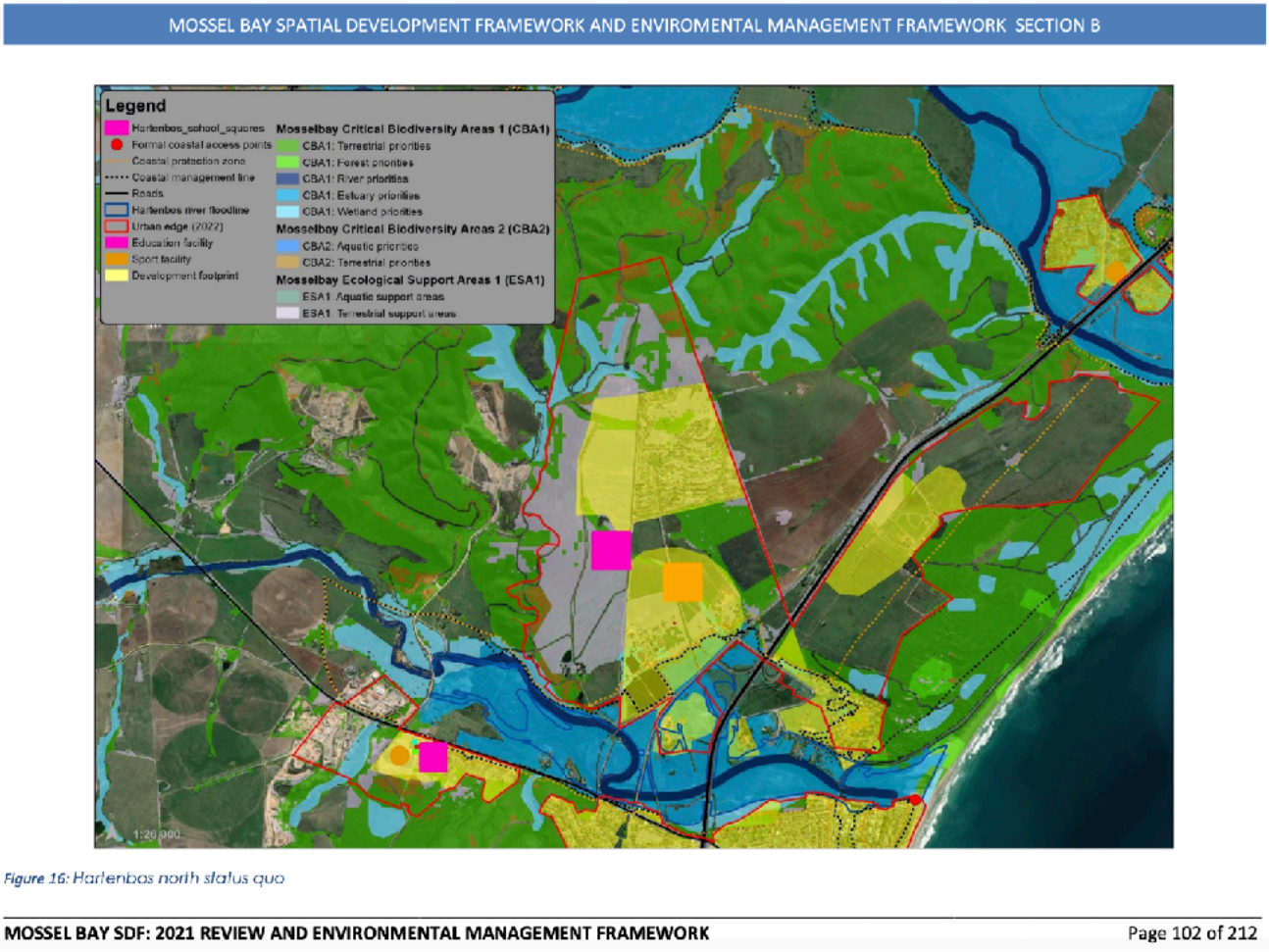


Figure 15 Mossel Bay SDF 2022

4. Visual Framework Study

The following criteria (4.1 - 4.6) relate specifically to visual impact assessments. Proposed projects are assessed against these criteria

4.1 Scenic Resources

The proposed PV Plant site is in the lower Hartenbos Valley, in the Mossel Bay Municipality which is within the the Eden Region of the Western Cape.

