**Appendix D4: Updated Visual Impact Assessment/Addendum (2017 revision)**

# KEIMOES, PORTION ERF 666: SOLAR ENERGY FACILITY

## VISUAL ASSESSMENT
## ADDENDUM A

**For consideration in the Basic Assessment**
**For**

**EnviroAfrica**
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**Addendum A (March 2017) to original Report (2012)**

**Compiled by:**
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GeoStratics

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**Report history:**

| Version | Date | Amendments |
|---|---|---|
| Version 1 | 26 March 2012 | |
| Final | 11 May 2012 | |
| Addendum | 18 March 2017 | |

**CONTENT**



**Tables**



**Figures:**

**Relevant Qualifications & Experience of the Author**
Ms Sarien Lategan holds a Honours Degree in Geography as well as a Masters Degree in Town and Regional Planning from the University of Stellenbosch. She has 7 years experience as Town planner at a local government, 3 years with South African national Parks as planner and project manager of various GEF and World Bank managed, tourist facilities in the Table Mountain National Park and since 2004 as private practitioner involved in inter alia Site Analysis and Visual Impact assessments for various types of developments ranging from housing, tourism to infrastructure developments.

Ms Lategan is registered as a professional Town and Regional Planner as well as Environmental Assessment Practitioner.

**Declaration of Independence**

I, Sarah C. Lategan, fully authorized by Geostratics CC, declare that I am an independent consultant to EnviroAfrica and neither myself nor Geostratics, has any business, financial, personal or other interest in the proposed project or application in respect of which I was appointed, other than fair remuneration for work performed in connection with the application. There are furthermore no circumstances which compromise my objectivity in executing the task appointed for.

SC Lategan

## EXECUTIVE SUMMARY

Sarien Lategan of Geostratics was appointed to undertake the visual impact assessment of a maximum 10Megawatt solar facility, as input to the Basic Assessment in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 by undertaken EnviroAfrica. The development of the solar farm is proposed by Keren Energy (Pty) Ltd. The site on which the facility is planned comprises a portion of Erf 666, Keimoes and in ownership of the Kai Garib local municipality..

An environmental authorization was obtained but has since expired. A new application will now be submitted for which the original VIA needs to be re-assessed to accommodate any changes that may have occurred since the original assessment as well as include an assessment of cumulative impacts. This report serves as an addendum to the original VIA for this purpose and should be read with the original report.

At the time of the original assessment a final decision was not yet been taken on the exact technology or mix of technology to be used in the development and therefore the worst case scenario was followed by assessing the technology most probably going to have the highest visual impact in terms of size of structures. For the purposes of the original study thus, tracking CPV units of dimensions 15,64m in height and 17m wide has been assessed. The technology currently proposed comprise single axis tracking system with a max tilt of 50°. This setup results in infrastructure to be significantly lower than the units assessed in the original VIA and therefore has a significant lower visual impact.

The overall conclusion in the original assessment was that the visual impact is within acceptable levels and could thus be recommended. Due to the nature of the type of technology, little mitigation measures can be implemented to further reduces any potential visual impacts. With the technology now proposed the visual impact is even further reduced.

With regard to cumulative impacts it is concluded in this addendum that no significant cumulative visual impacts will arise from the development and it is thus within the acceptable level of change.

It can thus be concluded that the overall visual impact of the new application is similar and even slightly less than the original proposal and from a visual perspective can be considered for approval. No additional mitigation measures are required.

# 1 OBJECTIVE

In 2012, Sarien Lategan of Geostratics was appointed to undertake the visual impact assessment of a maximum 10Megawatt solar facility, as input to the Basic Assessment in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 by undertaken EnviroAfrica. The development of the solar farm is proposed by Keren Energy (Pty) Ltd. The site on which the facility is planned comprises a portion of Erf 666, Keimoes and in ownership of the Kai Garib local municipality.

An environmental authorization was obtained but has since expired. A new application will now be submitted for which the original VIA needs to be re-assessed to accommodate any changes that may have occurred since the original assessment as well as include an assessment of cumulative impacts. This report serves as an addendum t.o the original VIA for this purpose and should be read with the original report.

The objective of this addendum is to access changes that occurred since the original VIA and the subsequent impact thereof on the recommendations. It will futher more also assess the cumulative impacts of the proposal.

The changes that may have occurred includes the following:

1. Changes in the proposal namely -
    a. Site boundary
    b. Extent of solar production
    c. Technology
2. Changes in the receiving environment

Cumulative impact holds two components namely the visual catchment area of assement and the criteria as defined by the DEA guideline on cumulative impacts.
It is important to note that the original VIA did assess impacts within the normal visual sphere of observation namely 30km.

# 2 CHANGES IN PROPOSAL

## 2.1 Site Boundary

The site boundary remained similiar to the effect that it will not change the assessment of the receptors as per the original report. Therefore the previous assessment of receptors remains unchanged. The solar facility link to the adjacent substation with 22kV power lines and thus add no additional elements to the original assessment.


**Figure 1: Site boundary**

## 2.2 Extend of solar facility and power line connection

The proposal has been changed from the assessed extent of 10MW to a final proposal of 5MW. The footprint area however remains the same. The visual impact is thus similar to the original proposal.

The proposed 22kV powerline is similar to telephone line in extent and connect to the adjacent Oasis substation within the original defined area of assessment.

## 2.3 Proposed Technology

At the time of the original assessment a final decision was not yet been taken on the exact technology or mix of technology to be used in the development and therefore the worst case scenario was followed by assessing the technology most probably going to have the highest visual impact in terms of size of structures. For the purposes of the original study thus, tracking CPV units of dimensions 15,64m in height and 17m wide has been assessed.

The technology currently proposed, comprise is a crystalline PV single axis plant. It has 18540 solar modules connected to 7 central inverters, and makes use of Exosun single axis trackers. The facility will be connected to Eskom's Ouplaas Substation.
This proposal result in significant downscale in the size of infrastructure being less intrusive. The orignal proposal comprise units of up to 6m in height where the PV single axis system is approximately 2m.

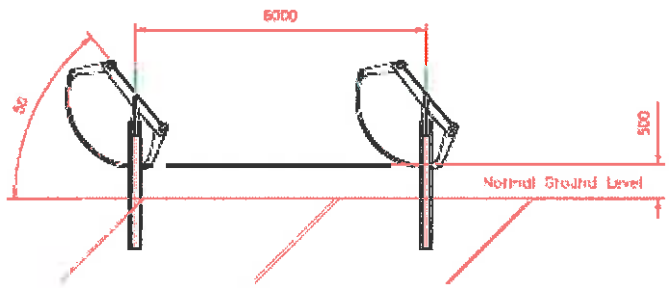



**Figure 2: Single axis mounting system**

No changes has been made to site parameter fencing and type of access roads.

The new proposed technology therefor reduce the visual impact with regard to the production technology.

# 3 CHANGES IN RECEIVING ENVIRONMENT

No changes occurred in the receiving environment which impact on the original assessment.

# 4 CUMULATIVE IMPACTS

## 4.1 Methodology

Ccumulative effects occur when:

- Impacts on the environment take place so frequently in time or so densely in space that the effects of individual impacts cannot be assimilated; or
- The impacts of one activity combine with those of another in a synergistic manner

DEAT has issued a guideline which identify types and characteristics of different cumulative effects.[1] Table 1 below summarise these criteria and these have been used to assess the cumulative visual impact.

**Table 1: Types and characteristics of cumulative impacts**

| TYPE | CHARACTERISTIC |
|---|---|
| Time Crowding | Frequent and repetitive effects. |
| Time Lags | Delayed effects. |
| Space Crowding | High spatial density of effects. |
| Cross-boundary | Effects occur away from the source. |
| Fragmentation | Change in landscape pattern. |
| Compounding Effects | Effects arising from multiple sources or pathways. |
| Indirect Effects | Secondary effects. |
| Triggers and Thresholds | Fundamental changes in system functioning and structure. |

DEAT also require that cumulative impacts of all energy projects within a 30km radius be assessed.

