FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape

FEBRUARY 2021

Prepared for:
Veroniva (Pty) Ltd

VERONIVA
Renewable Energy Development

Prepared by:
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South Africa

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BASIC ASSESSMENT PROCESS

for the

Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape

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February 2021

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REPORT DETAILS

Title:	Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape: FINAL BASIC ASSESSMENT (BA) REPORT
Purpose of this report:	The purpose of this Final BA Report is to: ▪ Present the details of and the need for the proposed project; ▪ Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; ▪ Provide an overview of the BA Process followed, including public consultation; ▪ Assess the potential positive and negative impacts of the proposed project on the environment; ▪ Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the project; and ▪ Provide an Environmental Management Programme (EMPr) for the proposed project. The Draft BA Report was made available to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from 3 December 2020 to 25 January 2021. All comments submitted during the 30-day review have been incorporated in a detailed Comments and Responses Report, and addressed, as applicable and where relevant, into the Final BA Report. This Final BA Report has been submitted to the National Department of Environment, Forestry and Fisheries (DEFF) for decision-making.
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KEY CHANGES MADE FROM THE DRAFT BA REPORT THAT WAS ISSUED FOR I&AP, STAKEHOLDER AND ORGAN OF STATE REVIEW FROM 3 DECEMBER 2020 TO 25 JANUARY 2021

Section of Report	Key Change
BA Report and Appendices	• The term "BA Report" has been updated to "Final BA Report", where applicable. • Changed "Tankwa Karoo" and "Tanqua Karoo" to "Ceres Karoo" throughout, where applicable. • Changed references of the "Ceres Tankwa Karoo Farmers Union" to "Ceres-Tankwa Karoo Farmers Association".
BA Report – Section A	• Updated Section A (5) with additional information regarding the upgrading of the existing access roads. • Updated Section A (6) with additional information on typical maintenance processes. • Updated Section A (7) with amended traffic volumes in terms of the number of vehicles. This has resulted in more or less the same number of trips reported in the Draft BA Report (hence not a significant change). • Updated Section A (5), Section A (9) and Section A (14) with additional information on water use and use of existing boreholes. • Updated Section A (11) with a description of listed activities included in the Draft BA Report that are no longer applicable and the associated reasoning. An amended application form has been submitted to the DEFF. • Updated Section A (14) with additional information on cumulative impacts.
BA Report – Section B	• Updated Section B with some new maps to show the reduced area for Hoek Doornen PV 3 (which is not a significant change), more detail and updates on the distances from the proposed project to the Sadawa farmstead and farm boundary, additional feedback on the Doornrivier farmsteads (which are not affected by the proposed project), and additional feedback on eco-tourism activities and potential impact on bats.
BA Report – Section C	• Updated with additional information regarding the status and progress made on the BA Reports, the submission of the Application for Environmental Authorisation to the DEFF, as well as DEFF's acknowledgment of receipt of the BA Reports, and the assignment of reference numbers for the BA projects. • Updated with details of the Public Participation Process undertaken thus far. • Updated with new comments received during the review of the Draft BA Reports and provided a summary of responses to these comments raised. • Updated with a description of feedback received from the Heritage Western Cape (HWC).
BA Report – Section D	• Updated Section D.1 will additional information on the process flow for the assessment of cumulative impacts. • Updated Section D.2 with additional mitigation measures based on the comments/recommendations received from I&APs, Stakeholders and Organs of State during the review of the Draft BA Report. This includes additional feedback on the impact of road conditions on agriculture, clarification on the recommendations for safety and security, more detail on the requirements for the Economic Development Plan, more detail on the use of existing boreholes, and clarification between the internal and external public and private roads needing maintenance. • Updated Section D.2 with additional feature-sensitivity maps requested by the DEFF, as well as updates to the Visual Sensitivity map (based on a larger scale) to show the additional sensitivities assigned to the Doornriver Farmsteads and 500 m from the Sadawa Farm border (more details are provided in the Hoek Doornen PV BA Report).
BA Report – Section E	• Updated with recommended compliance monitoring and reporting frequency. • Updated recommendations relating to socio-economic and traffic, as described above.
Appendix A	• Updated to include the updated combined sensitivity map (based on visual updates).
Appendix C	• There have been no major changes to the specialist assessments. The specialists have added a summary of comments received during the 30-day comment period, where relevant. In addition, minor map changes have been made to reflect the reduced area for Hoek Doornen PV 3 (where applicable and possible). • The Agriculture Compliance Statement (Appendix C.1) has been updated to include additional feedback on the impact of road conditions on agriculture. • The Visual Impact Assessment (Appendix C.2) has been updated with more detail on the distances from the proposed project to the Sadawa farmstead and farm boundary, and the Doornrivier farmsteads have been added to the maps (which are not affected by the proposed project). More details are provided in the Hoek Doornen PV BA Report. • The Avifauna Assessment (Appendix C.6) has been updated to include more detail on

Section of Report	Key Change
	avifaunal monitoring and reporting programmes. • The Socio-Economic Assessment (Appendix C.7) has been updated with clarifications on the recommendations for safety and security, and more detail on the requirements for the Economic Development Plan. • The Geohydrology Assessment (Appendix C.8) has been updated to clarify that additional boreholes are not foreseen, as well as in principle agreement from the landowners.
Appendix D	• Updated with proof of placement of newspaper advertisements for the release of the Draft BA Reports for comment (Appendix D.5). • Added Appendix D.11 (Submission of the Heritage Impact Assessment to Heritage Western Cape (HWC) for Decision-Making and Acknowledgement of Receipt); Appendix D.12 (Approval of the Heritage Impact Assessment by HWC); Appendix D.13 (Copies and Proof of Correspondence Sent to Stakeholders for the Release of the Draft BA Report for Comment); Appendix D.14 (Comments received from Stakeholders during the 30-day review of the Draft BA Report); and Appendix D.15 (Comments and Responses Trail). • Updated the database of I&APs, Stakeholders and Organs of State to reflect stages of consultation, commenting, as well as additions to the database (Appendix D.6).
Appendix G and Appendix H	• Updated with additional mitigation measures based on the comments/recommendations received from I&APs, Stakeholders and Organs of State during the review of the BA Report. This includes clarification on the recommendations for safety and security, more detail on the requirements for the Economic Development Plan, clarification between the internal and external public and private roads needing maintenance, and various other best practice measures for monitoring of bird collisions, the protection of water resources, management of pollution, water conservation measures and requirements for emergency incidents. • Updated to include the updated combined sensitivity map (based on visual updates).
Appendix J	• Updated with amended traffic volumes in terms of the number of vehicles. This has resulted in more or less the same number of trips reported in the Draft BA Report (hence not a significant change). • Updated with requirements from the Western Cape Department of Roads.

Note from the CSIR: If sections are not mentioned in the above table, this means that either there have been no changes or no major changes to these sections.

EXECUTIVE SUMMARY

INTRODUCTION

The Project Developer, Veroniva (PTY) Ltd, is proposing to develop nine 175 MW (9 X 175 MW) Solar Photovoltaic (PV) power generation facilities and associated infrastructure, north-east of Ceres and north of Touws River, in the Western Cape Province. The associated infrastructure includes various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, nine 132 kV power lines, nine on-site substations, and nine Lithium Ion Battery Energy Storage Systems (BESS). The proposed nine Solar PV facilities will connect to the national grid at the existing Eskom Kappa Substation. The proposed projects are located within the Witzenberg Local Municipality, which falls within the Cape Winelands District Municipality, and are situated approximately 90 km from Ceres and 70 km from Touws River. The locality map is provided in Figure A. Each proposed project will be developed by a separate Project Applicant. The Project Names, Project Applicants, and respective farm portions affected by the proposed PV facilities, EGI and associated infrastructure are shown in Table A below. **This report only covers the proposed EGI to support all nine PV Facilities. Separate reports have been compiled for the PV projects.**

Table A. Project Names, Applicants and main Affected Farm Portions

Project Name	Project Applicant	Affected Farm Portions (PV Facility and Associated Infrastructure)	Affected Farm Portions (Power Lines)
Witte Wall PV 1	Witte Wall PV 1 (PTY) LTD	▪ Witte Wall RE/171	▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Witte Wall PV 2	Witte Wall PV 2 (PTY) LTD		
Grootfontein PV 1	Grootfontein PV 1 (PTY) LTD	▪ Grootfontein RE/149 ▪ Grootfontein 5/149	▪ Grootfontein RE/149 ▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Grootfontein PV 2	Grootfontein PV 2 (PTY) LTD		
Grootfontein PV 3	Grootfontein PV 3 (PTY) LTD		
Hoek Doornen PV 1	Hoek Doornen PV 1 (PTY) LTD	▪ Hoek Doornen 1/172	▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Hoek Doornen PV 2	Hoek Doornen PV 2 (PTY) LTD		
Hoek Doornen PV 3	Hoek Doornen PV 3 (PTY) LTD		
Hoek Doornen PV 4	Hoek Doornen PV 4 (PTY) LTD		

The proposed projects are located entirely within the Komsberg Renewable Energy Development Zone (REDZ 2), one of the eight REDZs formally gazetted in South Africa for the purpose of developing solar and wind energy generation facilities (Government Notice (GN) 114; 16 February 2018). In line with the gazetted process for projects located within a REDZ, the proposed projects are subject to a Basic Assessment (BA) process instead of a full Scoping and Environmental Impact Assessment (EIA) process and a reduced decision making period of 57 days, in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772; in GN R326, R327, R325 and R324 on 7 April 2017. A BA Process in terms of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) has therefore been undertaken for the proposed projects. The Competent Authority for the proposed projects is the National Department of Environment, Forestry and Fisheries (DEFF).