Oberholzer and Winter describe the Eden Region in which the site is situated, as follows:

2.7 Eden

The Cape Fold Mountains, predominantly the Langeberg and Outeniqua ranges, continue east from the Overberg as far as Plettenberg Bay (and even further to Port Elizabeth). Between the mountains and the coast, the well known „Garden Route" traverses a series of estuaries, lakes and forests of scenic value between Mossel Bay and Plettenberg Bay. The northern boundary of the Eden District is defined by the impressive Swartberg Mountains, a range consisting of the same Table Mountain Group sandstones, reaching over 2100m in places, and often covered by snow in winter.

The Little karoo is generally of geological and palaeontological significance, while the coast in particular has a number of important archaeological sites, such as at Pinnacle Point (Provincial Heritage Site), Robberg Peninsula, Blombos Cave and Matjies River Cave (Keurboomstrand).

Agricultural towns were established at Heidelberg, Riversdale, Calitzdorp, Ladismith, Uniondale and Oudtshoorn in the 1800s, usually based on a grid pattern, and often with allotment gardens. The late 1900s saw the rapid growth of a number of coastal towns, such as Still Bay, Mossel Bay, Wilderness, Sedgefield, Knysna and Plettenberg Bay.

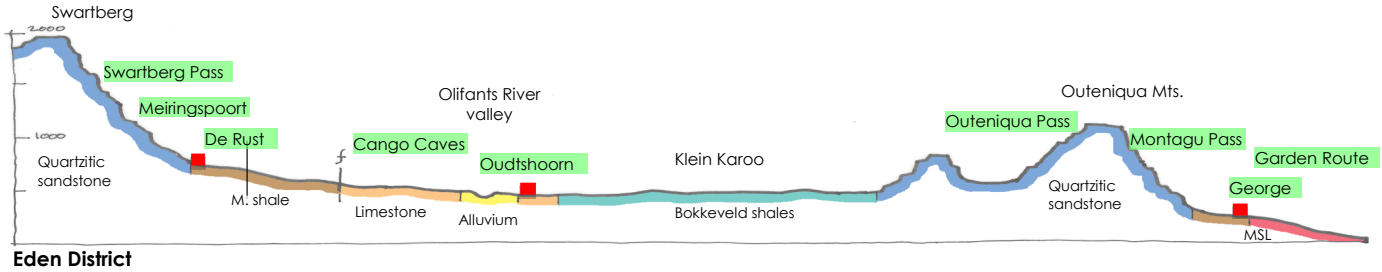


Figure 16 : Section through the Eden Region illustrating the pronounced topography of quartzitic sandstone (blue) as well as the location of settlements on the footslopes with access to water and productive soils of the granites, shales and alluvial valleys.

The landscape types which characterise the site and surrounds of the proposed Hartenbos WWTW development include:

- a coastal edge, beaches and dunes of Quartenary sand,
- the lower reaches of Hartenbos river valley and estuary, with resorts along the banks,
- rolling hills, cultivated for agriculture and with residential development, municipal facilities and tourist/commercial areas,
- the sandstone ridge to the south east covered in residential development.

The area is mixed use with natural elements (rivers and dunes in the north east) entwined with residential development and cultivated rural fields.

Figure 17: View from south of the Hartenbos Valley looking north towards the PV solar site with the Outeniqua mountains in the distance. Agricultural and residential development on the hills above the WWTW. Hartenbos river flanked by natural vegetation, crossed by the Rail, R102 and N2 road bridges and overhead services