## 4.2 Assessment of cumulative impacts

### 4.2.1 Time Crowding

There are a number of PV sites to the east along the N14 and should these all commence with construction in the same timeframe, it will result in crowding during construction. However this is only temporary. and thus the impacts will be limited.

With regard to operational visual impact of a static land use change as proposed, this aspect is not relevant.

### 4.2.2 Time Lags

The facility does not change in its visual appeal over time and therefore there are no visual time lag effects.

### 4.2.3 Space crowding

The landscape consists of a valley with a hinterland to the north and south of this valley. The immediate hinterland to the south consist or hills and almost rocky/mountainous appearance. The hinterland to the north is more flat, but with interspersed hills, 'spitskoppe' and dunes. In general the area displays a surprisingly high variety in slope, hills, gradients and landform. These variations in landform reduce the visual reach and the view catchment of the area. The catchment area is thus restricted in the east, south and west to a maximum of 1km, but due to the up slope to the north and northwest the catchment area extent to the hills just north of the site at approx 4,5km. The maximum catchment area has thus been determined at approximately 5km.
(Refer Figure 3 below)

This thus concluded that the catchment area does not extent to the 30km radius. However a traveller on the N14 will be exposed to a number of solar energy site, especially towards the east. Most of the sites will most probably partially screened from the road and the view of these sites will occur at intervals for a distance of approximately 30km. This area is however a production landscape within which various infrastructure exist and the exposure can be absorb within the landscape. The proposal site adjacent to the substation also link the facility visually with the existing infrastructure and is close to town, thus resulting in an acceptable level of change.

[1] DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria

### 4.2.4 Cross Boundary
From a visual perspective the site has no cross boundary impacts.

### 4.2.5 Fragmentation
The position of the site adjacent the existing substation group it with similar infrastructure and thus not cause fragmentation of the visual landscape.

### 4.2.6 Compounding Effects
From a visual perspective the site has no compounding impacts.

### 4.2.7 Indirect Effects
The development is on the edge of the urban development and does has the potential to attract further development. The support services anticipated should however be of low impact such as general maintenance services as the facility does not require large scale industrial maintenance systems of equipment. The anticipated indirect visual effects are thus insignificant.

### 4.2.8 Triggers and Thresholds
From a visual perspective the site has no impacts on Triggers and Thresholds.

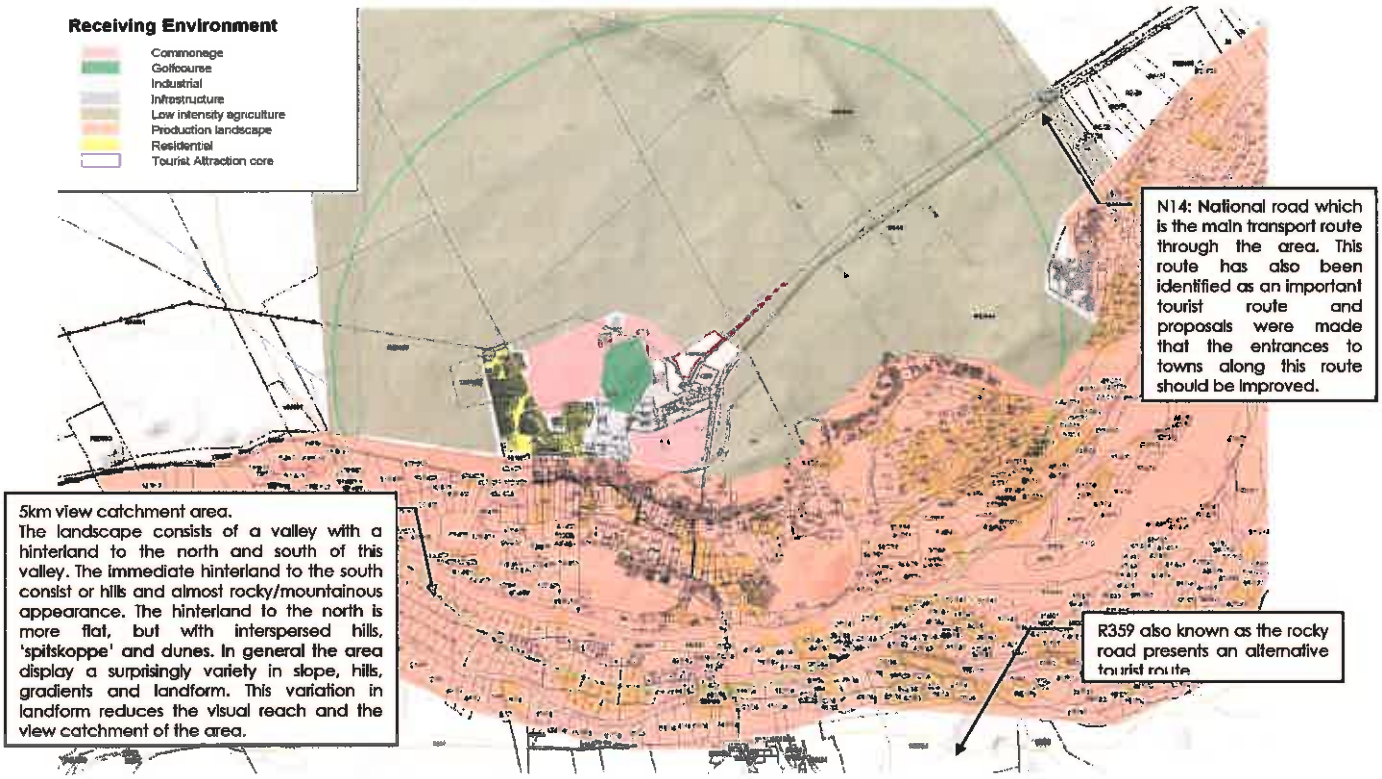



**Figure 3: View catchment and site elements**

Prepared by: SC Lategan
March 2017

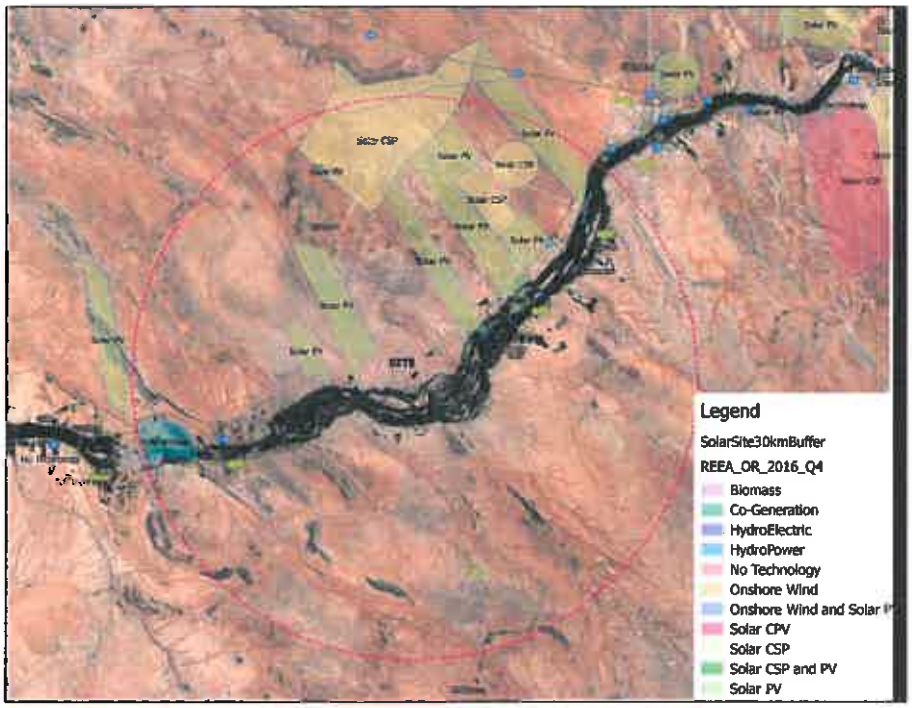



**Figure 4: 30km radius**

# 5 FINDINGS AND CONCLUSIONS

## 5.1 Construction Impacts

During construction, various large earth moving equipment and equipment will be transported to the site and work on the site. This will impact on the general experience of viewers. This impact is however temporary and not uncommon during construction of infrastructure. Communities have fairly high tolerance levels for such activities if it contributes to the infrastructure of the area.
Rating: Low

## 5.2 Operational Impacts

The proposed site is situated within the urban edge zone of Keimoes in an area characterized by little urban coherence nor rural, agricultural or wilderness sentiments. The larger area reflects the characteristics of a production to urban landscape and the site is situated within the land use continuum.

