

1. ASSESSMENT OF EACH IMPACT AND RISK IDENTIFIED FOR EACH ALTERNATIVE

Note: The following table serves as a guide for summarising each alternative. The table should be repeated for each alternative to ensure a comparative assessment. The EAP may decide to include this section as Appendix J to this BAR.

This impact assessment section of the report has been prepared with input from the following participating specialists:

1. **Terrestrial Biodiversity and species:** SDP Ecological Solutions
2. **Freshwater Biodiversity and species:** SDP Ecological Solutions
3. **Visual:** QARC, Quinton Lawson & Bernard Oberholzer
4. **Heritage:** ASHA Consulting, Jayson Orton
5. **Palaeontology:** Natura Viva, John Almond
6. **Avifauna:** Chris van Rooyen Consulting, Chris van Rooyen
7. **Socio-Economic:** Sandra Hill
8. **Agriculture and Soils:** Johann Lanz
9. **Ecology:** (Camera Monitoring):3 Foxes Biodiversity Solutions, Simon Todd

The impacts are firstly assessed per environmental theme, whereafter an Impact summary and Statement is provided.

ECOLOGICAL IMPACTS¹:

SDP Ecological Solutions undertook an Ecological Assessment for the associated PV Developments as well as this proposed access road, from which the following is summarised.

The Grootfontein site can be described as an elevated plateau that acts as a watershed between drainage to the north and drainage to the south.

The lower elevations of the site, particularly to the north are dominated by sheet wash plains and a larger ephemeral river system, the Droelaagte. Given this topography, two habitat forms or veld types are evident within the site, these being Tanqua Karoo, a form of the Succulent Karoo Biome and Tanqua Wash Riviere, a riparian habitat form (Mucina and Rutherford 2006). Notably, both these veld types are considered “least threatened” from a conservation perspective.

¹ This includes impacts in terms of both Terrestrial and Aquatic Biodiversity including animal and plant species assessments.

Findings confirmed a low level of ecological significance associated broadly throughout the terrestrial environment of the site. However, areas of moderate and high ecological sensitivity were encountered along the scarp slopes and sheetwash environments, which have the potential to provide suitable habitat for lithic and geophytic plants of conservation significance.

Such observations conform with the sensitivity 'screening tool', confirming low levels of faunal diversity being evident on higher ground within the Grootfontein area and most faunal populations being associated with the riverine environments. Based on the above, it is anticipated that faunal populations are concentrated in and around riparian areas or sandy environments, in association with improved foraging and the availability of water. Thus, the riparian environments are allocated a "high level" of ecological sensitivity on account of the increased faunal populations identified within these areas and the evident intermittent flooding that may affect these areas.

These sensitive features identified from a Terrestrial and Aquatic Biodiversity Perspective are shown in the figure below.