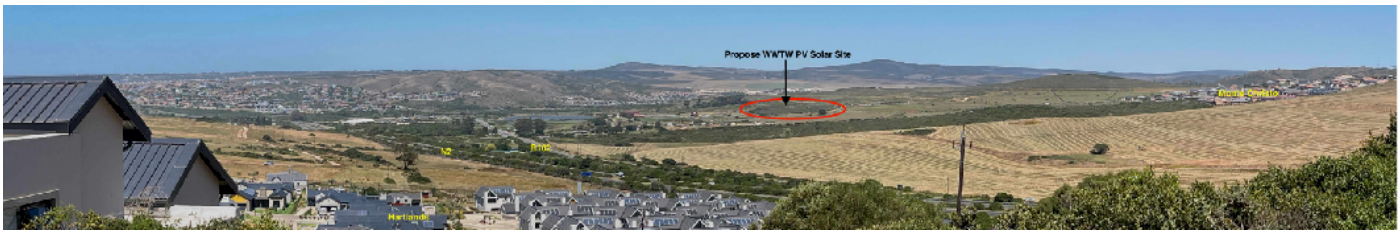


Figure 18: View from north of the Hartenbos Valley looking south west towards the PV solar site. Agricultural and residential development on the surrounding hills the WWTW. The R102 and N2 traversing the valley

The PV Solar site itself is adjacent to, and north of, the WWTW which is located at the toe of the hills, adjacent to the river plain, above the flood line. The surrounding area is rural and industrial in nature with a green waste chipping depot to the north west of the site.

The Scenic resources of the site and area can be described as light industrial, urban, natural and rural with mountain, riverine and coastal views. These visual resources are Moderately to Highly rated.

4.2 Viewshed and Zone of Visual Influence(ZVI) - Visibility of the Project

Visibility of the project – the geographic area from which the project will be visible, or view catchment area. (The actual zone of visual influence of the project may be smaller because of screening by existing trees and buildings). This also relates to the number of receptors affected.

- *High visibility* – visible from a large area (e.g. several square kilometres).
- *Moderate visibility* – visible from an intermediate area (e.g. several hectares).
- *Low visibility* – visible from a small area around the project site.

4.2.1 Viewshed

The geographical area from which the project will theoretically be visible, or view catchment area, is dictated primarily by topography.

The WWTW PV Solar Plant site (red polygon on figure below), is on a south east facing gently sloping foothill slope close to the edge of the river plain in Hartenbos. The red shaded area is the Viewshed of the proposed PV Solar Plant and is defined by the surrounding hills, ridges and dunes.

Figure 19: Viewshed of the proposed Hartenbos PV Solar Plant site of development

4.2.2 Zone of Visual Influence

Local features such as landforms and vegetation will reduce the extent of the area from which the site and proposed development will be seen, to an area known as the Zone of Visual Influence (ZVI) of the site. Furthermore the visibility of solar panels in the landscape is limited to 5kms.

The ZVI for the PV Solar site and development includes the areas highlighted green on the Google figure below. Most of the areas that will see the development are within 2,5kms of the site with a very few areas between 2,5 and 5kms.

Figure 20: ZVI of the proposed Hartenbos WWTW PV Solar development

4.3 Receptors

Visual sensitivity of Receptors – The level of visual impact considered acceptable is dependent on the type of receptors.

- *High sensitivity* – e.g. residential areas, nature reserves and scenic routes or trails;
- *Moderate sensitivity* – e.g. sporting or recreational areas, or places of work;
- *Low sensitivity* – e.g. industrial, mining or degraded areas.

4.3.1 Highly sensitive receptors include:

- Residential areas on higher lying areas including Monte Christo to the north west, Hartlands to the north east, Hartenbos Suburbs to the south and south east
- The N2 and R102 are routes travelled by local, national and international tourists who visit the Garden Route
- Hartenbos River precinct and resorts along the river
- Nature Reserves

4.3.2 Moderately sensitive receptors include:

- Adjacent work areas on farms
- Commercial areas

4.3.3 Low sensitivity receptors include:

- WWTW and Green recycling area
- Construction company yard

*The receptors within the ZVI are inclusive of those rated as **low** to **highly** sensitive.*