Approval has been granted by the DEFF to submit combined Applications for Environmental Authorisation (EA) in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and the issuing of multiple EAs (should they be granted) in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended). Therefore, four separate BA Reports have been compiled, as indicated in Table B below, and it is proposed that nine separate EAs will be issued for each PV Facility and associated infrastructure, as well as nine separate EAs for the power lines and associated EGI that are required to support the nine PV Facilities (should they be granted):

Table B. BA Reporting Structure and Components

	Report 1: Witte Wall Farm	**Report 2: Grootfontein Farm**	**Report 3: Hoek Doornen Farm**	**Report 4: EGI (i.e. this report)**
BA Reports	**Group 1**: Witte Wall Farm: 1 BA Report that covers the 2 PV Facilities (i.e. Witte Wall PV 1 and PV 2), 2 on-site substations, 2 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations)	**Group 2**: Grootfontein Farm: 1 BA Report that covers the 3 PV Facilities (i.e. Grootfontein PV 1, PV 2 and PV 3), 3 on-site substations, 3 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations)	**Group 3**: Hoek Doornen Farm: 1 BA Report that covers the 4 PV Facilities (i.e. Hoek Doornen PV 1, PV 2, PV 3 and PV 4), 4 on-site substations, 4 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations)	**Group 4**: EGI to support the PV Facilities: 1 BA Report that covers all the power lines and associated EGI that are required to support the 9 PV Facilities (i.e. 9 Power Lines and the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section) of the proposed on-site substations up to the line bay at the Eskom Kappa Substation)

Combined Applications for EA were submitted to the DEFF together with the Draft BA Reports in December 2020.

As explained above, this Final BA Report only deals with the proposed **EGI to support the nine proposed PV Facilities (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4)**.

An integrated Public Participation Process was undertaken for the proposed projects.

The Draft BA Report was released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period, extending from 3 December 2020 to 25 January 2021. All comments submitted during the 30-day review have been incorporated into a detailed Comments and Responses Report, and addressed, as applicable and where relevant, into this Final BA Report. The Final BA Report has been submitted to the DEFF, in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20, however with a reduced 57-day timeframe (as the proposed projects fall within the REDZ 2, as explained above).

PROJECT LOCATION

The locality of the nine proposed PV projects, EGI, including the associated infrastructure, is shown below in Figure A. The co-ordinates of the proposed project sites are detailed in Section A of the Final BA Report.

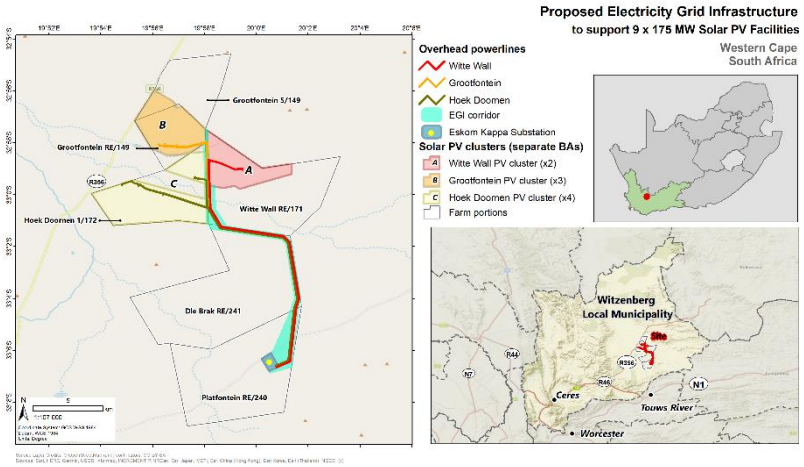


Figure A: Locality Map of the nine proposed PV Projects (subject of separate BA Processes) and the EGI

PROJECT BASIC ASSESSMENT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Developer has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the required BA Processes in order to determine the biophysical, social and economic impacts associated with undertaking the proposed development. The project team, including the relevant specialists, is indicated in Table C below.

Table C. Project Team for the EGI BA Process

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (*Registered EAP (2019/745)*)	CSIR	EAP and Project Leader
Rohaida Abed (*Pr.Sci.Nat.*)	CSIR	Project Manager
Dhiveshni Moodley (*Cand.Sci.Nat.*)	CSIR	Project Officer
Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Project Mapping
Lizande Kellerman (*Pr.Sci.Nat.*)	CSIR	Project Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.*)	Private	Agricultural Compliance Statement
Quinton Lawson	Quinton Lawson Architect (QARC)	Visual Impact Assessment
Bernard Oberholzer	Bernard Oberholzer Landscape Architect (BOLA)	
Dr. Jayson Orton	ASHA Consulting	Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology)
Dr. John Almond	Natura Viva cc	
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Terrestrial Biodiversity and Species Impact Assessment
Simon Todd (*Pr.Sci.Nat.*)	3Foxes Biodiversity Solutions	Riverine Rabbit
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Aquatic Biodiversity and Species Impact Assessment
Chris van Rooyen and Albert Froneman (*Pr.Sci.Nat.*)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Sandra Hill	Private	Socio-Economic Impact Assessment
Charl Muller and Julian Conrad	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment

Name	Organisation	Role/ Specialist Study
Lizande Kellerman (*Pr.Sci.Nat.*), Rohaida Abed (*Pr.Sci.Nat.*), Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Civil Aviation Site Sensitivity Verification
Technical Input		
Annebet Krige *Pr Eng*	Sturgeon Consulting	Traffic Impact Statement

PROJECT DESCRIPTION

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EAs, should they be granted for the proposed projects). As noted above, three separate BA Reports have been compiled for the nine proposed PV Facilities. This BA Report only addresses the power lines and associated EGI required to support the PV Facilities and to enable connection to the Eskom Kappa Substation.

The proposed projects will make use of PV technology to generate electricity from solar energy and transmit it to the National Grid. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate and transmit electricity for a minimum period of 20 years. The construction phase for each proposed project is expected to extend 12 to 14 months. The proposed projects will consist of the following components:

- Nine 132 kV overhead power lines to connect to the existing Eskom Kappa Substation located within a corridor of approximately 300 m wide;
- Service road of approximately 4 m wide below the power lines;
- Game fences along the power line routes to fence off the servitudes across the farm Witte Wall. Suitable fencing will be placed along the power line corridor on Die Brak;
- Nine on-site substations and/or a switching substations (the relevant section that will be transferred from the Independent Power Producer); and
- Associated electrical infrastructure at the Eskom Kappa Substation (including but not limited to feeders, Busbars, new transformer bay (up to 500 MVA) and extension to the platform at the Eskom Kappa Substation).

NEED FOR THE BA

As noted above, in terms of the 2014 NEMA EIA Regulations (as amended) published in GN R326, R327, R325 and R324, as well as GN 114 for procedures within a REDZs, a BA Process is required for the proposed projects. The need for the BA is triggered by, amongst others, the inclusion of Activity 11 listed in GN R327 (Listing Notice 1):

- *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts".*

Section A of this Final BA Report contains the detailed list of activities contained in GN R327, R325 and R324 which are triggered by the various project components and thus form part of this BA Process.

The purpose of the BA is to identify, assess and report on any potential impacts relating to the proposed project, if implemented, may have on the receiving environment. The BA therefore needs to show the Competent Authority, the DEFF; and the project proponent, Veroniva (PTY) Ltd, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

IMPACT ASSESSMENT

As indicated in Table C above, a total of eight specialist studies were undertaken as part of the BA Process. One site sensitivity verification assessment was undertaken for Civil Aviation, and a technical input report on traffic

was also conducted. The full specialist studies are provided in Appendix C of this Final BA Report. Section B of this report provides a summary of the affected environment associated with these studies; and Section D provides a summary of the impact assessments conducted by the specialists. A summary of the specialist studies is outlined below.

Agriculture

The Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statement is included in Appendix C.1 of the BA report.

The Agriculture Compliance Statement identified the loss of agricultural land use and soil degradation as potential impacts on agriculture. However, the EGI has negligible agricultural impact in this study area for the two reasons:

- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in the project area (grazing) can continue completely unhindered underneath transmission lines.
- The direct, permanent, physical footprint of the EGI that has any potential to interfere with agriculture is restricted to pylon bases and substation footprints that, in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the proposed development be approved.

Visual Impact Assessment

The Visual Impact Assessment was undertaken by Quinton Lawson and Bernard Oberholzer to inform the outcome of this BA from a visual perspective. The complete Visual Impact Assessment is included in Appendix C.2 of the BA Report.

The potential visual impacts resulting from the proposed projects on landscape features and receptors are listed below for each of the project phases, including cumulative impacts. No indirect impacts have been identified.

The table below includes an assessment of the potential direct impacts identified for the proposed project for the construction, operational and decommissioning phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
▪ Potential effect of dust and noise from construction machinery during the construction of the substation and pylons, and the effect of this on residents and visitors to the area. ▪ Potential visual effect of access roads, stockpiles and construction camps in	**Low risk (Level 4)**	**Low risk (Level 4)**

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
the exposed landscape.		
DIRECT IMPACTS – OPERATIONAL PHASE		
▪ Potential visual intrusion of substations and power lines, and the impact on receptors, particularly where power lines cross roads. ▪ Potential visual impact of industrial type activities on the rural or wilderness character of the area.	**Low risk (Level 4)**	**Low risk (Level 4)**
DIRECT IMPACTS - DECOMMISSIONING PHASE		
▪ Potential visual effect of any remaining electrical grid structures and disused roads on the landscape	**Low risk (Level 4)**	**Very low risk (Level 5)**

The table below includes an assessment of the potential cumulative impacts identified for the proposed project for the construction, operational and decommissioning phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
CUMULATIVE IMPACTS - CONSTRUCTION PHASE		
▪ Potential combined visual effect of the nine Solar PV Facilities, nine power lines, as well as the nearby existing Perdekraal WEF. This would potentially result in the visual effect of nine connecting power lines to the Eskom Kappa substation.	**Moderate risk (Level 3)**	**Low risk (Level 4)**
CUMULATIVE IMPACTS - OPERATIONAL PHASE		
▪ Potential combined visual effect of the nine Solar PV Facilities, nine power lines, as well as the nearby existing Perdekraal WEF. This would potentially result in the visual effect of nine connecting power lines to the Eskom Kappa substation.	**Moderate risk (Level 3)**	**Low risk (Level 4)**
CUMULATIVE IMPACTS - DECOMMISSIONING PHASE		
▪ Potential combined visual effect of the nine Solar PV Facilities, nine power lines, as well as the nearby existing Perdekraal WEF. This would potentially result in the visual effect of nine connecting power lines to the Eskom Kappa substation.	**Moderate risk (Level 3)**	**Very low risk (Level 5)**

Overall, the Visual Impact Assessment concluded that there are no fatal flaws from a visual perspective arising from the proposed projects, and given the marginal nature of agriculture in the area, the solar energy project is probably an inherently suitable land use that should receive authorisation, provided the mitigation measures are implemented as a condition of approval.

Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by Dr. Jayson Orton of ASHA Consulting to inform the outcome of this BA from an archaeology and cultural landscape perspective. An integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of Heritage Western Cape (HWC). However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete Heritage Impact Assessment is included in Appendix C.3 of the BA Report.

The potential impacts identified in the Heritage Impact Assessment include direct and cumulative impacts during the construction, operational and decommissioning phases. No indirect impacts are anticipated. The impacts identified are listed below.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Potential impacts to archaeological resources and graves	**Low risk (Level 4)**	**Very low risk (Level 5)**
• Potential impacts to the cultural landscape	**Moderate risk (Level 3)**	**Low risk (Level 4)**
DIRECT IMPACTS - OPERATIONAL PHASE		
• Potential impacts to the cultural landscape	**Low risk (Level 4)**	**Low risk (Level 4)**
DIRECT IMPACTS - DECOMMISSIONING PHASE		
• Potential impacts to the cultural landscape	**Moderate (Level 3)**	**Low (Level 4)**
CUMULATIVE IMPACTS – CONSTRUCTION; OPERATIONAL AND DECOMMISSIONING PHASES		
• Cumulative impacts to all heritage resources	**Moderate (Level 3)**	**Moderate (Level 3)**

The Heritage Impact Assessment concluded that there are no significant impacts to culturally significant heritage resources anticipated and impacts of low significance can be easily managed or mitigated. It was recommended that the proposed projects should be authorised in full.

Heritage Impact Assessment (Palaeontology)

The Palaeontology Impact Assessment was undertaken by Dr. John Almond of Natura Viva to inform the outcome of this BA from a palaeontological perspective. The Palaeontology Impact Assessment is included as an appendix to the Heritage Impact Assessment, which is included in Appendix C.3 of the BA Report.

The key impacts on local palaeontological heritage resources identified are direct and relate to the potential disturbance, damage, destruction or sealing-in of scientifically-important and legally-protected fossils preserved at or beneath the surface of the ground due to construction phase excavations, and ground clearance. The impacts identified only apply to the construction phase of the proposed developments since further significant impacts on fossil heritage during the planning, operational and decommissioning phases of the facilities are not anticipated. Cumulative impacts are also identified, as indicated below.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	**Very low risk (Level 5)**	**Very low risk (Level 5)**
CUMULATIVE IMPACTS - CONSTRUCTION PHASE		
• Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	**Low risk (Level 4)**	**Very low risk (Level 5)**

As a consequence of (1) the paucity of irreplaceable, unique or rare fossil remains within the development footprint, as well as (2) the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks within the solar PV facility project areas, the overall impact significance of the construction phase of the proposed solar PV facilities regarding legally-protected palaeontological heritage resources is assessed as **very low** (negative status), with and without mitigation.

In terms of cumulative impacts, it is concluded that as far as fossil heritage resources are concerned, the proposed solar facility projects, whether considered individually or together, will not result in an unacceptable loss or unacceptable additional impacts, considering all the renewable energy projects proposed in the area. This analysis only applies provided that all the proposed monitoring and mitigation recommendations made for all these various projects are consistently and fully implemented.

There are no identified fatal flaws and no objections on palaeontological heritage grounds to authorisation of the proposed solar PV facilities.

Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity and Species Assessment was undertaken by Simon Bundy, Luke Maingard, and Alex Whitehead of Sustainable Development Projects cc to inform the outcome of this BA from a terrestrial biodiversity and species perspective. The complete Terrestrial Biodiversity and Species Assessment is included in Appendix C.4 of the BA Report.

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. These impacts are noted below.

Construction Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)	
• Impact 1: Alteration of habitat structure and composition	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 2: Ousting (and recruitment) of various fauna	**High risk (Level 2)**	**Moderate risk (Level 3)**	
• Impact 3: Changes in the geomorphological state of drainage patterns	**High risk (Level 2)**	**Moderate risk (Level 3)**	**Low risk (Level 4)**
• Impact 4: Increased ELP	**Low risk (Level 4)**	**Low risk (Level 4)**	
• Impact 5: Exclusion or entrapment of (in particular) large fauna	**Low risk (Level 4)**	**Low risk (Level 4)**	
• Impact 6: Changes in edaphics (soils) due to excavation and import of soils, leading to the alteration of plant communities and fossorial species in and around these points	**Low risk (Level 4)**	**Low risk (Level 4)**	
• Impact 7: Changes in subsurface water resources arising from alteration of percolation and recharge at points	**Low risk (Level 4)**	**Low risk (Level 4)**	
• Impact 8: Changes in water resources and surface water in terms of water quality	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 9: Exotic weed invasion	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 10: Clearance of vegetation to establish roadways and other infrastructure	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 11: Dust – according to movement of traffic and other construction related factors will affect factors such as palatability of vegetation	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 12: Incidental pollution events, including the loss of solid waste, spillage of liquids such as hydrocarbons and other fuels as well as possible sewerage and other waste is likely to alter select points within the subject site, possibly affecting habitat form and other factors.	**Moderate risk (Level 3)**	**Low risk (Level 4)**	
• Impact 13: General disturbance on account of pedestrian movement and activities on site	**Moderate risk (Level 3)**	**Low risk (Level 4)**	

Operational Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 14: Continued alteration of habitat structure and composition on account of continuing low level anthropogenic impacts, such as “shading of vegetation” from arrays	**Moderate risk (Level 3)**	**Low risk (Level 4)**

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 15: Ousting (and recruitment) of various fauna on account of long-term changes in the surrounding habitat/environment	**Moderate risk (Level 3)**	**Low risk (Level 4)**
• Impact 16: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 17: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 18: Exotic weed invasion as a consequence of regular and continued disturbance of site	**Low risk (Level 4)**	**Low risk (Level 4)**

Decommissioning Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 19: A reversion to an early seral stage	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 20: A reversion to present faunal population states within the study area, with some variation to these populations being possible	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 21: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 22: Exotic weed invasion as a consequence of abandonment of site and cessation of weed control measures	**Low risk (Level 4)**	**Low risk (Level 4)**

Operational Phase - Indirect Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 23: Changes in the broader landscape ecology through alteration of eco-morphological drivers	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 24: Changes in faunal ethos due to the establishment of the PV Facilities	**Low risk (Level 4)**	**Low risk (Level 4)**

Construction and Operational Phases – Cumulative Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 25: Alteration of habitat structure and composition, albeit primarily sporadic in nature, over an extensive and wide area	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 26: Changes in fauna, faunal ethos and related factors	**Moderate risk (Level 3)**	**Low risk (Level 4)**
• Impact 27: Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 28: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 29: Exotic weed invasion as a consequence of regular and continued disturbance across an extensive area of site	**Low risk (Level 4)**	**Low risk (Level 4)**

The overall impact significance (with the implementation of mitigation measures) associated with the PV facilities is rated as moderate during the construction phase, and low during the operational and decommissioning phases for direct impacts. The same trend applies to the cumulative and indirect impacts.

Given the information presented above it is recommended that the proposed projects are permitted to proceed, and that it has a limited impact on the broader ecological processes and those areas deemed to be of ecological significance (namely the lower riparian environments and sand wash environments). Therefore, the proposed projects show a low level ecological impact within the sites identified and, subject to the implementation of the prescribed management recommendations and conditions, should not be precluded from development on ecological grounds.

Aquatic Biodiversity and Species Impact Assessment

The Aquatic Biodiversity and Species Assessment was undertaken by Simon Bundy, Luke Maingard, and Alex Whitehead of Sustainable Development Projects cc to inform the outcome of this BA from an aquatic biodiversity and species perspective. The complete Aquatic Biodiversity and Species Assessment is included in Appendix C.5 of the BA Report.

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. These impacts are noted below.

Construction Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 1: Changes in the geomorphological state of drainage patterns	**High risk (Level 2)**	**Moderate risk (Level 3)**
• Impact 2: Increased ELP	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 3: Changes in water resources and surface water in terms of water quality	**Moderate risk (Level 3)**	**Low risk (Level 4)**

Operational Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 4: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 5: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities	**Low risk (Level 4)**	**Low risk (Level 4)**

Decommissioning Phase – Direct Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 6: A reversion to present faunal population states within the study area, with some variation to these populations being possible	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 7: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment	**Low risk (Level 4)**	**Low risk (Level 4)**

Construction and Operational Phases - Indirect Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 8: Changes in the broader landscape ecology through alteration of eco-morphological drivers	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 9: Changes in faunal ethos due to the establishment of the PV Facilities	**Low risk (Level 4)**	**Low risk (Level 4)**

Construction and Operational Phases – Cumulative Impacts

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
• Impact 10: Increased change in the geomorphological state of drainage lines and watercourses, on account of long term and extensive change in the nature of the catchment	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 11: Changes in water resources and surface water in terms of water quality on account of extensive changes in the catchment.	**Low risk (Level 4)**	**Low risk (Level 4)**

The overall impact significance (with the implementation of mitigation measures) associated with the PV facilities is rated as low during the construction phase, operational and decommissioning phases for direct impacts. The same trend applies to the cumulative and indirect impacts.