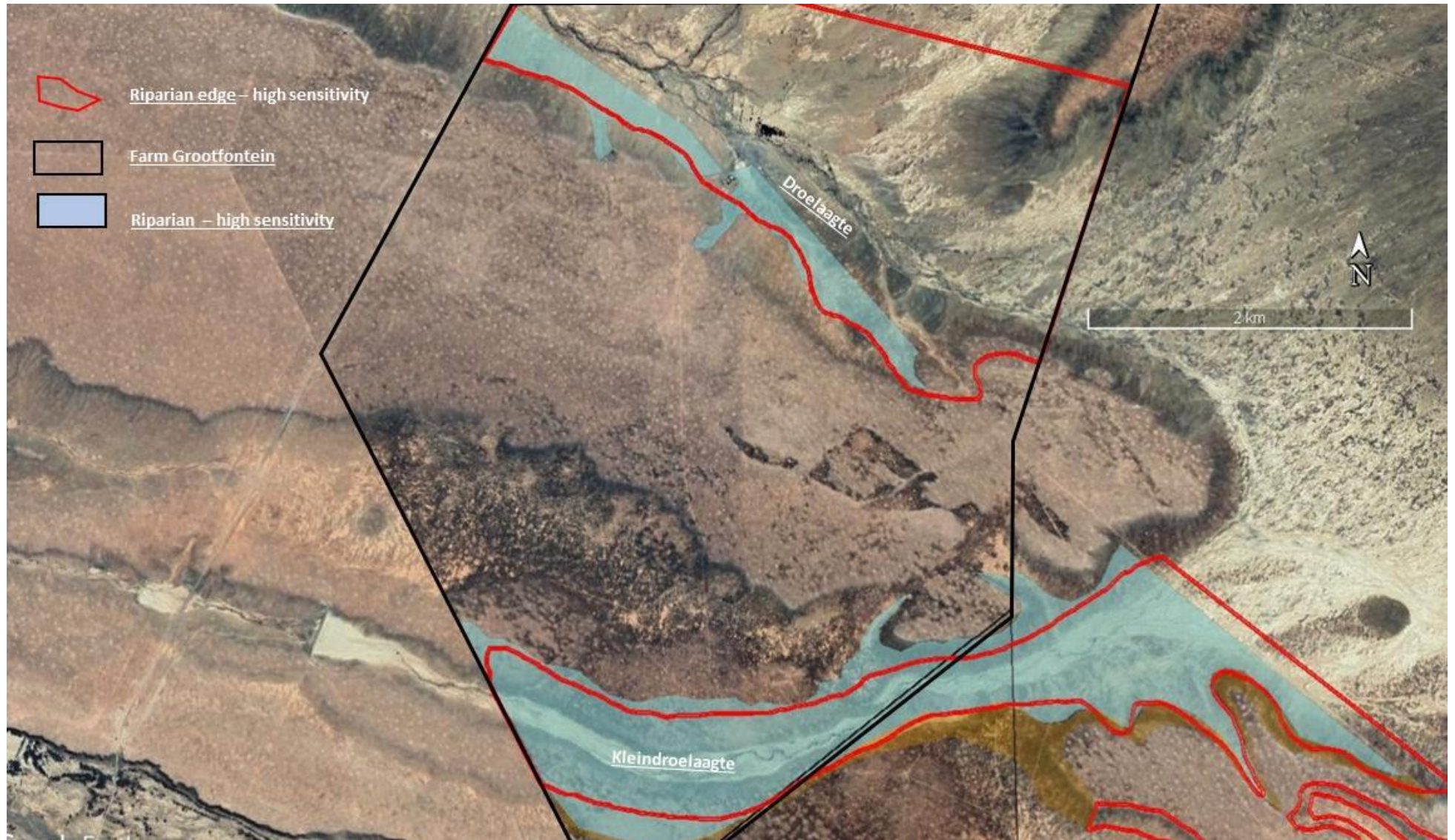
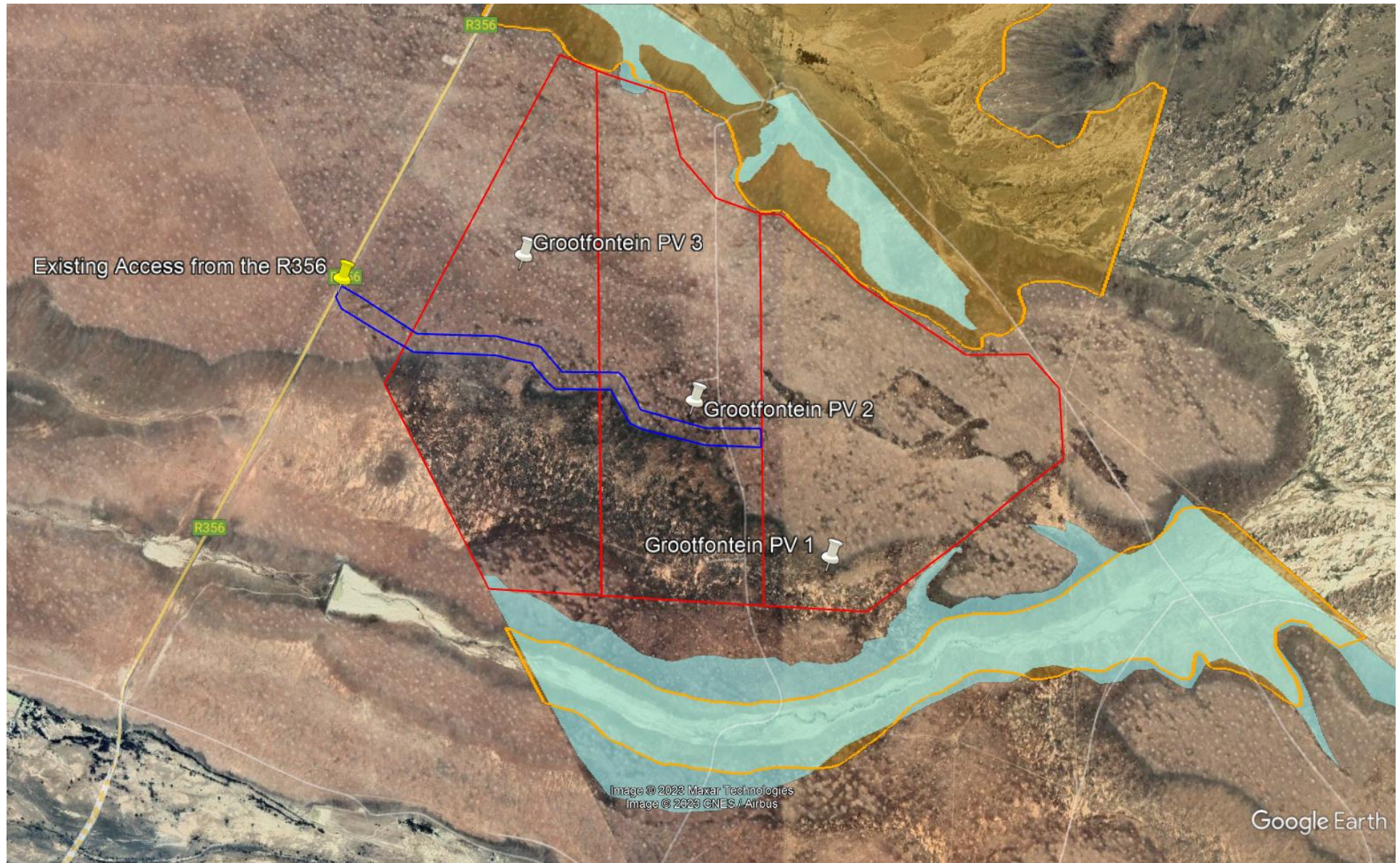