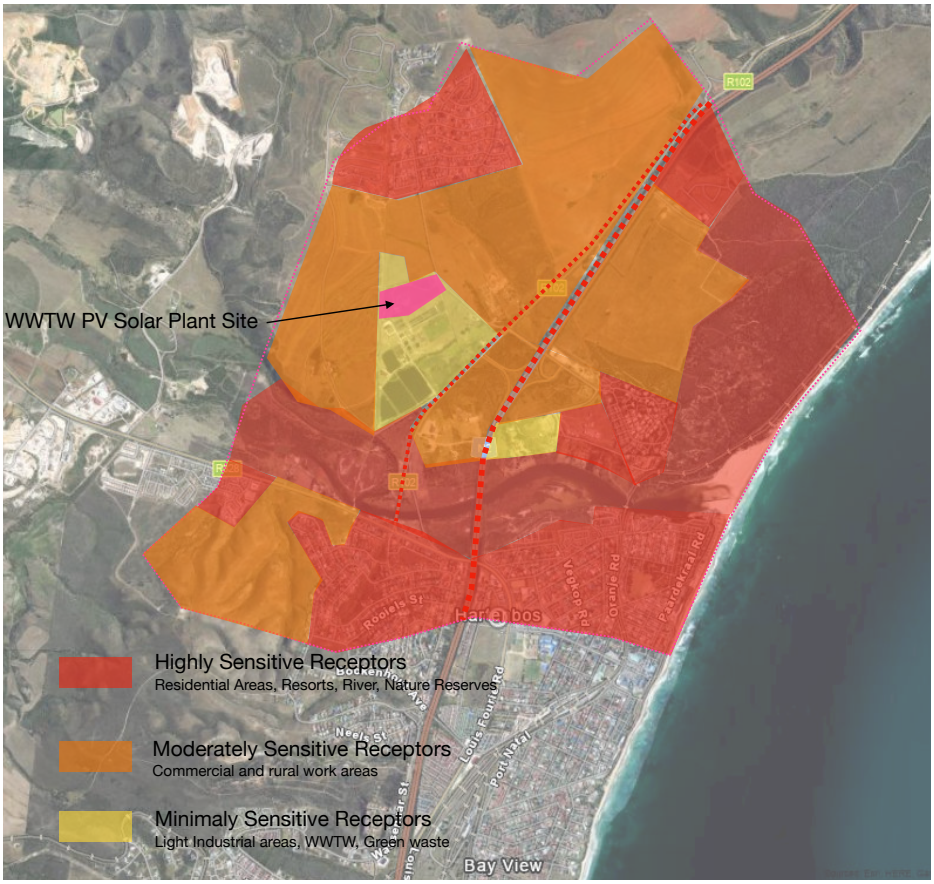


Figure 21: Highly sensitive Receptors of the WWTW PV Solar Site

4.4 Visual Sensitivity of the site

Visual sensitivity of the area – the inherent visibility of the landscape, usually determined by a combination of topography, landform, vegetation cover and settlement pattern. This translates into visual sensitivity.

- *High visual sensitivity* – highly visible and potentially sensitive areas in the landscape.
- *Moderate visual sensitivity* – moderately visible areas in the landscape.
- *Low visual sensitivity* – minimally visible areas in the landscape.

The following aspects of the site contributing to the inherent visual sensitivity are:

- ***Topography*** – relative elevations can either provide subtle visual absorption capacity in the case of lower lying areas, which will be less visually sensitive or visual exposure in the case of higher lying land which will be highly visually sensitive.

  In the case of the Hartenbos WWTW PV Solar site, the site is situated on the lower lying foothills, just above the valley floor and will be moderately sensitive and will have a **moderate visual sensitivity**.

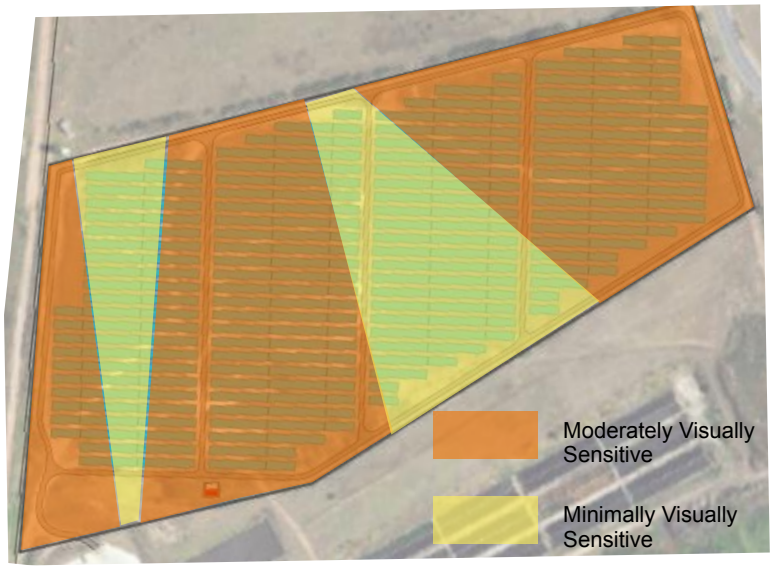
- ***Landforms*** - The landforms identified on the site are:
  - hillslopes with some convex slopes which will have a **moderate visual sensitivity**.