Given the information presented above it is recommended that the proposed projects are permitted to proceed, and that it has a limited impact on the broader ecological processes and those areas deemed to be of ecological significance (namely the lower riparian environments and sand wash environments). Therefore, the proposed projects show a low level aquatic ecological impact on adjacent riparian environments and, subject to the implementation of the prescribed management recommendations and conditions, should not be precluded from development on ecological grounds.

Riverine Rabbit Assessment

The Riverine Rabbit Assessment was undertaken by Simon Todd of 3Foxes Biodiversity Solutions to inform the outcome of this BA from a faunal perspective, with particular reference to Riverine Rabbit. The complete Riverine Rabbit Assessment is included in Appendix F of the Terrestrial Biodiversity and Species Assessment, which is included as Appendix C.4 of the BA Report.

The following impacts were identified for the construction and operational phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT AND INDIRECT IMPACTS - CONSTRUCTION PHASE		
• Impact on Riverine Rabbits due to construction phase activities (i.e. Habitat loss and disturbance)	**Moderate risk (Level 3)**	**Low risk (Level 4)**
DIRECT IMPACTS - OPERATIONAL PHASE		
• Impact on Riverine Rabbits due to operational phase activities (i.e. Disturbance and vehicle collisions)	**Low risk (Level 4)**	**Low risk (Level 4)**
CUMULATIVE IMPACTS - OPERATIONAL PHASE		
• Cumulative Impacts on Broad-Scale Ecological Processes as related to the Riverine Rabbit (Disturbance and vehicle collisions)	**Moderate risk (Level 3)**	**Low risk (Level 4)**

A 6-week camera trapping exercise was undertaken that did not capture any images of Riverine Rabbits, suggesting at the very least that this species is not common in the area. Based on the field assessment and assessed layout of the proposed PV facilities, the development would not generate significant impact on the

Riverine Rabbit and with the provided buffers around the important habitat features, the loss of habitat and impacts on landscape connectivity for Rabbits would be low.

Under the layout of the PV facilities as assessed, there are no impacts on Riverine Rabbits that are moderate or high after mitigation and as a result, the development of the proposed PV facilities is considered acceptable. Overall, there are no fatal flaws associated with any of the proposed PV facilities and it can be supported in terms of generating acceptably low Riverine Rabbit impacts.

Avifauna Assessment

The Avifauna Impact Assessment was undertaken by Chris van Rooyen and Albert Froneman of Chris van Rooyen Consulting to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessment is included in Appendix C.6 of the BA Report. The following direct and cumulative impacts for the operational phase were identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Collision mortality of priority species due to the 132 kV grid connections	High risk (Level 2)	Moderate risk (Level 3)
CUMULATIVE IMPACTS – OPERATIONAL PHASE		
• Collision mortality of priority species due to the 132 kV grid connections	High risk (Level 2)	Moderate risk (Level 3)

It was concluded that the <u>overall</u> the expected avifaunal impacts of the proposed projects were overall rated to be of Moderate significance and negative status pre-mitigation. However, with appropriate mitigation, the post-mitigation significance of all the identified impacts should be reduced to Low negative. It is therefore recommended that the activity is authorised from an avifaunal perspective, on condition that the proposed mitigation measures as detailed above and in the EMPr (Appendix G and Appendix H of this BA Report) are strictly implemented.

Socio-Economic Assessment

The Socio-Economic Assessment was undertaken by Sandra Hill to inform the outcome of this BA from a socio-economic perspective. The complete Socio-Economic Assessment is included in Appendix C.7 of the BA Report. The following direct and cumulative impacts for the construction, operational and decommissioning phases were identified.

Impact	Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Significance / Ranking (Post-Mitigation and Post-Enhancement)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Impact 1: Disruption of local social structures	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 2: Increased social ills and risky behaviours	**Moderate risk (Level 3)**	**Low risk (Level 4)**
• Impact 3: Increased burden on existing social and bulk services	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 4: Increased road use and road traffic related accidents and/or damage	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 5: Loss of privacy, safety and sense of place adjacent project site	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 6: Unrealistic expectations regarding local job creation	**Low risk (Level 4)**	**Very low risk (Level 5)**
• Impact 7: Creation of temporary employment	**Moderate risk (Level 3)**	**Moderate risk (Level 3)**
• Impact 8: Increased household income attainment and standard of living	**Moderate risk (Level 3)**	**Moderate risk (Level 3)**
• Impact 9: Potential increase in crime	**Moderate risk (Level 3)**	**Low risk (Level 4)**

Impact	Significance / Ranking (Pre-Mitigation and Pre-Enhancement)	Significance / Ranking (Post-Mitigation and Post-Enhancement)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Impact 10: Potential decrease in local tourism	**Low risk (Level 4)**	**Very low risk (Level 5)**
• Impact 11: Potential marginalisation of local residents	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 12: Development and/or growth of locally-owned industries	**Low risk (Level 4)**	**Low risk (Level 4)**
DIRECT IMPACTS - OPERATIONAL PHASE		
• Impact 1: Creation of long-term employment	**Very low risk (Level 5)**	**Very low risk (Level 5)**
• Impact 2: Development and/or growth of locally-owned industries	**Very low risk (Level 5)**	**Very low risk (Level 5)**
• Impact 3: Human development via the EDP	**Moderate (Level 3)**	**High (Level 2)**
DIRECT IMPACTS - DECOMMISSIONING PHASE		
• Impact 1: Job losses	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 2: Local economy stimulation	**Low risk (Level 4)**	**Low risk (Level 4)**
CUMULATIVE IMPACTS - CONSTRUCTION AND OPERATIONAL PHASE		
• Impact 1: Exacerbated in-migration of job seekers	**Low risk (Level 4)**	**Low risk (Level 4)**
• Impact 2: Combined human development caused by multiple EDPs being implemented	**Moderate risk (Level 3)**	**Moderate risk (Level 3)**

Given the overall very low to low significance of potential negative impacts associated with the project, as compared to the overall very low to high significance of potential positive impact of the project; it can be concluded that the prospective socio-economic benefits of the proposed project outweigh the socio-economic losses/impacts.

Geohydrology Assessment

The Geohydrology Assessment was undertaken by Charl Muller and Julian Conrad of GEOSS South Africa (PTY) Ltd to inform the outcome of this BA from a geohydrological perspective. The complete Geohydrology Assessment is included in Appendix C.8 of the BA Report. The following direct impacts for the construction phase were identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Lowering of groundwater levels as a result of over-abstraction	**Moderate risk (Level 3)**	**Low risk (Level 4)**
• Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages	**Very low risk (Level 5)**	**Very low risk (Level 5)**

The power lines and EGI do not have any operational water usage and thus are not considered to have an impact on the groundwater. The study concluded that no impacts of significance could be identified and therefore does not pose any risk to the geohydrological conditions on site. The Geohydrology specialist has recommended that the proposed project be allowed to proceed.

Traffic Impact Statement

A **technical** Traffic Impact Statement was undertaken and included in Appendix J of the BA Report. The impacts include the following for the construction and decommissioning phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES		
• Potential congestion and delays on the surrounding road network	**Very low risk (Level 5)**	**Very low risk (Level 5)**
• Potential impact on traffic safety and increase in accidents with other vehicles or animals	**Low risk (Level 4)**	**Low risk (Level 4)**
• Potential change in the quality of the surface condition of the roads	**Very low risk (Level 5)**	**Very low risk (Level 5)**
• Potential dust pollution as a result of the construction and decommissioning phase vehicles	**Low risk (Level 4)**	**Low risk (Level 4)**
• Potential noise pollution as a result of the construction and decommissioning phase vehicles	**Low risk (Level 4)**	**Low risk (Level 4)**
CUMULATIVE IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES		
• Potential congestion and delays on the surrounding road network	**Low risk (Level 4)**	**Very low risk (Level 5)**
• Potential impact on traffic safety and increase in accidents with other vehicles or animals	**Low risk (Level 4)**	**Low risk (Level 4)**
• Potential change in the quality of the surface condition of the roads	**Low risk (Level 4)**	**Very low risk (Level 5)**
• Potential dust pollution as a result of the construction and decommissioning phase vehicles	**Low risk (Level 4)**	**Low risk (Level 4)**
• Potential noise pollution as a result of the construction and decommissioning phase vehicles	**Low risk (Level 4)**	**Low risk (Level 4)**

The Traffic Impact Statement confirmed that provided that the above mitigation measures are adhered to, the proposed development of the proposed projects are supported from a traffic engineering perspective. No other remedial or mitigation measures will be required to accommodate the additional traffic generated by the proposed projects.

EAP'S RECOMMENDATION

No negative impacts have been identified within this BA that, in the opinion of the EAPs who have conducted this BA Process, should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project. This echoes the findings of the specialists as summarised above.

Section 24 of the Constitutional Act states that "everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development." Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the Environmental Management Programme (EMPr) included in Appendix G and Appendix H of this BA Report).

It is understood that the information contained in this BA Report and appendices is sufficient to make a decision in respect of the activity applied for.

Summary of Key Impact Assessment Findings

Based on the findings of the specialist studies, the proposed project is considered to have an overall low negative environmental impact and an overall low to moderate positive socio-economic impact (with the implementation of respective mitigation and enhancement measures). Table D below provides a summary of the impact assessment for each phase of the proposed projects **post mitigation for direct impacts**. Table E provides the same information for the **cumulative impacts**.