Figure 1: High Sensitivity Aquatic and Terrestrial Biodiversity Habitats identified on the affected farm portion and surrounding areas.

The selection of the preferred alignment of the road followed a risk adverse approach, where all these identified features were specifically avoided as shown in the Figure below.



Existing Access from the R356

R356

R356

Grootfontein PV 3

Grootfontein PV 2

Grootfontein PV 1

Image © 2023 Maxar Technologies
Image © 2023 CNES / Airbus

Google Earth

Figure 2: Showing the position of the proposed Grootfontein Access Road in relation to the areas identified as no go areas by the Terrestrial and Aquatic Biodiversity Specialists.

The specialist identified the following impacts from an aquatic and terrestrial biodiversity perspective.

- **Clearance of vegetation.**

Grubbing of vegetation along the proposed road route is required in order to accommodate the access roadway. As mentioned, the roadway is positioned atop the crest of an elevated landform, along level terrain. The botanical community encountered along the level, rocky terrain is typically of low diversity, comprising primarily of *Salsola* spp.

- **Disturbance of faunal refugia.**

Faunal associates are concentrated around riverine areas as well as along scarp interfaces with low levels of diversity encountered at higher elevations. Notably, *Chersina angulata* and *Parabuthus* spp are found at higher areas of elevation and have an increased probability of being affected by the proposed roadway. As the roadway avoids areas of exclusion (scarp and sheetwash areas), the disturbance of faunal refugia at this point is considered to be of low risk.