- ***Slopes*** - the slope gradients affect the visual sensitivity of a site as development on steep slopes is likely to result in earthworks such as cut to fill/terracing resulting in visual scaring. The flatter the slope the less sensitive it becomes. Based on Cape Farm Mapper's 5 m contour intervals on the site the slopes flatter than 1:15 and are thus moderately to minimally visible in the landscape and will have a **moderate to low visual sensitivity.**

- ***Adjacent landuses*** - provide levels of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape. Adjacent landuses include:
  - The WWTW and green recycling area - this is **minimaly visually sensitive**
  - Farming including annual crops - this is **moderately visually sensitive**
  - Residential Estates access road - **moderately to highly visually sensitive**

- **V*egetation*** - this includes low scrub with some hedgerows on the boundaries - these provide minimal to moderate screening.**The visual sensitivity varies from Low (hedgerows) to Moderate (low scrub).**

The combined natural and built aspects of the site and surrounds - topography, landform, landuse and vegetation - render the site to have a moderate to low visual sensitivity.



Proposed 'Option A' PV Solar layout with site sensitivity

Proposed 'Option B' PV Solar layout with site sensitivity overlay

Figure 22: Site sensitivity overlaid on the proposed options

4.5 Visual Absorption Capacity

Visual absorption capacity (VAC) - the potential of the landscape to conceal the proposed project, i.e.

- *High VAC* – e.g. effective screening by topography and vegetation;
- *Moderate VAC* - e.g. partial screening by topography and vegetation;
- *Low VAC* - e.g. little screening by topography or vegetation.

The proposed site of development is on lower gently sloping foothills which provide partial screening. Some large Eucalyptus trees to the south east provide screening from areas on lower lying elevations.
The **VAC** of the site is **moderate,** there is partial screening by topography and vegetation

4.6 Visual Intrusion

Visual intrusion – the level of compatibility or congruence of the project with the particular qualities of the area, or its 'sense of place'. This is related to the idea of context and maintaining the integrity of the landscape or townscape.

- *High visual intrusion* – results in a noticeable change or is discordant with the surroundings;
- *Moderate visual intrusion* – partially fits into the surroundings, but clearly noticeable;
- *Low visual intrusion* – minimal change or blends in well with the surroundings.

Although the WWTW are surrounded by rural lands, restaurants, resorts and residential areas the proposed site is tucked in between the WWTW (south) and the green material recycling area (north).

The proposed development will partially fit into the surroundings although it will be clearly noticeable from a few areas. The **visual intrusion** of the WWTW PV Solar development is therefore **low to moderate.**

5. POTENTIAL VISUAL IMPACTS OF THE PROPOSED DEVELOPMENT

The methodology to determine the significance ratings of the potential environmental impacts and risks associated with the alternatives is as prescribed by SES.
The assessment criteria utilised in the Basic Assessment Report is based on, and adapted from, the Guideline on Impact Significance, Integrated Environmental Management Information Series 5 (Department of Environmental Affairs and Tourism (DEAT), 2002) and the Guideline 5: Assessment of Alternatives and Impacts in Support of the Environmental Impact Assessment Regulations (DEAT, 2006). See Appendix !

The nature of the visual impacts will be the visual effect the activity would have on the receiving environment, namely the visual effects the PV Solar Power Plant has on the rural, residential, industrial and urban landscape.

The development could have the following potentially negative visual impact:
Construction Phase - Visual scaring as a result of vegetation clearance and earthworks
Operation Phase - Visibility of the PV Solar Power Plant from the residential areas of Monte Christo, Hartlands and Hartenbos Suburbs and on the R102, N2 and Monte Christo access road

5.1 Construction Phase - Visual scaring as a result of vegetation clearance and earthworks

During the construction phase of development, the vegetation will be cleared from the site and earthworks will result in visual scarring - subsoil being visible.