The valley area with its higher range of elements has a high visual absorption rate. The valley wall zones are not steep and therefore urban and infrastructure has developed on the areas. Due to their gradient they too reflect a high rate of visual absorption. Moving out of the valley area above the valley walls into the deep hinterland, the absorption rate reduces where the landscape is flat, but in areas with more gradient variation the absorption rate is still medium.

**Statement 1**: The nature and extent of the proposed development is such that it would not change the nature of land use of the area it is situated in.

**Statement 2**: Due to the medium to high absorption capacity of the landscape, the development will easily be absorbed into the existing visual structure.

**Statement 3**: The proposal does not pose any significant cumulative visual impacts which would deem the proposal unacceptable.

# 6 MITIGATION MEASURES

The level of visual impact is of such level that no mitigation to the proposed development elements is recommended. The impact can however be used as a resource by providing a tourist interpretation centre/facility to raise awareness amongst local residents and visitors to the site. Such facility can also serve as a practical demonstration of the region's commitment to sustainable development and responsible tourism and motivate the cumulative impacts as a benefit.

**Appendix D4: Visual Impact Assessment**
**(Original report)**

# VISUAL ASSESSMENT

**Prepared by:**
**S.C. Lategan**

**For consideration in the Basic Assessment for Keimoes solar facility**

**March2012**

**CONTENT**



**Tables:**



**Figures:**

# 1 TERMS OF REFERENCE

The applicant intends the development of a solar farm on a portion of Erf 666, commonage in Keimoes. The site gain access off the N14.

The objective of the Visual Impact assessment is to determine the significance of any visual impact. This assessment will indicate whether from a visual perspective the development constitute and acceptable level of change and if so what potential mitigation measures can reduce any visual impact as to limit

To determine the potential extent of the VIA required the following broad criteria are considered.

| | |
|---|---|
| Areas with protection status, e.g. nature reserves | None |
| Areas with proclaimed heritage sites or scenic routes | None. |
| Areas with intact wilderness qualities, or pristine ecosystems | None. |
| Areas with intact or outstanding rural or townscape qualities | None |
| Areas with a recognized special character or sense of place | None |
| Areas with sites of cultural or religious significance | None |
| Areas of important tourism or recreation value | The site is in a region where such elements exists and are important in the Green Kalahari tourist route |
| Areas with important vistas or scenic corridors | To assess. |
| Areas with visually prominent ridgelines or skylines. | None |

**Table 1: Requirements for visual assessment**

| | |
|---|---|
| High intensity type projects including large-scale infrastructure | yes |
| A change in land use from the prevailing use | Yes, from vacant to utility/infrastructure |
| A use that is in conflict with an adopted plan or vision for the area | No |
| A significant change to the fabric and character of the area | Potentially |
| A significant change to the townscape or streetscape | Potentially |
| Possible visual intrusion in the landscape | Potentially |
| Obstruction of views of others in the area | Potentially |

**Table 2: Nature of intended development**

From the above it is clear that the receiving environment holds certain visual elements which may be impacted upon by development of the site.

It is thus clear that the potential exist that development of the site may have a visual impact. In order to assist authorities thus to make an informed decision, the input of a specialist is required to assist in the project design and assess the visual impact of the preferred project proposal.

The term visual and aesthetic is defined to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape. The terms of reference for the specialist is to:

- Provide the visual context of the site with regard to the broader landscape context and site specific characteristics.
- Provide input in compiling layout alternatives.
- To describe the affected environment and set the visual baseline for assessment
- Identify the legal, policy and planning context
- Identifying visual receptors
- Predicting and assessing impacts
- Recommending management and monitoring actions

# 2 Methodology and principles

## 2.1 Methodology

**Table 4: Summary of methodology**

| Task undertaken | Purpose | Resources used |
|---|---|---|
| A screening of the site and environment | To obtain an understanding of the site and area characteristics and potential visual elements | Photographs<br>Site visits |
| Identify visual receptors | To assess visual impact from specific view points | Photographs, profiles |
| Contextualize the site within the visual resources | To present an easy to understand context of the site within the visual resource baseline | Specialist: S Lategan<br>Graphic presentation<br>Superimposed photo's<br>Model in case of high significance |
| Propose possible mitigation measures | To present practical guidelines to reduce any potential negative impacts. | Specialist: S. Lategan |

Throughout the evaluation the following fundamental criteria applied:

- An awareness that "visual' implies the full range of visual, aesthetic, cultural and spiritual aspects of the environment that contribute to the area's sense of place.
- Consideration of both the natural and cultural (urban) landscape, and their inter-connectivity.
- The identification of all scenic resources, protected areas and sites of special interest, as well as their relative importance in the region.
- Understanding of the landscape processes, including geological, vegetation and settlements patterns which give the landscape its particular character or scenic attributes.
- The inclusion of both quantitative criteria, such as visibility and qualitative criteria, such as aesthetic value or sense of place.
- The incorporation of visual input as an integral part of the project planning and design process, so that the findings and recommended mitigation measures can inform the final design and quality of the project.
- To test the value of visual/aesthetic resources through public involvement.

### 2.1.1 Principles

The following principles to apply throughout the project:

- The need to maintain the integrity of the landscape within a changing land use process
- To preserve the special character or 'sense of place' of the area
- To minimize visual intrusion or obstruction of views
- To recognize the regional or local idiom of the landscape.

### 2.1.2 Fatal flaw statement

A potential fatal flaw is defined as an impact that could have a "no-go" implication for the project. A "no-go" situation could arise if the proposed project were to lead to (Oberholzer, 2005):

1. Non-compliance with Acts, Ordinance, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of stakeholders and decision-makers to be unacceptable.

The screening of the site and initial project intentions did not reveal any of the above issues which may result in a fatal flaw.

## 2.2 Legal Framework, Guidelines and policies

### 2.2.1 National Environmental Management Act, 107, 1998 and relevant Guidelines:

An assessment in terms of any activity that required an EIA or Basic Assessment may be subjected to a specialist visual assessment in order to determine the significance of the potential impacts to result from a proposed activity.

The National Dept has subsequently determined that all applications for solar farms are subject to a visual impact assessment.

### 2.2.2 Northern Cape PSDF

The NCPSDF identified various use zones.
The PSDF provides guidance to ensure that

- development is of a quality that promotes environmental integrity.
- based upon the principles of 'critical regionalism" which promotes a return to the development of high-quality settlements.
- remised upon "The Big Five" principles that guide the planning, design and management of development namely sense of place, sense of history, sense of nature, sense of craft and sense of limits.

### 2.2.3 Green Kalahari tourism

The Green Kalahari tourist plan is an initiative to promote tourism in the region. Of importance to this specific application is the identification of the N14 as an important route and thus proposals that the entrances to town along the route be improved. The R359 has also been identified as an alternative tourist route. The protection of cultural and heritage resources as well as the active involvement and empowerment of local communities through tourism is a core theme through the tourism plan.

# 3 DEVELOPMENT PROPOSAL

## 3.1 General Description

Construction of Solar energy production facility ("Solar Farm") with a 10Megawatt capacity, consisting of 140 tracking CPV units, on approximately 20ha. Each unit have approximately 30m tracker clearance zone. Units are typically positioned in rows with access roads between every second row. Unit spacing typically varies between 43x37 and 33x30m.