As indicated in Table D, it is clear that the majority of the **direct negative impacts** were rated with a **low to very low post mitigation impact significance** for the **construction phase**, with only the Terrestrial Biodiversity and Species and Avifauna impacts being rated as **moderate**. In terms of the operational and decommissioning phases, the majority of the **direct negative impacts** were rated with a **low post mitigation impact significance**, with only the Avifauna impacts being rated as **moderate**. In terms of **positive impacts**, the Socio-Economic impacts are rated as **low to moderate significance** for the construction phase; **very low to high** for the operational phase; and **low** for the decommissioning phase.

Based on Table E, the majority of the **cumulative negative impacts** were rated with a **low post mitigation impact significance** for the **construction phase**, with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as **moderate**. The same trend is applicable to the **operational phase**, with visual impacts being rated as **moderate**. During the decommissioning phase, cumulative impacts were not identified and/or were considered insignificant, however for those that were rated, it resulted in an overall **low to very low post mitigation impact significance,** with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as **moderate**. In terms of **positive impacts**, the Socio-Economic impacts are rated as **moderate significance** for the construction and operational phases.

Table D. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the Proposed Projects

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Visual	**Low**		**Low**		**Very Low**	
Heritage (Archaeology and Cultural Landscape)	**Low**		**Low**		**Low**	
Palaeontology	**Very Low**		**Insignificant and/or not identified and/or not applicable**		**Insignificant and/or not identified and/or not applicable**	
Terrestrial Biodiversity and Species	**Moderate**		**Low**		**Low**	
Aquatic Biodiversity and Species	**Low**		**Low**		**Low**	
Riverine Rabbit	**Low**		**Low**		**Insignificant and/or not identified and/or not applicable**	
Avifauna	**Not identified**		**Moderate**		**Not identified**	
Socio-Economic	**Very Low**	**Low**	**Insignificant and/or not identified and/or not applicable**		**Low**	
Geohydrology	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**		**Insignificant and/or not identified and/or not applicable**	
Traffic	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**		**Low**	**Very Low**
DIRECT POSITIVE IMPACTS						
Socio-Economic	**Low**	**Moderate**	**Very Low**	**High**	**Low**	

Table E. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the Proposed Projects

Specialist Assessment	Construction Phase		Operational Phase	Decommissioning Phase	
CUMULATIVE NEGATIVE IMPACTS					
Visual	**Low**		**Low**	**Very Low**	
Heritage (Archaeology and Cultural Landscape)	**Moderate**		**Moderate**	**Moderate**	
Palaeontology	**Very Low**		**Insignificant and/or not identified and/or not applicable**	**Insignificant and/or not identified and/or not applicable**	
Terrestrial Biodiversity and Species	**Low**		**Low**	**Neutral**	
Aquatic Biodiversity and Species	**Low**		**Low**	**Insignificant and/or not identified and/or not applicable**	
Riverine Rabbit	**Low**		**Low**	**Insignificant and/or not identified and/or not applicable**	
Avifauna	**Not identified**		**Low**	**Not identified**	
Socio-Economic	**Low**		**Low**	**Insignificant and/or not identified and/or not applicable**	
Geohydrology	**Insignificant**		**Insignificant**	**Insignificant and/or not identified and/or not applicable**	
Traffic	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**	**Low**	**Very Low**
CUMULATIVE POSITIVE IMPACTS					
Socio-Economic	**Moderate**		**Moderate**	**Insignificant and/or not identified and/or not applicable**	

All of the specialists have recommended that the proposed projects receive EAs if the recommended mitigation measures are implemented.

Overall Environmental Impact Statement

Taking into consideration the findings of the BA Process, as well as the fact that the proposed projects will be located within Komsberg REDZ (REDZ 2), it is the opinion of the EAP, that the project benefits outweigh the costs and that the project will make a positive contribution to sustainable infrastructure development in the Ceres Karoo, Ceres and Touws River regions. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed projects receive EAs in terms of the EIA Regulations promulgated under the NEMA. It is recommended that each EA be valid for a period of 10 years. As noted above, the request for the issuing multiple EAs in terms of Regulation 25 (1) and (2) has been approved by the DEFF, hence it is anticipated that, should they be granted, nine EAs will be issued for the EGI.

Cumulative Environmental Impact Statement

The cumulative impacts have been assessed by all the specialists on the project team. The cumulative assessment included approved renewable energy projects within a 30 km radius of the project sites, as well as existing and planned transmission lines, as well as all nine proposed Veroniva PV projects and nine proposed Veroniva power line projects. No cumulative impacts have been identified that were considered to be fatal flaws. The specialists recommended that the projects receive EA in terms of the EIA Regulations promulgated under the NEMA, including consideration of cumulative impacts. It is also important to note that the proposed project site is located within REDZ 2 (Komsberg REDZ), which supports the development of large scale wind and solar energy developments. The proposed projects are therefore in line with the national planning vision for wind and solar development in South Africa.

Summary of where requirements of Appendix 1 of the 2014 NEMA EIA Regulations (as amended, GN R326) are provided in this BA Report

Appendix 1	YES / NO	SECTION IN BA REPORT
Objective of the basic assessment process 2) The objective of the basic assessment process is to, through a consultative process- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context; b) identify the alternatives considered, including the activity, location, and technology alternatives; c) describe the need and desirability of the proposed alternatives; d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine- (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and (ii) the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; and e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to- (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.	**Yes**	**Section A of the report includes the Introduction, legislative review, alternatives assessment and needs and desirability** **Section D includes a summary of the specialist studies and associated impact assessments undertaken**
Scope of assessment and content of basic assessment reports 3) (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include: (a) details of: (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	**Yes**	**Section A.2**
(b) the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	**Yes**	**Section A.4**
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	**Yes**	**Section A.3 and Section A.4**
(d) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the activities to be undertaken including associated structures and infrastructure;	**Yes**	**Section A.5 and Section A.11**
(e) a description of the policy and legislative context within which the	**Yes**	**Section A.10**

Appendix 1	YES / NO	SECTION IN BA REPORT
development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;		
f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	**Yes**	**Section A.14**
(g) a motivation for the preferred site, activity and technology alternative;	**Yes**	**Section A.13**
(h) A full description of the process followed to reach the proposed preferred alternative within the site, including - (i) details of all the alternatives considered;	**Yes**	**Section A.13**
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	**Yes**	**Section C**
(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	**Yes**	**Section C**
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	**Yes**	**Section A.13 and Section B**
(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	**Yes**	**Section A.13**
(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	**Yes**	
(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	**Yes**	
(viii) the possible mitigation measures that could be applied and level of residual risk;	**Yes**	
(ix) the outcome of the site selection matrix;	**Yes**	
(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	**Yes**	
(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity.	**Yes**	**Section A.13**
(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including- (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	**Yes**	**Section A.13**
(j) an assessment of each identified potentially significant impact and risk, including- (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk;	**Yes**	**Section D and Appendix C**

Appendix 1	YES / NO	SECTION IN BA REPORT
(iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;		
(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	**Yes**	**Section D and Section E**
(l) an environmental impact statement which contains- (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	**Yes**	**Section E**
(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;	**Yes**	**Section D**
(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	**Yes**	**Section E**
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	**Yes**	**Please refer to each specialist study included in Appendix C**
(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	**Yes**	**Section E**
(q) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	**X**	**Not Applicable. Refer to Appendix D.15 for feedback to this query from the DEFF. Refer to Section E of this Final BA Report for feedback on the recommended validity period of the EAs.**
(r) an undertaking under oath or affirmation by the EAP in relation to - (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties; and	**Yes**	**Appendix E**
(s) where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	**X**	**N/A**
(t) any specific information that may be required by the competent authority; and	**Yes**	**Comments raised by the DEFF during the 30-day review of the Draft BA Reports have been addressed at relevant points throughout the Final BA Report. Refer to Appendix D and Appendix I for copies of specific information**

Appendix 1	YES / NO	SECTION IN BA REPORT
		requested by the DEFF, as well as pre-application discussions.
(u) any other matters required in terms of section 24(4)(a) and (b) of the Act.	**X**	**N/A**
2) Where a government notice *gazetted* by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply.	**Yes**	**Refer to Section A.10 for a breakdown of the relevant gazettes that are applicable.**

SECTION A: INTRODUCTION, PROJECT DESCRIPTION; ALTERNATIVES; LEGISLATION; SCREENING TOOL

A.1 Introduction

The Project Developer, Veroniva (PTY) Ltd (hereinafter referred to as Veroniva), is proposing to design, construct and operate a total of **nine** Solar Photovoltaic (PV) power generation facilities and associated infrastructure, approximately 90 km north-east of Ceres and 70 km north of Touws River, in the Western Cape Province. The proposed projects are located within the Witzenberg Local Municipality, which falls within the Cape Winelands District Municipality. Each PV facility will have a capacity of 175 MW (i.e. 9 X 175 MW). The associated infrastructure includes various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, nine 132 kV power lines, nine on-site substations, and nine Lithium Ion Battery Energy Storage Systems (BESS). The proposed nine Solar PV facilities will make use of PV solar technology to generate electricity from energy derived from the sun; and will connect to the national grid at the existing Eskom Kappa Substation. The locality of the proposed projects is depicted in Figure A.1 below. This BA Report addresses two Solar PV facilities, as discussed below. **<u>This report only covers the proposed EGI to support the nine PV Facilities. Separate reports have been compiled for the PV projects.</u>**