	Alternative A (Option 1 Full Site)	**Alternative B (Option 2 Half Site)**	**No-Go Alternative**
PHASE: CONSTRUCTION			
Nature of impact:	**Visual scarring as a result of clearing vegetation and earth-works**		Stays as is
Extent: of Impact	Local – limited to the site and surrounding municipal area		N/A
Duration of impact	Temporary		N/A
Probability of occurrence:	Definite		N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium	Medium - low	N/A
Degree to which the impact may cause irreplaceable loss of resources	Marginal		N/A
Degree to which the impact can be reversed:	Partly		N/A
Degree to which the impact can be mitigated:	Can be mitigated		N/A
Proposed mitigation:	Minimise disturbance, create berms for screening on east, north and west boundaries, stockpile weedless topsoil for revegetation, revegetate berms with ground covers and hedges/shrubs/trees and PV areas with low growing indigenous lawn grass		N/A
Significance rating of impact after mitigation	Medium - low	Low	N/A
Cumulative impact	Low	Low	N/A
Consequence Significance	Insignificant	Negligible	N/A

5.2 Operation Phase - Visibility from the Residential areas to the north and south and from the tourist Routes/access roads.

The development will take place on an undeveloped, but not pristine, erf adjacent to the WWTW in the south, green recycling/chipping yard in the north west, access road to Monte Christo in the west and rural landscape west and east.

The site is gently sloping with a south easterly aspect, resulting in the site being more visible to the south, than to the north although it is clearly visible from the north east. It is understood that the site will be graded, cut to fill, which will potentially reduce the visibility from the south but potentially increase it from the north.

Figure 23: View of proposed PV Solar Plant site from Hartenbos suburbs, 1750 meters to the south

Figure 23a: View of proposed Alternative 1 PV Solar Plant from Hartenbos suburbs, 1750 meters to the south

Figure 23b: View of proposed Alternative 1 PV Solar Plant from Hartenbos suburbs, 1750 meters to the south with proposed mitigation measures, I.e. planted berms

Figure 24: View of proposed PV Solar Plant Site Hartlands Estate 2250 meters to the north east

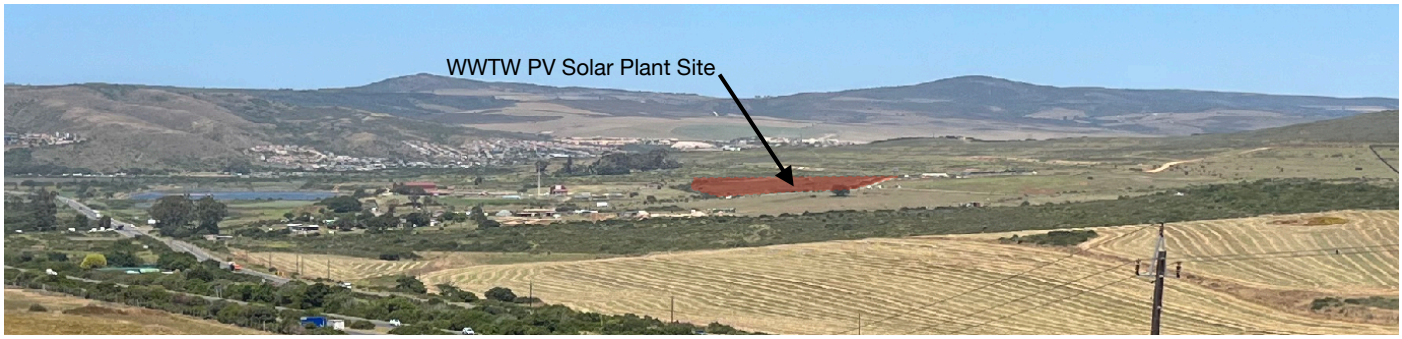


Figure 24a: View of proposed PV Solar Plant Hartlands Estate, 2250 meters to the north east

Figure 24a: View of proposed PV Solar Plant from Hartlands Estate, 2250 meters to the north east showing mitigation measures I.e. planted berms

Figure 25: View of proposed PV Solar Plant site from Monte Christo Estate, 1000 meters to the north

Figure 25a: View of proposed PV Solar Plant from Monte Christo Estate, 1000 meters to the north. Panels will be less visible as site slopes down from north (front) to south (back)

Figure 25b: View of proposed PV Solar Plant from Monte Christo Estate, 1000 meters to the north showing mitigation measures i.e. planted berm.