**Figure 2: Typical CPV Unit**

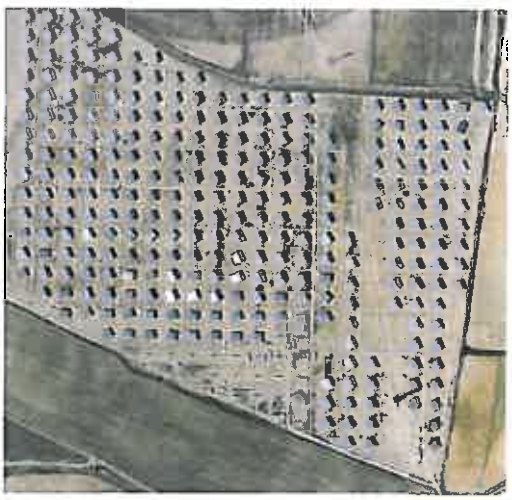


**Figure 1: Typical Solar Farm layout**

The Solar Farm include supportive infrastructure which consists of 2 -4 concrete transformer pads approximately 20x15m respectively, a fence construction staging area, maintenance shed and a switch panel for connection to the grid and transmission line from the transformers to the closest ESKOM substation.

## 3.2 Project Elements

### 3.2.1 Extent and layout

The Solar farm will occupy approximately 20ha. The nature of the tracking CPV units are such that the property has to be leveled to less than 1:5 gradient in order to prevent the units to touch the ground when turning on the pedestal. CPV units are positioned in a grid with the active panel side facing north. The units will rotate from east (morning) to west (afternoon). Back of units facing south. Units are position in rows of two with an access roads in between.

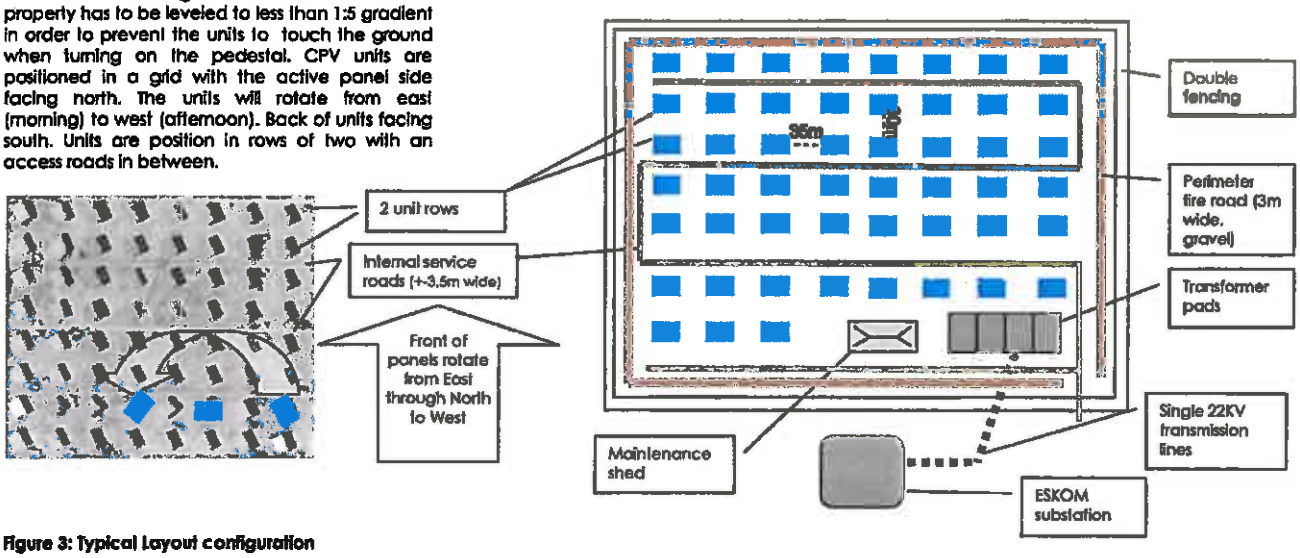



**Figure 3: Typical Layout configuration**

### 3.2.2 Tracking CPV Units

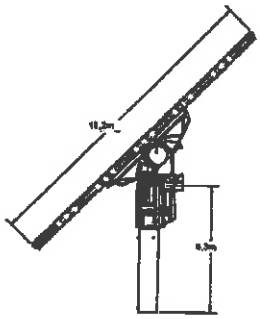
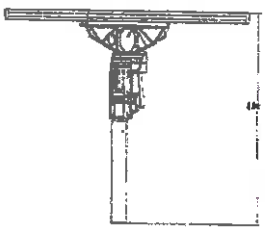


Figure 5: Typical Operational position



In stow: >28 mph. > 10 sec. Out of stow : <25 mph. >300 sec.

Figure 4: Storm Stow position

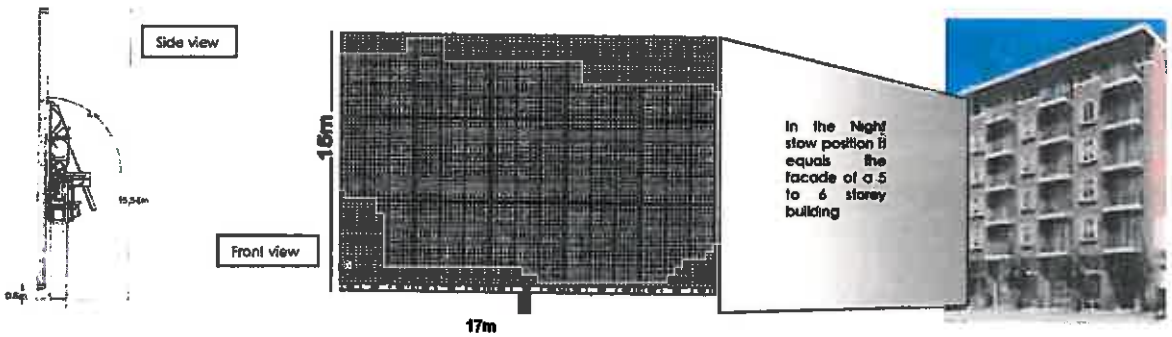



Figure 6: Night stow position

### 3.2.3 Project perimeter

Double fencing with inner fence consisting of galvanized palisade fence and outer an electrified fence of 2,4m in height.

Figure 7: Typical electrical fence

Figure 8: Typical galvanized palisade fence

### 3.2.4 Supportive infrastructure

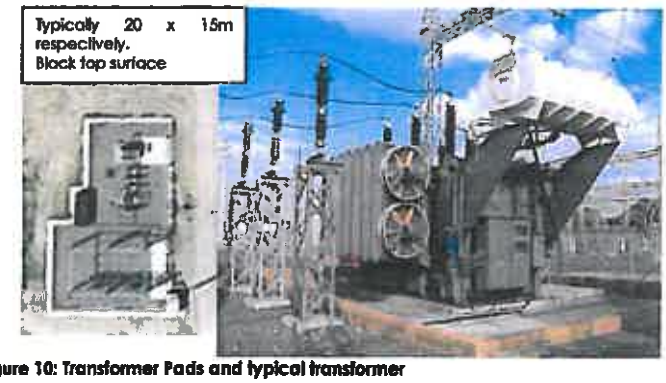




Figure 10: Transformer Pads and typical transformer

### 3.2.5 Operational elements

A pressure washer on a water truck with a de-ionizing nozzle is sufficient for most washes