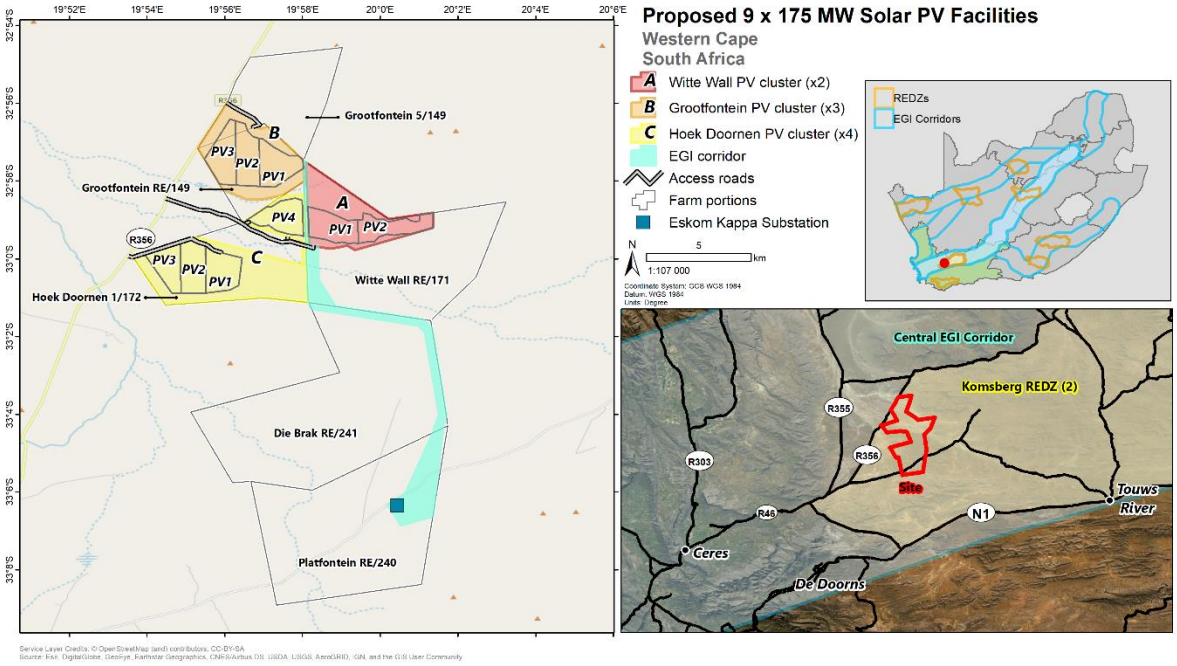


Figure A.1. Locality of the nine Proposed PV Projects and EGI Corridor

Each proposed project will be developed by a separate Project Applicant. The Project Names, Project Applicants, and respective farm portions affected by the proposed PV facilities, EGI and associated infrastructure are shown in Table A.1 below.

Table A.1. Project Names, Applicants and the main Affected Farm Portions

Project Name	Project Applicant	Affected Farm Portions (PV Facility and Associated Infrastructure)	Affected Farm Portions (Power Lines)
Witte Wall PV 1	Witte Wall PV 1 (PTY) LTD	▪ Witte Wall RE/171	▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Witte Wall PV 2	Witte Wall PV 2 (PTY) LTD		
Grootfontein PV 1	Grootfontein PV 1 (PTY) LTD	▪ Grootfontein RE/149 ▪ Grootfontein 5/149	▪ Grootfontein RE/149 ▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Grootfontein PV 2	Grootfontein PV 2 (PTY) LTD		
Grootfontein PV 3	Grootfontein PV 3 (PTY) LTD		
Hoek Doornen PV 1	Hoek Doornen PV 1 (PTY) LTD	▪ Hoek Doornen 1/172	▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Hoek Doornen PV 2	Hoek Doornen PV 2 (PTY) LTD		
Hoek Doornen PV 3	Hoek Doornen PV 3 (PTY) LTD		
Hoek Doornen PV 4	Hoek Doornen PV 4 (PTY) LTD		

The proposed projects are located entirely within the Komsberg Renewable Energy Development Zone (REDZ 2), one of the eight REDZs formally gazetted in South Africa for the purpose of developing solar and wind energy generation facilities (Government Gazette 41445, Government Notice (GN) 114; 16 February 2018). Refer to Figure A.1 for the locality of the proposed projects in relation to the REDZs. In line with the gazetted process for projects located within a REDZ, the proposed projects are subject to a Basic Assessment (BA) process instead of a full Scoping and Environmental Impact Assessment (EIA) process and a reduced decision making period of 57 days, in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772; in GN R326, R327, R325 and R324 on 7 April 2017. A BA Process in terms of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) has therefore been undertaken for the proposed projects. The Competent Authority for the proposed projects is the National Department of Environment, Forestry and Fisheries (DEFF).

Based on discussions with the DEFF in August 2020 and September 2020, the option to apply for combining the Applications for EA in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and the issuing of multiple EAs in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended) was discussed. It was confirmed that a letter must be submitted to the DEFF to motivate for the combination and issuing of multiple EAs. The combination request was submitted to the DEFF via email on 9 September 2020 and it was made specifically in terms of the following regulations of the 2014 NEMA EIA Regulations (as amended):

- Regulation 11 (4): *"If one or more proponents intend undertaking interrelated activities at the same or different locations within the area of jurisdiction of a competent authority, the competent authority may, in writing, agree that the proponent or proponents submit a single application in respect of all of those activities and to conduct a consolidated assessment process but the potential environmental impacts of each activity, including its cumulative impacts, must be considered in terms of the location where the activity is to be undertaken".*

- Regulation 25 (1) and (2): "*(1) If the competent authority decides to grant authorisation, the competent authority must issue an environmental authorisation or environmental authorisations complying with regulation 26 to, and in the name of, the applicant or applicants. (2) If the competent authority decides to grant authorisation in respect of an application, the competent authority may issue a single environmental authorisation or multiple environmental authorisations in the name of the same or different applicants covering all aspects for which authorisation is granted*".

It was motivated to the DEFF to submit a combined Application for Environmental Authorisation (EA) in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and for the issuing of multiple EAs (should they be granted) in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended), and to undertake a consolidated assessment process for interrelated activities noted above (i.e. solar PV developments, power line developments, substation developments and associated infrastructure to support the facilities) on various adjacent farm portions in the same overall locality (as illustrated in Figure A.1 and noted in Table A.1 above). In order to ensure that the potential environmental impacts of each activity, including its cumulative impacts, in relation to the location at which they will take place, are considered, the reporting structure indicated in Table A.2 is being undertaken. The combined reporting process reduces the administrative aspects on the case officer and reduces the number of reports that need to be reviewed by Interested and Affected Parties (I&APs), while still maintaining high levels of environmental rigour and clear reporting. The combination and multiple EA request was approved by the DEFF on 6 October 2020. A copy of the approval letter from the DEFF is included in Appendix I of this BA Report.

Therefore, four separate BA Reports have been compiled, as indicated in Table A.2 below, and it is proposed that nine separate EAs will be issued for each PV Facility and associated infrastructure, as well as nine separate EAs for the power lines and associated EGI that are required to support the nine PV Facilities (should they be granted).

Table A.2. BA Reporting Structure and Components

	Report 1: Witte Wall Farm	**Report 2: Grootfontein Farm**	**Report 3: Hoek Doornen Farm**	**Report 4: EGI (i.e. this report)**
BA Reports	**Group 1**: Witte Wall Farm: 1 BA Report that covers the 2 PV Facilities (i.e. Witte Wall PV 1 and PV 2), 2 on-site substations, 2 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations).	**Group 2**: Grootfontein Farm: 1 BA Report that covers the 3 PV Facilities (i.e. Grootfontein PV 1, PV 2 and PV 3), 3 on-site substations, 3 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations).	**Group 3**: Hoek Doornen Farm: 1 BA Report that covers the 4 PV Facilities (i.e. Hoek Doornen PV 1, PV 2, PV 3 and PV 4), 4 on-site substations, 4 Lithium Ion BESS's and all associated infrastructure. For the substations, this includes the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations).	**Group 4**: EGI to support the PV Facilities: 1 BA Report that covers all the power lines and associated EGI[1] that are required to support the 9 PV Facilities (i.e. 9 Power Lines and the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section) of the proposed on-site substations up to the line bay at the Eskom Kappa Substation).
EAs to be Issued (Should	▪ EA 1 for Witte Wall PV 1 ▪ EA 2 for Witte Wall PV 2	▪ EA 3 for Grootfontein PV 1 ▪ EA 4 for Grootfontein PV 2 ▪ EA 5 for Grootfontein PV 3	▪ EA 6 for Hoek Doornen PV 1 ▪ EA 7 for Hoek Doornen PV 2 ▪ EA 8 for Hoek Doornen PV 3 ▪ EA 9 for Hoek Doornen PV 4	▪ EA 1 for Witte Wall PV 1 EGI ▪ EA 2 for Witte Wall PV 2 EGI ▪ EA 3 for Grootfontein 1 EGI ▪ EA 4 for Grootfontein 2 EGI

[1] It is important to note that all high voltage infrastructure leading up to the Point of Connection (i.e. The Project Applicant's section of the proposed on-site substation) is covered by the BA for the PV Facilities (Groups 1 – 3 BA Reports). High voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substation) up to the line bay at the Eskom Kappa Substation may be handed over to Eskom and is covered in the BA for the EGI to support the PV Facilities (i.e. Group 4 BA Report)).

	Report 1: Witte Wall Farm	Report 2: Grootfontein Farm	Report 3: Hoek Doornen Farm	Report 4: EGI (i.e. this report)
they be granted)				▪ EA 5 for Grootfontein 3 EGI ▪ EA 6 for Hoek Doornen 1 EGI ▪ EA 7 for Hoek Doornen 2 EGI ▪ EA 8 for Hoek Doornen 3 EGI ▪ EA 9 for Hoek Doornen 4 EGI

The specialists have each compiled **three consolidated reports per specialist theme**, which includes a clear assessment of the following:

- **Report 1**: Witte Wall Farm: This report includes the 2 PV Facilities (i.e. Witte Wall PV 1 and Witte Wall PV 2), 2 Power Lines, 2 on-site substations, 2 Lithium Ion BESS's and associated infrastructure;
- **Report 2**: Grootfontein Farm: This report includes the 3 PV Facilities (i.e. Grootfontein PV 1, Grootfontein PV 2, and Grootfontein PV 3), 3 Power Lines, 3 on-site substations, 3 Lithium Ion BESS's and associated infrastructure; and
- **Report 3**: Hoek Doornen Farm: This report includes the 4 PV Facilities (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), 4 Power Lines, 4 on-site substations, 4 Lithium Ion BESS's and associated infrastructure.