The proposed footprint of development varies between the two Options as indicated in Figures 5 Option 1 which uses the whole site for PV panels and Figure 6 Option 2 which uses the western half of the site only.

Option 1 will be clearly visible from the Monte Christo Road as the PV panels are immediately adjacent to this road.

The visibility will be greatest from Monte Christo Road due to the proximity with visibility from Hartlands and the Hartenbos Suburbs being clearly noticeable albeit from a distance

	Alternative A (Option 1 Full Site)	**Alternative B (Option 2 Half Site)**	**No-Go Alternative**
PHASE: OPERATION			
Nature of impact:	**Visibility from the Receptors namely Residential areas to the north and south and from the Tourist Routes/access roads.**		Stays as is
Extent: of Impact	Local – limited to the site and surrounding municipal area		N/A
Duration of impact	Medium to Long term		N/A
Probability of occurrence:	Highly Probable		N/A
Significance rating of impact prior to mitigation (e.g. Low, Medium, Medium-High, High, or Very-High)	Medium - High	Medium	N/A
Degree to which the impact may cause irreplaceable loss of resources	Marginal		N/A
Degree to which the impact can be reversed:	Partly		N/A
Degree to which the impact can be mitigated:	Can be mitigated		N/A
Proposed mitigation:	Create berms for screening on east, north and west boundaries, stockpile weedless topsoil for revegetation, revegetate berms with indigenous ground covers and hedges/shrubs/trees and PV areas with low growing indigenous lawn grass, Plant trees along Monte Christo Road		N/A
Significance rating of impact after mitigation	Medium - low	Low	N/A
Cumulative impact	Low	Low	N/A
Consequence Significance	Insignificant	Negligible	N/A

6. Mitigation Measures

The Hartenbos WWTW PV Solar Plant will result in a low to medium visual impact, being visible from residential areas and commuter roads.

Certain mitigation measures will reduce the visual impact of the proposed development on the residents and commuters namely:

- Create an earth/sand berm (long earth mound) on the eastern, northern and western borders of the site, approximately 1 - 1,5m high, within the fenced area of the site and plant this with coastal scrub typical of the surrounding area, that will get to a height of 1 - 1,5 meters. The selection of the plant species should be made in consultation with the botanist.
- Alternatively, a hedge could be planted along the eastern, northern and western boundaries with some larger trees along the eastern boundary that will help screen the PV Solar Plant from the north east - Hartlands Estate, N2 and R102.

- Structures on the site should be painted recessive colours such as charcoal grey and the building materials should also be non - reflective and dark grey colours.

7. Environmental Management Plan (EMP)

The above mentioned mitigation measures should be included in the EMP and should be monitored by the ECO.

8. Conclusion

The Hartenbos WWTW proposed PV Solar Plant is situated within an area that is characteristically light industrial, i.e. the WWTW and the green waste recycling/chipping area. The proposed PV Solar panels are therefore congruent with the immediate surrounds.

The affected residential areas are at least 1km from the site and N2 and R102 tourist routes are at least 500m from the site. The distance mitigates the visibility. The Monte Christo Road which is the Estates access road, passes next to the eastern boundary of the site and users will be the most impacted seeing the structures in close proximity if Alternative 1 (Option A) is developed.

The Hartenbos WWTW proposed PV Solar Plant will result in a medium to low visual impact, being visible from residential areas and commuter and tourist roads in the surrounding municipal areas.

Mitigation measures will reduce the potential impacts and if these mitigation measures are implemented. The significance of the visual impacts will be medium - low for Option A and Low for Option B. The lesser footprint required for Option B allows more space for mitigation measures to be implemented.

The Scenic Resources and Landscape Character of the area will be little impacted as the development site is relatively low lying and within an area of similar development character. The proposed development is generally low, it’s scale is in keeping with other rural and residential blocks.

We are of the opinion that if the mitigation measures are enforced, that the proposed Alternative 1 (Option A) will have a MEDIUM TO LOW VISUAL IMPACT and Alternative 2 (Option B) will have a LOW VISUAL IMPACT.