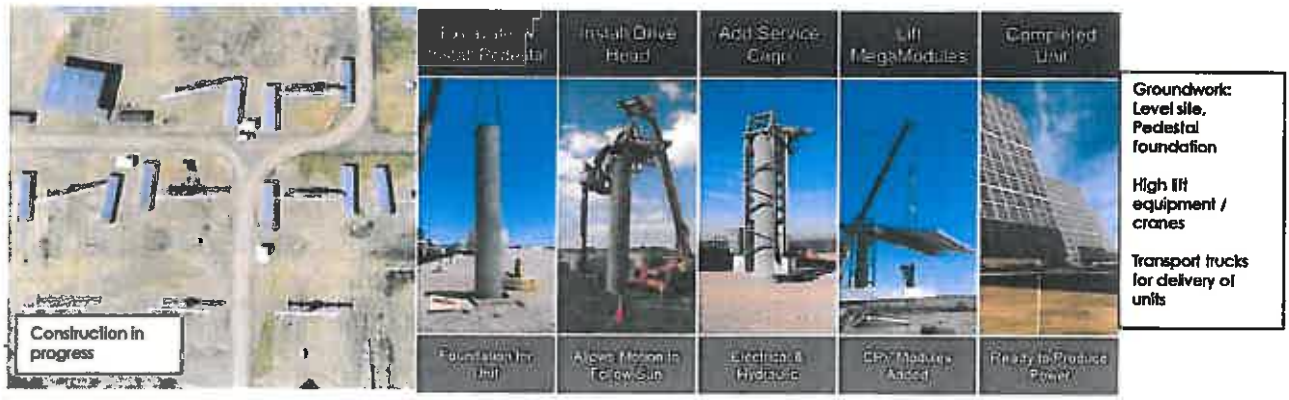
**Figure 12: High Pressure spray truck**

An occasional (~1/year) deep clean scrub may be necessary to clean the lenses

Once a year, cleaning teams will access the site and physically clean the panels. This is done either by rope access or the use of "cherry pickers"

**Figure 11: Annual physical cleaning**

## 3.3 Construction elements




Groundwork: Level site, Pedestal foundation

High lift equipment / cranes

Transport trucks for delivery of units

**Figure 13: Construction Elements**

# 4 RECEIVING VISUAL ENVIRONMENT

## 4.1 Description

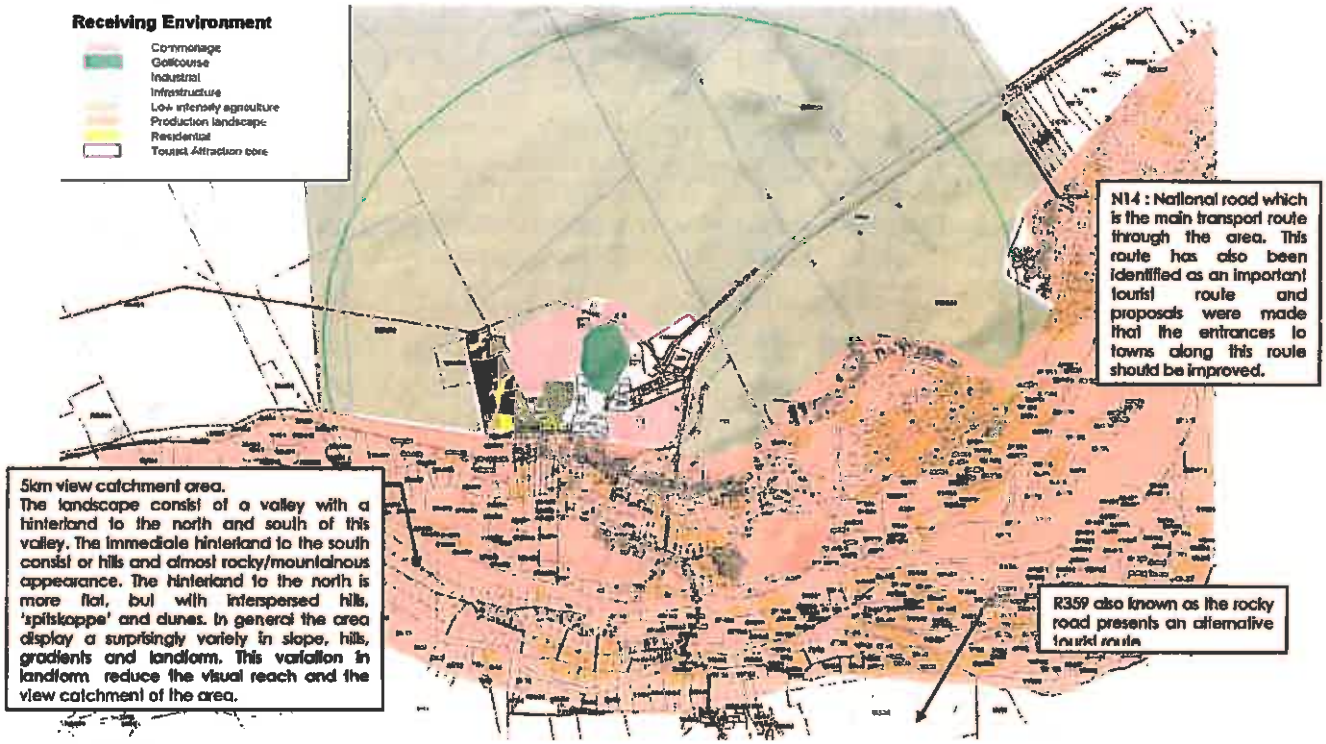



**Figure 14: Catchment area**

Prepared by: SC Lategan
March 2012

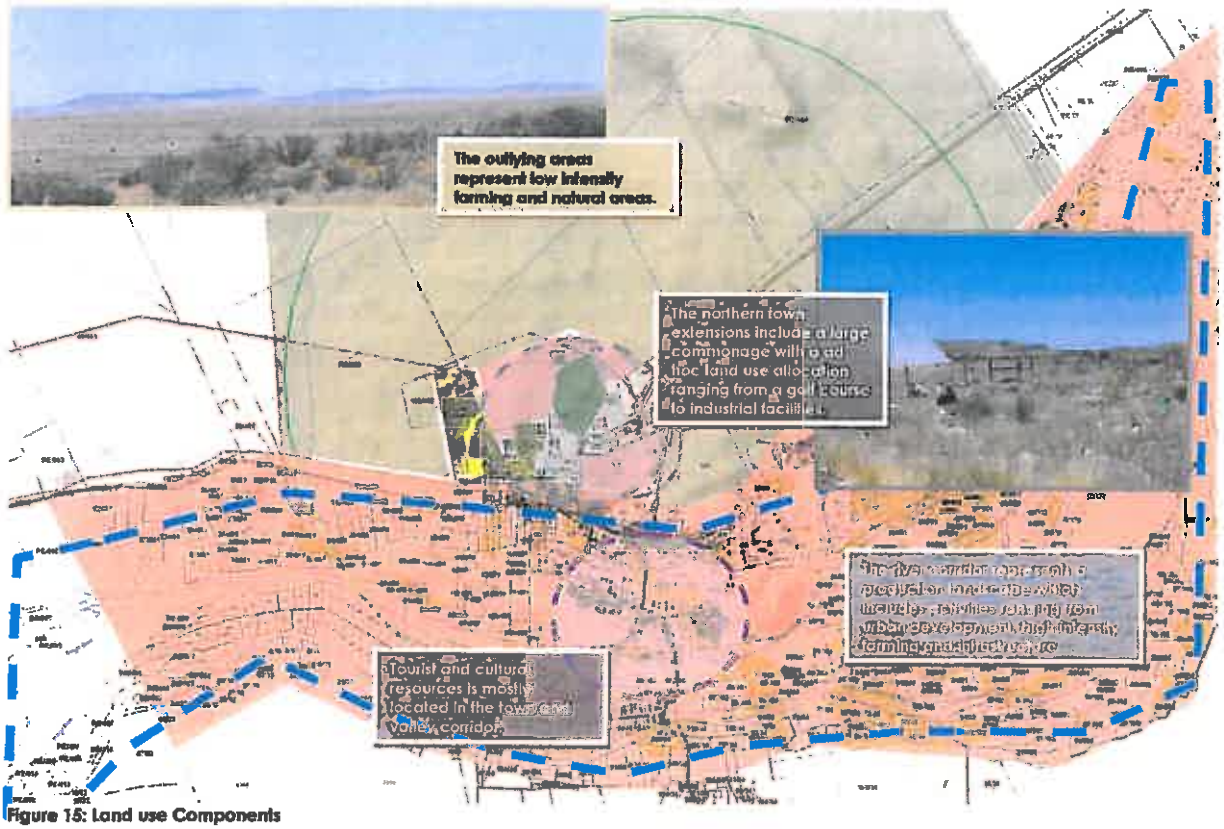



Figure 15: Land use Components

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March 2012


**Figure 16: Land use continuum**

The site is situated in the northern extension of the town on commonage. It is surrounded by infrastructure which include High voltage power lines, electrical substation, sewage works, landfill, railway line and gravel streets.
Other use in the area include industrial buildings, small holding type of residential-industrial mix and large vacant land. The golf course is situated almost in the centre of this large area. Residential neighbourhoods are located west of this area.
The area thus do not a have a well defined character and reflects a lack a sense of place.