Combined Applications for EA were submitted to the DEFF together with the Draft BA Reports. Since the proposed nine 175 MW Solar PV facilities, associated infrastructure and EGI are located within the same geographical area and constitute the same type of activity (i.e. generation and distribution of electricity generated from a solar resource), an integrated Public Participation Process (PPP) was undertaken for the BA projects. This approach has been confirmed with the DEFF at the pre-application meeting and based on approval of the Public Participation Plan (as included in Appendix I of this Final BA Report).

This Final BA Report only deals with the proposed **EGI to support the nine proposed PV Facilities**. A map indicating the locality of the proposed projects are indicated in Figure A.2.

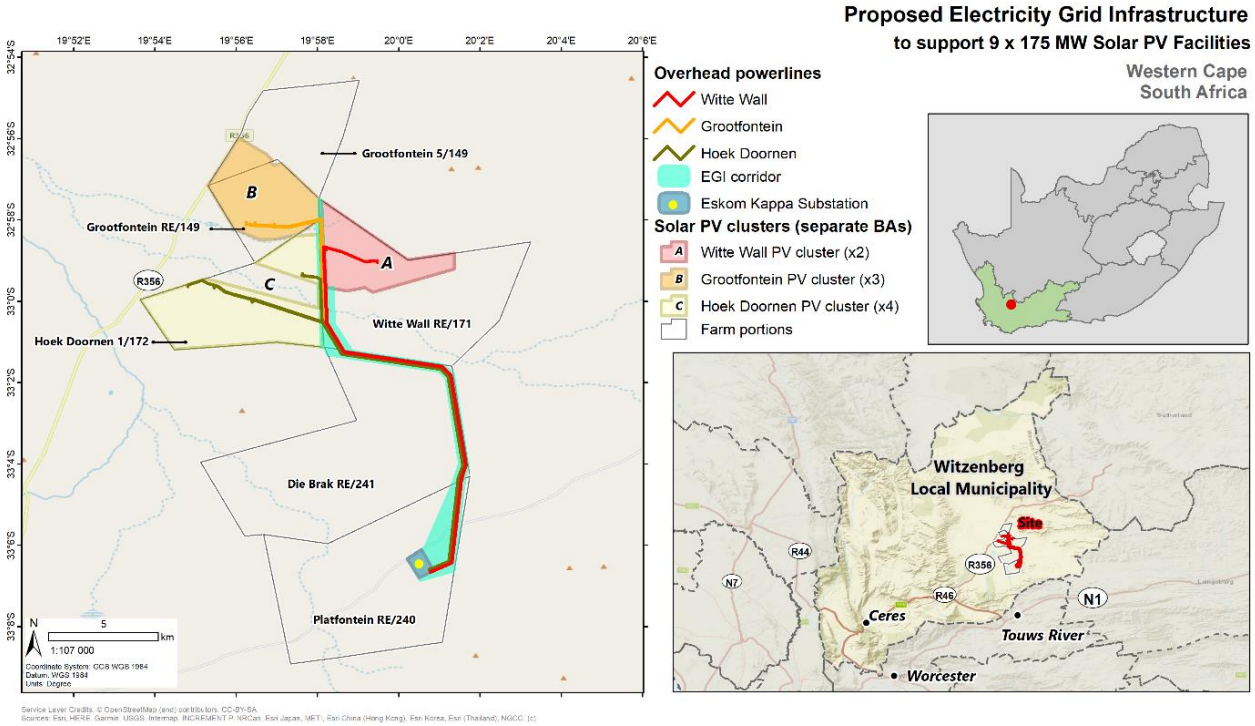


Figure A.2. Locality of the nine Proposed PV Projects and EGI Corridor within which the nine power lines will be constructed.

The Draft BA Report was released to all I&APs, Organs of State and stakeholders for a 30-day review period, extending from 3 December 2020 to 25 January 2021. All comments submitted during the 30-day review period have been captured in a detailed Comments and Responses Report (Appendix D of this Final BA Report), and have been incorporated and addressed, as applicable and where relevant, into this Final BA Report. The Final BA Report has been submitted to the DEFF, in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20, however with a reduced 57-day timeframe (as the proposed projects fall within the REDZ 2, as explained above).

A.2 Project Team

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Project Developer has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the separate BA Processes in order to determine the biophysical, social and economic impacts associated with undertaking the proposed development.

The BA is being led by the Environmental Assessment Practitioner (EAP) and Project Leader, Paul Lochner. Paul Lochner has more than 26 years of experience in Environmental Assessment and management studies, primarily in the leadership and integration functions. This includes Strategic Environmental Assessments (SEAs), EIAs and Environmental Management Plans (EMPs). Paul has extensive experience in conducting Environmental Assessment and management processes across South Africa and internationally. Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA). He has been Project Leader on numerous renewable energy, ports and oil and gas related environmental studies and assessments.

He has also authored several Guidelines, such as the Guideline for EMPs published in 2005 by the Western Cape government, and was lead author on the introductory "Overview of IEM" document for the DEAT IEM Series. He was also Project Leader for the Wind and Solar REDZs SEAs Phase 1 and 2, within which the proposed projects will take place.

Rohaida Abed, serves as the Project Manager, and is an EAP in the EMS group of the CSIR. She has 10 years of experience in the Environmental Management field, and has been involved in various transport infrastructure related projects as an Environmental Control Officer. She has also been involved in BAs and EIAs relating to renewable energy, port infrastructure and Bulk Liquid Storage facilities in the capacity of Project Manager. She also worked on the SEA for Gas Pipeline and EGI, which was commissioned by the National Departments of Environmental Affairs, Energy and Public Enterprises. She is a registered Professional Natural Scientist (400247/14) with the South African Council for Natural Scientific Professions (SACNASP).

Dhiveshni Moodley is the Project Officer on the BA and is an EAP Intern in the EMS group of the CSIR. She holds a MSc in Environmental Science from the University of KwaZulu-Natal and has experience in the research and consulting sectors. She also has experience in GIS and remote sensing applications.

Various specialists and additional members from the CSIR have contributed to these BAs. The team which is involved in this BA Process is listed in Table A.3 below.

Table A.3. Details of the BA Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (*Registered EAP (2019/745)*)	CSIR	EAP and Project Leader
Rohaida Abed (*Pr.Sci.Nat.*)	CSIR	Project Manager
Dhiveshni Moodley (*Cand.Sci.Nat.*)	CSIR	Project Officer
Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Project Mapping
Lizande Kellerman (*Pr.Sci.Nat.*)	CSIR	Project Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.*)	Private	Agricultural Compliance Statement
Quinton Lawson	Quinton Lawson Architect (QARC)	Visual Impact Assessment
Bernard Oberholzer	Bernard Oberholzer Landscape Architect (BOLA)	
Dr. Jayson Orton	ASHA Consulting	Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology)
Dr. John Almond	Natura Viva cc	
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Terrestrial Biodiversity and Species Impact Assessment
Simon Todd (*Pr.Sci.Nat.*)	3Foxes Biodiversity Solutions	Riverine Rabbit
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Aquatic Biodiversity and Species Impact Assessment
Chris van Rooyen and Albert Froneman (*Pr.Sci.Nat.*)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Sandra Hill	Private	Socio-Economic Impact Assessment
Charl Muller and Julian Conrad	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment
Lizande Kellerman (*Pr.Sci.Nat.*), Rohaida Abed (*Pr.Sci.Nat.*), Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Civil Aviation Site Sensitivity Verification
Technical Input		
Annebet Krige *Pr Eng*	Sturgeon Consulting	Traffic Impact Statement

A.3 Project Overview in terms of Energy Planning

As noted above, the proposed projects fall within the REDZ 2 (i.e. Komsberg REDZ) which was promulgated in GN 114 in February 2018. The REDZs represent areas where wind and solar PV development is being incentivised from resource, socio-economic and environmental perspectives. The Wind and Solar Phase 1 SEA identified REDZs in five provinces, namely the Eastern Cape, Western Cape, Northern Cape, Free State and North West. A BA Process was undertaken instead of a full Scoping and EIA Process, and is subjected to a reduced decision-making timeframe.

In addition, five EGI Power Corridors were gazetted for implementation on 16 February 2018 in Government Gazette 41445, GN 113. The Gazette documented notice, given by the Minister of Environmental Affairs, of alternative procedures to be followed when applying for EA for large scale electricity transmission and distribution development activities, identified in terms of section 24(2)(a) of the NEMA in the identified Strategic Transmission Corridors (i.e. areas declared as geographical areas of strategic importance). Developers proposing to submit applications for EA for large scale

electricity transmission infrastructure within any of the five gazetted Strategic Transmission Corridors, that trigger Listed Activity 9 of Listing Notice 2 of the 2014 NEMA EIA Regulations (as amended), or any other listed and specified activities that are necessary for the realisation of such infrastructure and facilities, would need to follow a BA Process, as opposed to a full Scoping and EIA Process. The proposed projects also fall within the Central EGI Corridor, one of the five EGI Corridors gazetted in February 2018. While Listed Activity 9 of Listing Notice 2 of the 2014 NEMA EIA Regulations (as amended) is not triggered by the proposed projects, the fact that the proposed projects fall within the Central EGI Corridor is still important as it indicates that the proposed project aligns with the strategic objectives of the country in terms of infrastructure placement.

Refer to Figure A.3 below which shows the location of the proposed projects in relation to the REDZ 2 and Central EGI Corridor.