- **Alteration of surface hydrology.**

Mean annual rainfall of less than (<) 60 mm gives rise to the xeric nature of the subject site. Thus, storm water control issues are not likely to pose an issue in this regard, with little or no change to factors such as surface water percolation, surface drainage and flow patterns.

- **Dust, light, and other emissions.**

Aeolian driven particulate dust emissions are anticipated to increase during the construction phase as a consequence of vegetation clearance. Dust is considered to have a significant bearing on vegetation and photosynthetic function as well as browsing and grazing by herbivorous populations.

The significance of these impacts was assessed as follows:

Table 1: Assessment of the Aquatic and Terrestrial Biodiversity Impacts of the Proposed Grootfontein Access Road.

IMPACT	Intensity	Extent	Duration	Probability	Confidence	Reversibility	Resource Loss	Mitigation	Consequence	Significance
Alteration of the local hydrology	Low	Local	Permanent	Unlikely	High	Irreversible	Low	Yes	Low	Low
Loss of indigenous vegetation	Moderate	Local	Permanent	Definite	High	Irreversible	Moderate	Yes	Low	Low
Loss of faunal refugia	Low	Local	Permanent	Unlikely	Moderate	Irreversible	Low	Yes	Low	Low
Dust & ELP	Low	Local	Permanent	Likely	High	Reversible	Very low	Yes	Low	Low

The Terrestrial and Aquatic Biodiversity Specialist summarised the following in relation to the impacts of the proposed Access Road.

- The road route in question avoids areas identified as “sensitive” or of “significance” from an ecological perspective. As indicated by Figure 2 above, the road is to be positioned atop the crest of an elevated landform, away from scarp and riverine habitats.

- The xeric nature of the habitat as well as historical high density grazing of livestock, has given rise to sparse vegetation cover, particularly along the upper, level terrain within the site. It follows that the loss of vegetation within the road route is generally limited and that the route is of low botanical diversity.
- The rudimentary design of the roadway further limits the overall impact on the receiving environment.
- Hard panning along the road path is unlikely to result in significant storm water runoff issues as the site is considered to be a rain shadow desert with mean annual precipitation ranging between 40mm – 60mm. Normal engineering design parameters should however apply to the roadway.
- The tortoise (Testudinidae) *Chersina angulata* and the scorpion species *Parabuthus* spp are most likely to be affected along the proposed roadway. Their presence is however likely to be transitory. Reasonable efforts to relocate any encountered individuals off the pathway is advised when possible. Other recorded fauna in this area are likely to be located primarily within the riverine habitats, some distance away from the access road.

The specialist concluded that the proposed establishment and operation of the access road within the approved development footprint of the Grootfontein complex presents a very low, direct impact with minor cumulative impacts upon the receiving environment . It is clear that the proposed roadway is suitable for transformation based on the limited risk to the flora and fauna at this point.

HERITAGE IMPACTS.

Dr Jayson Orton of ASHA consulting undertook the full Heritage Impact Assessment for the Grootfontein Cluster of PV Facilities. Dr Orton furthermore prepared and submitted a NID specific to the proposed access road to Heritage Western Cape. Heritage Western Cape confirmed that there is no reason to believe that the proposed road on 149 REM & 149, Grootfontein, Ceres, will impact on heritage resources and that no further action under Section 38 of the National Heritage Resources Act (Act 25 of 1999) is required.

A copy of the original Heritage Impact Assessment, Access Road NID and Section 38 Approval from Heritage Western Cape is appended to this Basic Assessment Report.

VISUAL IMPACTS.

A Visual Impact Assessment was undertaken by Bernard Oberholzer (Landscape Architect / Environmental Planner) in association with Quinton Lawson (Architect) for the greater Grootfontein PV Cluster. Additional specialist input was also provided for this proposed Grootfontein Access Road.

The visual impact significance for the 3 Grootfontein PVs, and related infrastructure (including access roads) was rated as low risk, both before and after mitigation, for the construction, operation and decommissioning phases, in the original VIA of 2020. The visual specialist has confirmed that since proposed Grootfontein PV access road is almost entirely within the three authorised PV areas, the visual impact significance rating would remain at low risk.