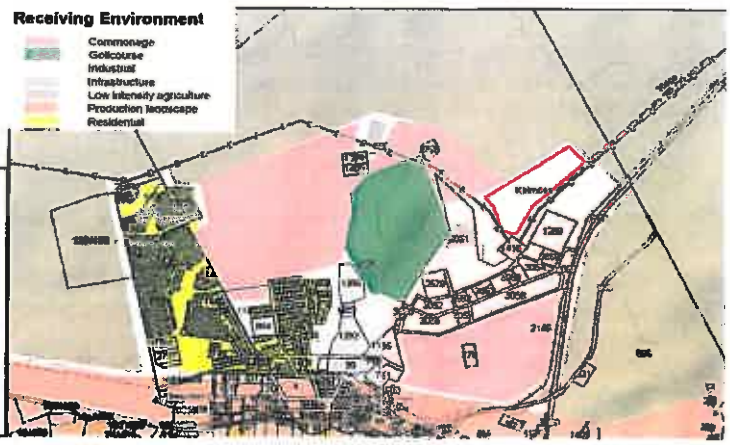



**Figure 17: Immediate Environment**

## 4.2 Findings

The proposed site is situated within the urban edge zone of Keimoes in an area characterized buy little urban coherence nor rural, agricultural or wilderness sentiments. The larger area reflects the characteristics of a production to urban landscape and the site is situated within the land use continuum.
The valley area with its higher range of elements have a high visual absorption rate. The valley wall zones are not steep and therefore urban and infrastructure has developed on the areas. Due to their gradient they too reflect a high rate of visual absorption. Moving out of the valley area above the valley walls into the deep hinterland, the absorption rate reduces where the landscape is flat, but in areas with more gradient variation the absorption rate is still medium.

**Statement 1:** The nature and extent of the proposed development is such that it would not change the nature of land use of the area it is situated in.
**Statement 2:** Due to the medium to high absorption capacity of the landscape, the development will easily be absorbed into the existing visual structure.

## 5 VISUAL RECEPTORS

| Label | Latitude | Longitude | Comment |
|---|---|---|---|
| Blucuso tourist accommodation | -28.66 | 20.98 | Hillock in front of facility screen direct view. |
| N14 direction Keimoes | -28.68 | 21 | Site visible from most western dune all the way until it is screened by the warehouse. |
| Golfcourse | -28.69 | 20.97 | Partially visible |
| Red Sun Dried fruit warehouse | -28.69 | 20.98 | Direct view. Industrial facility. |
| Industrial properties | -28.7 | 20.98 | Partially screened by substation. industrial facilities |
| Orangeriver Wine cellar | -28.7 | 20.97 | Partially screened by substation, old sewage works and landscape features (gradient). |
| N14 direction Upington | -28.7 | 20.98 | Substation and warehouse largely screen site. Visible for a brief moment as you cross the bridge leaving town. |
| N14 direction Upington, bridge | -28.7 | 20.98 | Topography and infrastructure provide only glimpses of site. |
| R359 highest point | -28.74 | 20.93 | Potential brief glimpse of site in distance |