9. References

Oberholzer, B., 2005. Guidelines for involving visual and aesthetic specialists in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 F. Republic of South Africa, Provincial Department of the Western Cape, Department of Environmental Affairs and Development Planning, Cape Town.

Oberholzer, B. and Winter, S. 2013 (ver 5). Heritage and Scenic Resources, Inventory and Policy Framework for the Western Cape.

Western Cape Government (WCG), 2014. Provincial Spatial Development Framework.

WM de Kock Associates et al. Mossel Bay Spatial Development Framework/Environmental Management Framework Section B - Spatial Development Framework Proposals and Environmental Management Framework, May 2022

Appendix 1: Environmental Impact Assessment Methodology

Determination of Extent (Scale):

Site specific	On site or within 100 m of the site boundary, but not beyond the property boundaries.
Local	The impacted area includes the whole or a measurable portion of the site and property, but could affect the area surrounding the development, including the neighbouring properties and wider municipal area.
Regional	The impact would affect the broader region (e.g., neighbouring towns) beyond the boundaries of the adjacent properties.
National	The impact would affect the whole country (if applicable).

Determination of Duration:

Temporary	The impact will be limited to the construction phase.
Short term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than 8 months after the completion of the construction phase.
Medium term	The impact will last up to the end of the construction phase, where after it will be entirely negated in a period shorter than 3 years after the completion of construction activities.
Long term	The impact will continue for the entire operational lifetime of the development but will be mitigated by direct human action or by natural processes thereafter.
Permanent	This is the only class of impact that will be non-transitory. Such impacts are regarded to be irreversible, irrespective of what mitigation is applied.

Determination of Probability:

Improbable	The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
Probable	There is a possibility that the impact will occur to the extent that provisions must therefore be made.
Highly probable	It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up to mitigate the activity before the activity commences.
Definite	The impact will take place regardless of any prevention plans.

Determination of Significance (without mitigation):

No significance	The impact is not substantial and does not require any mitigation action.
Low	The impact is of little importance but may require limited mitigation.

Medium	The impact is of sufficient importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium-High	The impact is of high importance and is therefore considered to have a negative impact. Mitigation is required to manage the negative impacts to acceptable levels.
High	The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.
Very High	The impact is critical. Mitigation measures cannot reduce the impact to acceptable levels. As such the impact renders the proposal unacceptable.

Determination of Significance (with mitigation):

No significance	The impact will be mitigated to the point where it is regarded to be insubstantial.
Low	The impact will be mitigated to the point where it is of limited importance.
Medium	Notwithstanding the successful implementation of the mitigation measures, the impact will remain of significance. However, taken within the overall context of the project, such a persistent impact does not constitute a fatal flaw.
High	Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and taken within the overall context of the project, is considered to be a fatal flaw in the project proposal.

Determination of Reversibility:

Completely Reversible	The impact is reversible with implementation of minor mitigation measures
Partly Reversible	The impact is partly reversible but more intense mitigation measures
Barely Reversible	The impact is unlikely to be reversed even with intense mitigation measures
Irreversible	The impact is irreversible, and no mitigation measures exist

Determination of Degree to which an Impact can be Mitigated:

Can be mitigated	The impact is reversible with implementation of minor mitigation measures
Can be partly mitigated	The impact is partly reversible but more intense mitigation measures
Can be barely mitigated	The impact is unlikely to be reversed even with intense mitigation measures
Not able to mitigate	The impact is irreversible, and no mitigation measures exist

Determination of Loss of Resources:

No loss of resource	The impact will not result in the loss of any resources
Marginal loss of resource	The impact will result in marginal loss of resources
Significant loss of resources	The impact will result in significant loss of resources
Complete loss of resources	The impact will result in a complete loss of all resources

Determination of Cumulative Impact:

Negligible	The impact would result in negligible to no cumulative effects
Low	The impact would result in insignificant cumulative effects
Medium	The impact would result in minor cumulative effects
High	The impact would result in significant cumulative effects

Determination of Consequence significance:

Negligible	The impact would result in negligible to no consequences
Low	The impact would result in insignificant consequences
Medium	The impact would result in minor consequences
High	The impact would result in significant consequences