The proposed access road would have a very limited viewshed (zone of visual influence), and is considered a minor visual element when seen in context with the larger solar PV project and overhead powerlines. Another consideration is that the landscape is relatively flat and no cut and fill earthworks are therefore envisaged. Cumulative visual impact significance would also be minimal for the same reasons.

The visual specialist identified the following potential impacts of the PV Facility and associated infrastructure (including access roads) which has been confirmed to remain unchanged.

Construction Phase:

- Impact 1: Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on residents and visitors to the area, particularly users of the main arterial route (R356), to the site.
- Impact 2: Potential visual effect of haul roads, access roads, stockpiles and construction camps in the exposed landscape.

Operational Phase:

- Impact 1: Potential visual intrusion of solar arrays and related infrastructure and the impact on receptors, including residents and visitors, as well as game farms in the area.
- Impact 2: Potential visual impact of an industrial type activity on the rural or wilderness character of the area.

Decommissioning Phase:

- Impact 1: Potential visual effect of any remaining structures, platforms and disused roads on the landscape.

Cumulative Impacts:

- Impact 1: Potential combined visual effect of the three solar PV facilities and associated infrastructure (i.e. Grootfontein PV development) with the similarly proposed Witte Wall and Hoek Doornen solar facilities in the study area, as well as with other nearby existing and proposed renewable energy farms in the area

The assessment of the significance of these impacts is included in the table below.

Table 2: Assessment of the Visual Impacts of the Proposed Grootfontein Access Road²².

Impact	Impact Criteria		Significance /Ranking (Pre-Mitigation)	Significance /Ranking (Post-Mitigation)	ConfidenceLevel
Impact 1 and Impact 2 for the construction	Status	Negative	Low risk	Low risk	High
	Spatial Extent	Local			
	Duration	Short Term			

²² This includes the assessment of the impacts associated with the PV facility with all associated infrastructure, for which the specialist confirms remains unchanged.

Impact	Impact Criteria		Significance /Ranking (Pre-Mitigation)	Significance /Ranking (Post-Mitigation)	ConfidenceLevel
	Consequence	Moderate			
	Probability	Very Likely			
	Reversibility	High			
	Irreplaceability	Low			
<i>Impact 1 and Impact 2 for the operational phase</i>	Status	Negative	Low risk	Low risk	High
	Spatial Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Very Likely			
	Reversibility	High			
	Irreplaceability	Low			
<i>Impact 1 for the decommissioning phase</i>	Status	Negative	Low risk	Very low risk	Medium
	Spatial Extent	Local			
	Duration	Long Term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Low			
<i>Cumulative Impact1 for the construction phase</i>	Status	Negative	Low risk	Low risk	High
	Spatial Extent	Local			
	Duration	Short Term			
	Consequence	Moderate			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Low			
<i>Cumulative Impact 1 for the operational phase</i>	Status	Negative	Moderate risk	Low risk	High
	Spatial Extent	Local			
	Duration	Long Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	High			

Impact	Impact Criteria		Significance /Ranking (Pre-Mitigation)	Significance /Ranking (Post-Mitigation)	ConfidenceLevel
	Irreplaceability	Low			
Cumulative Impact¹ for the decommissioning phase	Status	Negative	Moderate risk	Very low risk	Medium
	Spatial Extent	Local			
	Duration	Short Term			
	Consequence	Substantial			
	Probability	Likely			
	Reversibility	High			
	Irreplaceability	Low			

AVIFAUNAL IMPACTS

Mr Chris van Rooyen and Albert Froneman undertook an Avifaunal impact assessment of the Grootfontein PV Projects and associated infrastructure which included the three access roads that were authorised. Chris van Rooyen consulting was also asked to provide specialist input into the BA for this proposed access road. As part of this additional input, the specialist confirmed the following:

- The proposed access road will not change the nature or significance of any of the avifaunal impacts assessed in any significant manner.
- The proposed access road will not likely to result in any additional avifaunal impacts that were not previously assessed.
- No additional management outcomes or mitigation measures in terms of avifaunal impacts would be applicable to the proposed access road.