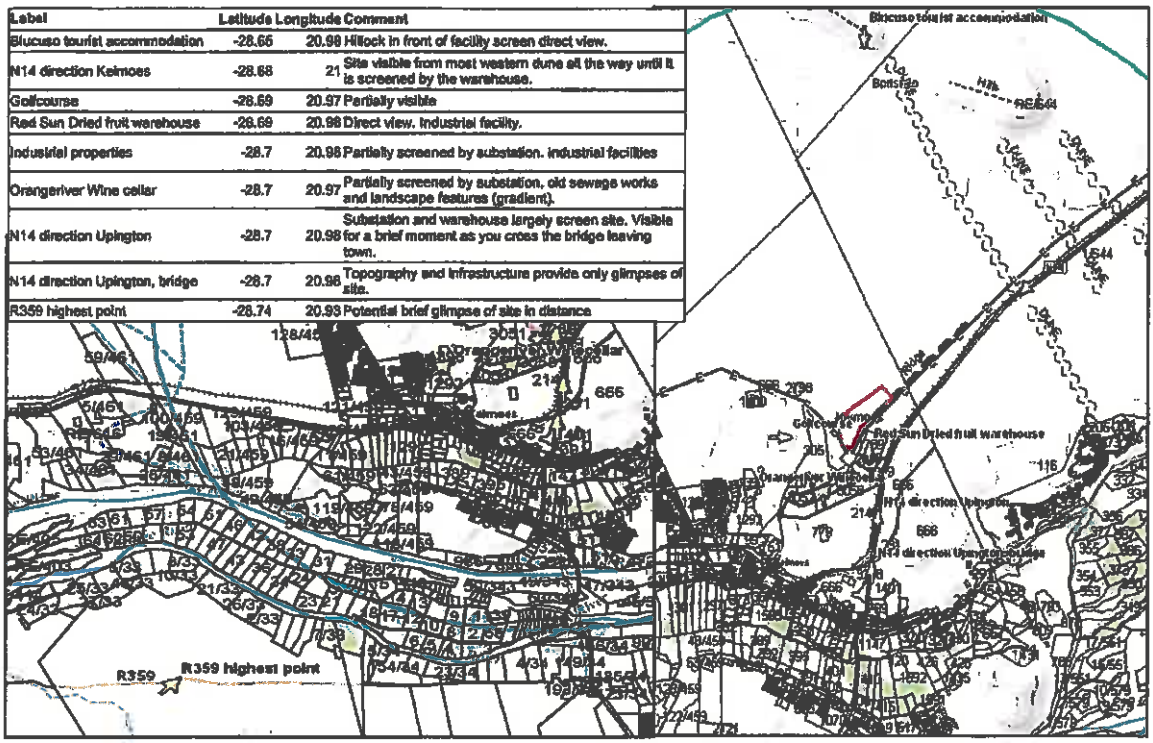



**Figure 18: Identified visual receptors**

Prepared by: SC Lategan
March 2012

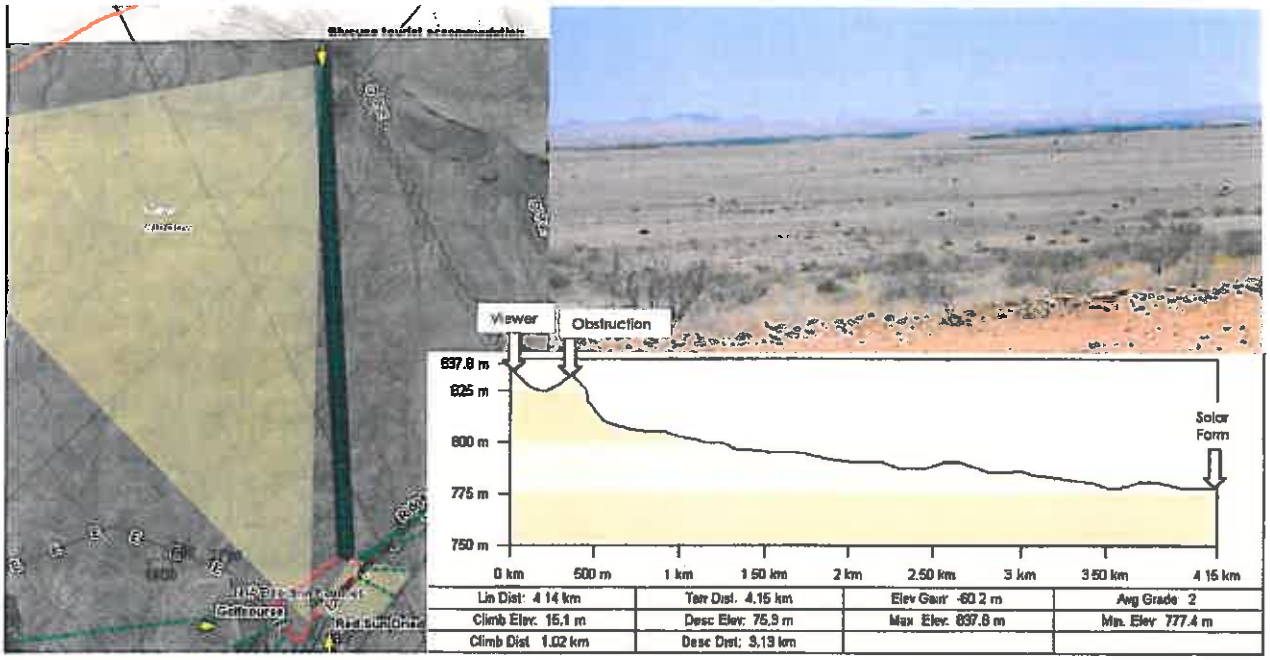
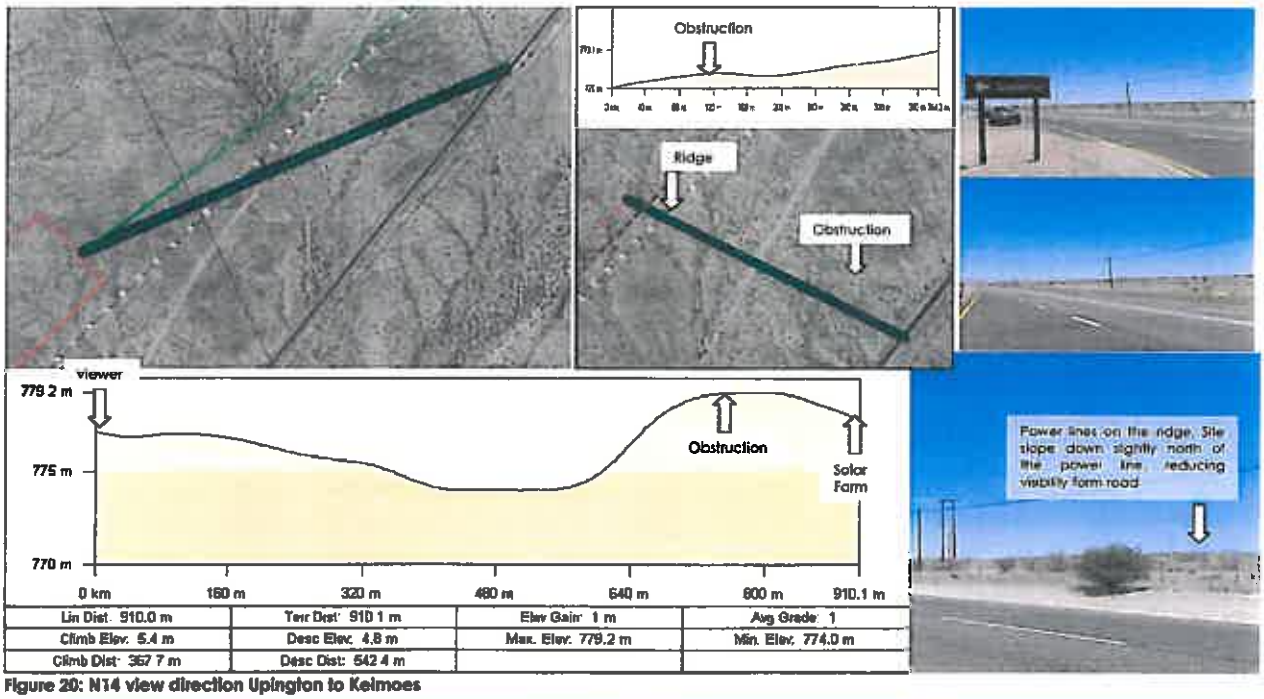



**Figure 19: Visual Receptor - Blucuso tourist facility**

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | dominant, clearly visible | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | | sporting, recreational, places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

**Table 3 : Visual Impact - Blucuso**

Prepared by: SC Lategan
March 2012




| | | | |
|---|---|---|---|
| Lin Dist: 910.0 m | Terr Dist: 910.1 m | Elev Gain: 1 m | Avg Grade: 1 |
| Climb Elev: 5.4 m | Desc Elev: 4.8 m | Max. Elev: 779.2 m | Min. Elev: 774.0 m |
| Climb Dist: 357.7 m | Desc Dist: 542.4 m | | |

**Figure 20: N14 view direction Upington to Keimoes**

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | dominant, clearly visible | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | | sporting, recreational, places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

**Table 4: N14 Upington to Keimoes view assessed**

Prepared by: SC Lategan
March 2012

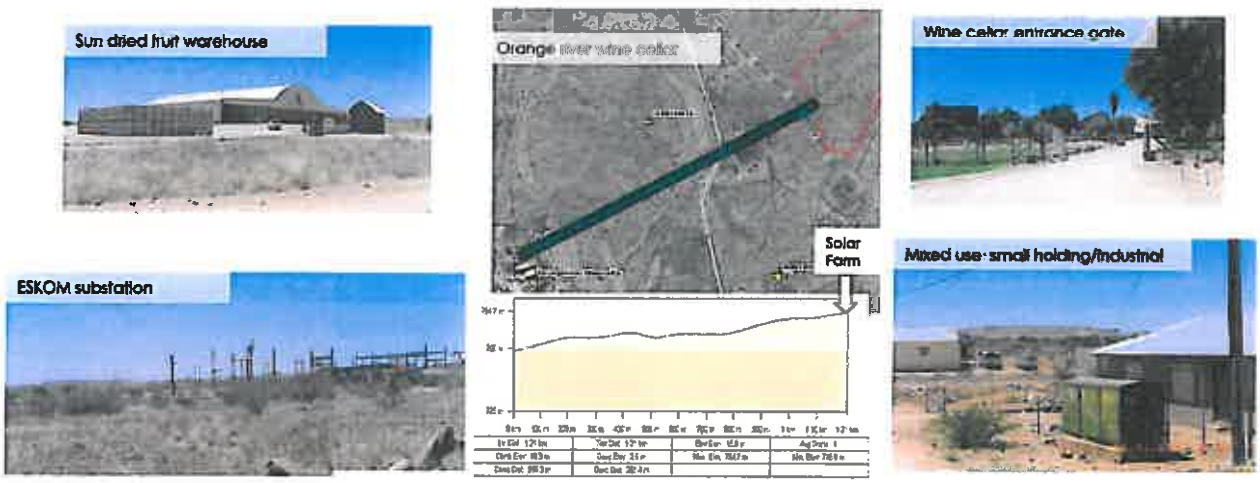



**Figure 21: Commonage precinct as receptor**

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | residential, nature reserves, scenic routes | sporting, recreational places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

**Table 5: Commonage as receptor**

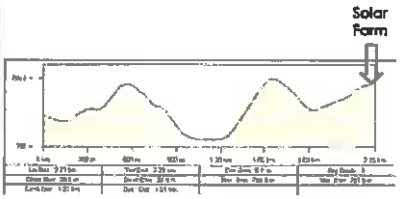




Figure 22: Residential area to the west

Residential area to the west: Various landscape and topographical features screen the residential area from the site. This area is thus not a visual receptor although within the view catchment. No significant impact identified.