During the environmental process for the PV Facilities and associated infrastructure (which included the access roads) the following avifaunal impacts were assessed by the avifaunal specialist.

Construction Phase:

- Displacement due to disturbance associated with the construction of the solar PV plants and associated infrastructure.

Operational Phase:

- Displacement due to habitat transformation associated with the construction and operation of the solar PV plants and associated infrastructure;
- Collisions with the solar panels;

- Entrapment in perimeter fences; and
- Electrocutions on the internal 33kV power lines.

Decommissioning Phase:

- Displacement due to disturbance associated with the decommissioning of the solar PV plants and associated infrastructure.

Cumulative Impacts:

- Displacement due to disturbance associated with the construction of the solar PV plants and associated infrastructure;
- Displacement due to habitat transformation associated with the construction and operation of the solar PV plants and associated infrastructure;
- Collisions with the solar panels;
- Entrapment in perimeter fences;
- Electrocutions on the internal 33kV power lines; and
- Displacement due to disturbance associated with the decommissioning of the solar PV plants and associated infrastructure

As can be seen, the displacement of specie as a result of disturbance and habitat transformation is the only impact related to the proposed Grootfontein Access Road as included in the table below.

Table 3: Assessment of the Avifaunal Impacts of the Proposed Grootfontein Access Road³³.

Impact	Impact Criteria		Significance /Ranking (Pre-Mitigation)	Significance /Ranking (Post-Mitigation)	ConfidenceLevel
<i>Displacement due to disturbance associated with the construction and decommissioning of the solar PV plants and <u>associated infrastructure</u></i>	<i>Status</i>	Negative	Moderate risk	Low risk	High
	<i>Spatial Extent</i>	Site specific			
	<i>Duration</i>	Short term			
	<i>Consequence</i>	Substantial			
	<i>Probability</i>	Very likely			
	<i>Reversibility</i>	High			
	<i>Irreplaceability</i>	Low			

³³ This includes the assessment of the relevant impacts associated with the PV facility with all associated infrastructure, for which the specialist confirms remains unchanged.

Impact	Impact Criteria		Significance /Ranking (Pre-Mitigation)	Significance /Ranking (Post-Mitigation)	ConfidenceLevel
<i>Displacement of avifauna due to habitat transformation associated with the presence of the solar PV plants and <u>associated infrastructure</u>.</i>	<i>Status</i>	Negative	High risk	Moderate risk	Medium
	<i>Spatial Extent</i>	Site specific			
	<i>Duration</i>	Long term			
	<i>Consequence</i>	Severe			
	<i>Probability</i>	Very likely			
	<i>Reversibility</i>	High			
	<i>Irreplaceability</i>	Low			

SOCIO ECONOMIC IMPACTS

The potential social impacts of the proposed access road are insignificant and cannot be considered in isolation of the authorised PV Facilities in which it serves.

The Socio-Economic Assessment for the Grootfontein PV facility and associated infrastructure was undertaken by a Social Specialist, Ms Sandra Hill.

The following Socio Economic Impacts were identified by the social specialist for the proposed Grootfontein PV projects and associated infrastructure.

Construction Phase:

- Disruption of local social structures.
- Increased social ills and risky behaviours.
- Increased burden on existing social and bulk services.
- Increased road use and road traffic related accidents and/or damage.
- Unrealistic expectations regarding local job creation.
- Creation of temporary employment.
- Increased household income attainment and standard of living.
- Potential increase in crime.

- Potential decrease in local eco-tourism.
- Potential marginalisation of local residents.
- Development and/or growth of locally-owned support industries

Operational Phase:

- Creation of long-term employment
- Development and/or growth of locally-owned industries
- Human development via the EDP

Decommissioning Phase:

- Job losses
- Local economy stimulation

Cumulative Impacts:

- Exacerbated in-migration of job seekers
- Combined impact of multiple EDPs

Table 4: Assessment of the Socio Economic Impacts of the Proposed Grootfontein PV projects and associated infrastructure including access road.