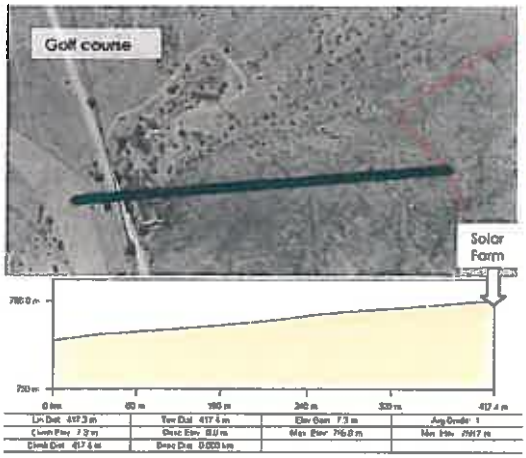
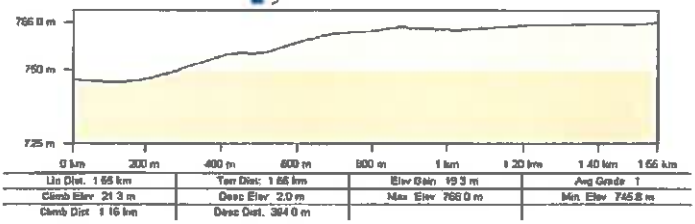



Figure 23: Golf course as visual receptor

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | dominant, clearly visible | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | residential, nature reserves, scenic routes | sporting, recreational, places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

Table 6: Golf course as receptor

View from most of the golf course is obscured by landscape elements and the topography. The site is significantly higher than the golf course and therefore any development on the site is above the view level of viewers. Glimpses from different areas on the golf course is possible, but these would be brief.



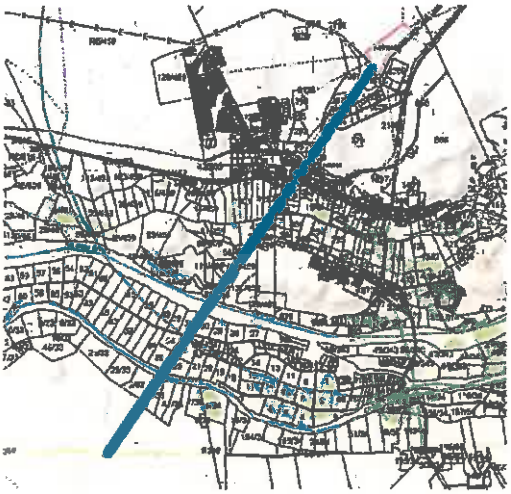

Travelling on the N14 out of Keimoes, direction Upington, the bridge lift the road for a brief moment above the landscape. From this point the site would be visible for a brief moment before the road slopes down again and the site disappear behind landscape elements and the traveller pass the site.

**Figure 24: N14 direction Upington**

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | dominant, clearly visible | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | | sporting, recreational, places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

**Table 7: N14 direction Upington as receptor**

Prepared by: SC Lategan
March 2012



The R359 between Keimoes and Kakamas to the south of the river, has been identified as an alternative tourist route and is known as the "rockery" road. The road is more than 7km from the site. The profile indicates that the road at its highest point is lower than the site and thus the traveller on the R359 would see the valley wall on the other side of the valley but the site is above the viewers line of site .

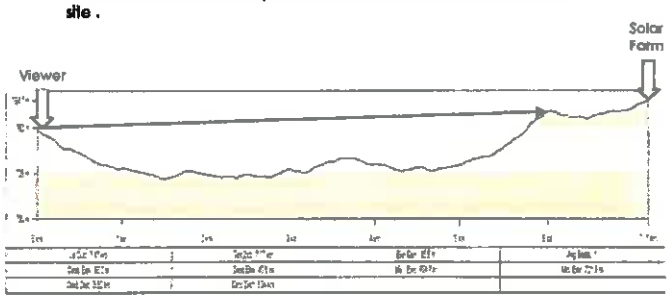



**Figure 25: R359 as visual receptor**

| Criteria | High | Moderate | Low |
|---|---|---|---|
| Exposure | dominant, clearly visible | recognizable to the viewer | not particularly noticeable to the viewer |
| Sensitivity | | sporting, recreational, places of work | industrial, mining, degraded areas |
| Intrusion/Obstructive | noticeable change, discordant with surroundings | Partially fits but clearly visible | minimal change or blends with surroundings |

**Table 8: R359 as receptor**

| Label | Latitude | Longitude | Comment | Exposure | Sensitivity of receptor | Intrusion | Finding |
|---|---|---|---|---|---|---|---|
| Blucuso tourist accommodation | -28.65 | 20.98 | Hillock in front of facility screen direct view. | The receptor is more than 4km from the site. Due to the size of the solar farm, the distance diminish the impact to a large extent. Rate: Moderate | Tourist facilities are sensitive to landscape changes as they rely on the surrounding recourses to "sell" an experience. Rate: High | The position of the tourist facility is such that view is partially blocked by hillock. The distance to the development also reduce impact. The Solar Farm would thus not result in a significant change in the view landscape Rate: Low | No significant impact. |
| N14 direction Keimoes | -28.68 | 21 | Site visible from most western dune all the way until it is screened by the warehouse. | The site becomes visible after the road crosses the most western dune. The road is however lower than the site and thus partially disappear below the low ridge and than get screened by the warehouse. Rate: Moderate | The N14 has been identified as an important tourist route especially entrances to towns Rate: High | Due to the other infrastructure such as electrical power lines and the substation the site fits into the current land use of the immediate environment. Rate: Low | No significant impact. |
| Golf course | -28.69 | 20.97 | Partially visible | Only glimpses to the site visible Rate: Moderate | Recreational facility Rate: Moderate | Grouped with the electrical substation, behind the powerline, the solar farm will fit with the existing land use Rate: Low | No significant impact |
| Red Sun Dried fruit warehouse | -28.69 | 20.96 | Direct view. Industrial facility. | The site is visible from various places on the property. Directly behind the dried fruit warehouse it is dominant. The Orange river wine cellar on the other hand is sheltered through gradient variations Rate: High to moderate | Industrial related land use not sensitive to addition of utility use. Rate: Moderate | grouped with the electrical substation and industrial uses it fits with its immediate environment Rate: Low | No significant impact |
| Industrial properties | -28.7 | 20.98 | Partially screened by substation. Industrial facilities | | | | |
| Orangeriver Wine cellar | -28.7 | 20.97 | Partially screened by substation, old sewage works and landscape features (gradient). | | | | |
| N14 direction Upington | -28.7 | 20.98 | Substation and warehouse largely screen site. Visible for a brief moment as you cross the bridge leaving town. | The site is briefly visible from the bridge, but is then screened by landscape element Rate: Moderate | The N14 has been identified as an important tourist route especially entrances to towns Rate: High | Due to the other infrastructure such as electrical power lines and the substation the site fits into the current land use of the immediate environment. Rate: Low | No significant impact |
| N14 direction Upington, bridge | -28.7 | 20.98 | Topography and infrastructure provide only glimpses of site. | | | | |
| R359 highest point | -28.74 | 20.93 | Potential brief glimpse of site in distance | The road is more than 7km from the site. The road at its highest point is lower than the site, thus the traveller on the R359 would see the valley wall on the other side of the valley but the site is above the viewers line of Rate: Low | The R359 between Keimoes and Kakamas to the south of the river, has been identified as an alternative tourist route and is known as the "rockery" road Rate: High | Rate: Low | No significant impact |

**Table 9: Summary of Visual Receptor assessment**

# 6 CONSTRUCTION

During construction, various large earth moving equipment and equipment will be transported to the site and work on the site. This will impact on the general experience of viewers. This impact is however temporary and not uncommon during construction of infrastructure. Communities have fairly high tolerance levels for such activities if it contribute to the infrastructure of the area.
Rating: Low

# 7 FINDINGS

The site is situated in an area of little coherence and ad hoc position of a range of industrial and utility land uses. The site has a high absorption capacity due to the presence of existing land use and topographical variation.

The sensitive receptors namely the N14 and R359 is situated such that the exposure to the site and the intrusion is low.

The proposal does not present an unacceptable level of change to the visual environment and therefore the development can be recommended.

# 8 MITIGATION MEASURES

The level of visual impact is of such level that no mitigation to the proposed development elements are recommended. The impact can however be used as a resource by providing a tourist interpretation centre/facility to raise awareness amongst local residents and visitors to the site. Such facility can also serve as a practical demonstration of the region's commitment to sustainable development and responsible tourism.