<i>Impact</i>	<i>Impact Criteria</i>		<i>Significance / Ranking (Pre-Mitigation and Pre-Enhancement)</i>	<i>Phase</i>	<i>Significance / Ranking(Post-Mitigation and Post-Enhancement)</i>	<i>Confidence Level</i>
Disruption of local social structures	Status	Negative	Low	Construction Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Medium term				
	Consequence	Moderate				
	Probability	Likely				
	Irreplaceability	Moderate				
Increased social ills and risky behaviors	Status	Negative	Moderate	Construction Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Medium term				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
	<i>Consequence</i>	Substantial				
	<i>Probability</i>	Likely		Construction Phase		
	<i>Reversibility</i>	Low				
	<i>Irreplaceability</i>	N/A				
Increased burden on existing social and bulk services	<i>Status</i>	Negative	Low	Construction Phase	Low	Medium
	<i>Spatial Extent</i>	Local				
	<i>Duration</i>	Short to medium term				
	<i>Consequence</i>	Moderate				
	<i>Probability</i>	Likely				
	<i>Reversibility</i>	Moderate				
	<i>Irreplaceability</i>	N/A				
Increased road use and road traffic related accidents and/or damage	<i>Status</i>	Negative	Low	Construction Phase	Low	Medium
	<i>Spatial Extent</i>	Local				
	<i>Duration</i>	Short to medium term				
	<i>Consequence</i>	Moderate				
	<i>Probability</i>	Likely				
	<i>Reversibility</i>	High				
	<i>Irreplaceability</i>	N/A				
	<i>Spatial Extent</i>	Local				
	<i>Duration</i>	Long term				
	<i>Consequence</i>	Moderate				
	<i>Probability</i>	Very likely				
	<i>Reversibility</i>	High				
	<i>Irreplaceability</i>	N/A				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
Unrealistic expectations regarding local job creation	Status	Negative	Low	Construction Phase	Very low	Medium
	Spatial Extent	Local				
	Duration	Medium to long term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	N/A				
Creation of temporary employment	Status	Positive	Moderate	Construction Phase	Moderate	Medium
	Spatial Extent	Local and Regional				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	N/A				
Increased household income attainment and standard of living	Status	Positive	Moderate	Construction Phase	Moderate	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	N/A				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
Potential increase in crime	Status	Negative	Moderate	Construction Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Medium				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	N/A				
Potential decrease in local tourism	Status	Negative	Low	Construction Phase	Very low	Medium
	Spatial Extent	local				
	Duration	Short to medium term				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	High				
	Irreplaceability	N/A				
Potential marginalisation of local residents	Status	Negative	Low	Construction Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Permanent				
	Consequence	Moderate				
	Probability	Likely				
	Reversibility	Low				
	Irreplaceability	N/A				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
Development and/orgrowth of locally-owned industries	Status	Positive	Low	Construction Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	High				
	Irreplaceability	N/A				
Creation of long-term employment	Status	Positive	Very low	Operational Phase	Very low	Medium
	Spatial Extent	Local and Regional				
	Duration	Long term				
	Consequence	Slight				
	Probability	Very unlikely				
	Reversibility	High				
	Irreplaceability	N/A				
Development and/orgrowth of locally-owned industries	Status	Positive	Very low	Operational Phase	Very low	Medium
	Spatial Extent	Local				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
	Duration	Long term				
	Consequence	Slight				
	Probability	Very unlikely				
	Reversibility	N/A				
	Irreplaceability	N/A				
Human development via the EDP	Status	Positive	Moderate	Operational Phase	High	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Moderate				
	Irreplaceability	N/A				
Job losses	Status	Negative	Low	Decommissioning Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Long term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	N/A				

Impact	Impact Criteria		Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Phase	Significance / Ranking (Post-Mitigation and Post-Enhancement)	Confidence Level
	Irreplaceability	N/A				
Local economystimulation	Status	Positive	Low	Decommissioning Phase	Low	Medium
	Spatial Extent	Local				
	Duration	Short term				
	Consequence	Moderate				
	Probability	Very likely				
	Reversibility	N/A				
	Irreplaceability	N/A				