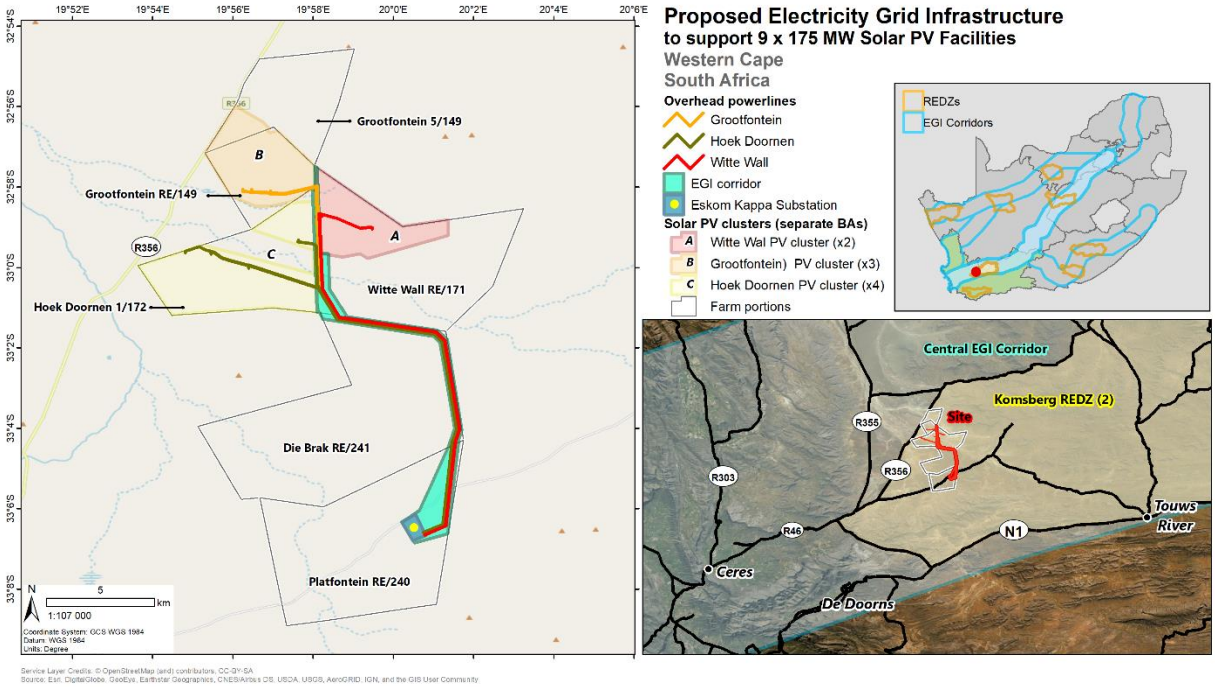


Figure A.3. Project Location in relation to the REDZ 2: Komsberg and Central EGI Corridor

A.4 Project Co-ordinates

The corridor for the proposed power lines, and the actual lines, to support the Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects will take place on the farm portions indicated in Table A.4.

Table A.4. Affected Farm Portion Details

Farm Name	21 Digit Code	Parcel Number	Centroid of the Farm Portion: Decimal Degrees X	Centroid of the Farm Portion: Decimal Degrees Y
Power Lines to Support the Witte Wall PV 1 and Witte Wall PV 2 Facilities				
Remainder of Witte Wall Farm Number 171	C01900000000017100000	171	20.00428	-32.997149
Remainder of Platfontein 240	C01900000000024000000	240	19.988261	-33.114762
Remainder of Die Brak 241	C01900000000024100000	241	19.981326	-33.062957
Power Lines to Support the Grootfontein PV 1, Grootfontein PV 2 and Grootfontein PV 3 Facilities				
Remainder of Grootfontein Farm Number 149	C01900000000014900000	149	19.945826	-32.961469
Portion 1 of Hoek Doornen Farm Number 172	C01900000000017200001	1/172	19.938936	-33.000379
Remainder of Witte Wall Farm Number 171	C01900000000017100000	171	20.00428	-32.997149
Remainder of Platfontein 240	C01900000000024000000	240	19.988261	-33.114762
Remainder of Die Brak 241	C01900000000024100000	241	19.981326	-33.062957
Power Lines to Support the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 Facilities				
Portion 1 of Hoek Doornen Farm Number 172	C01900000000017200001	1/172	19.938936	-33.000379
Remainder of Witte Wall Farm Number 171	C01900000000017100000	171	20.00428	-32.997149
Remainder of Platfontein 240	C01900000000024000000	240	19.988261	-33.114762
Remainder of Die Brak 241	C01900000000024100000	241	19.981326	-33.062957

The co-ordinates of the start, middle and end points of the proposed power lines from the Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects are detailed in Table A.5. Maps corresponding to the co-ordinate points are indicated in Figure A.4, Figure A.5 and Figure A.6.

Table A.5. Co-ordinate Points along the start (e.g. WW1-s), middle (e.g. WW1-m) and end (e.g. WW1-e) points of the proposed power lines to support all nine PV Facilities

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
Power Line to Support the Witte Wall PV 1 Facility				
WW1-s	-32.9787	19.9702	32° 58' 43.489" S	19° 58' 12.719" E
WW1-m	-33.0244	20.0023	33° 1' 27.921" S	20° 0' 8.377" E

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
WW1-e	-33.1109	20.0130	33° 6' 39.326" S	20° 0' 46.776" E
Power Line to Support the Witte Wall PV 2 Facility				
WW2-s	-32.9841	19.9912	32° 59' 2.687" S	19° 59' 28.371" E
WW2-m	-33.0244	20.0010	33° 1' 27.708" S	20° 0' 3.578" E
WW2-e	-33.1108	20.0129	33° 6' 38.878" S	20° 0' 46.506" E
Power Line to Support the Grootfontein PV 1 Facility				
GF1-s	-32.9682	19.9490	32° 58' 5.693" S	19° 56' 56.391" E
GF1-m	-33.0243	19.9997	33° 1' 27.532" S	19° 59' 59.019" E
GF1-e	-33.1107	20.0128	33° 6' 38.429" S	20° 0' 46.235" E
Power Line to Support the Grootfontein PV 2 Facility				
GF2-s	-32.9677	19.9411	32° 58' 3.630" S	19° 56' 27.839" E
GF2-m	-33.0243	19.9984	33° 1' 27.313" S	19° 59' 54.181" E
GF2-e	-33.1106	20.0128	33° 6' 37.980" S	20° 0' 45.965" E
Power Line to Support the Grootfontein PV 3 Facility				
GF3-s	-32.9677	19.9374	32° 58' 3.653" S	19° 56' 14.709" E
GF3-m	-33.0242	19.9969	33° 1' 27.026" S	19° 59' 48.881" E
GF3-e	-33.1104	20.0127	33° 6' 37.531" S	20° 0' 45.685" E
Power Line to Support the Hoek Doornen PV 1 Facility				
HD1-s	-33.0003	19.9399	33° 0' 1.231" S	19° 56' 23.475" E
HD1-m	-33.0239	19.9915	33° 1' 26.135" S	19° 59' 29.425" E
HD1-e	-33.1099	20.0124	33° 6' 35.736" S	20° 0' 44.614" E
Power Line to Support the Hoek Doornen PV 2 Facility				
HD2-s	-32.9945	19.9243	32° 59' 40.337" S	19° 55' 27.432" E
HD2-m	-33.0240	19.9932	33° 1' 26.558" S	19° 59' 35.621" E
HD2-e	-33.1101	20.0125	33° 6' 36.185" S	20° 0' 44.884" E
Power Line to Support the Hoek Doornen PV 3 Facility				
HD3-s	-32.9940	19.9135	32° 59' 38.429" S	19° 54' 48.437" E
HD3-m	-33.0241	19.9945	33° 1' 26.712" S	19° 59' 40.029" E
HD3-e	-33.1102	20.0125	33° 6' 36.634" S	20° 0' 45.155" E
Power Line to Support the Hoek Doornen PV 4 Facility				
HD4-s	-32.9886	19.9605	32° 59' 18.952" S	19° 57' 37.646" E
HD4-m	-33.0241	19.9957	33° 1' 26.881" S	19° 59' 44.537" E
HD4-e	-33.1103	20.0126	33° 6' 37.083" S	20° 0' 45.425" E

The DEFF has also requested the bend point co-ordinates of the proposed power lines. This is included in Appendix A of the Final BA Report, as well as a corresponding layout diagram.

The mid-points of the proposed on-site substations are noted in Table A.6 below.

Table A.6. Co-ordinate Points of the mid-points of the On-Site Substations

Point	Decimal Degrees		Degrees, Minutes, Seconds	
	Latitude (Y)	Longitude (X)	Latitude (S)	Longitude (E)
Hoek Doornen PV 1	-32.99400675	19.91347901	32° 59' 38.424" S	19° 54' 48.524" E
Hoek Doornen PV 2	-32.99455635	19.92431339	32° 59' 40.403" S	19° 55' 27.528" E
Hoek Doornen PV 3	-32.96765545	19.937405	32° 58' 3.560" S	19° 56' 14.658" E
Hoek Doornen PV 4	-32.96767496	19.94106639	32° 58' 3.630" S	19° 56' 27.839" E
Grootfontein PV 1	-32.96824683	19.94900879	32° 58' 5.689" S	19° 56' 56.432" E
Grootfontein PV 2	-32.9886045	19.96048019	32° 59' 18.976" S	19° 57' 37.729" E
Grootfontein PV 3	-32.97874684	19.97019964	32° 58' 43.489" S	19° 58' 12.719" E
Witte Wall PV 1	-32.98399794	19.99113496	32° 59' 2.393" S	19° 59' 28.086" E
Witte Wall PV 2	-33.00032394	19.93987956	33° 0' 1.166" S	19° 56' 23.566" E

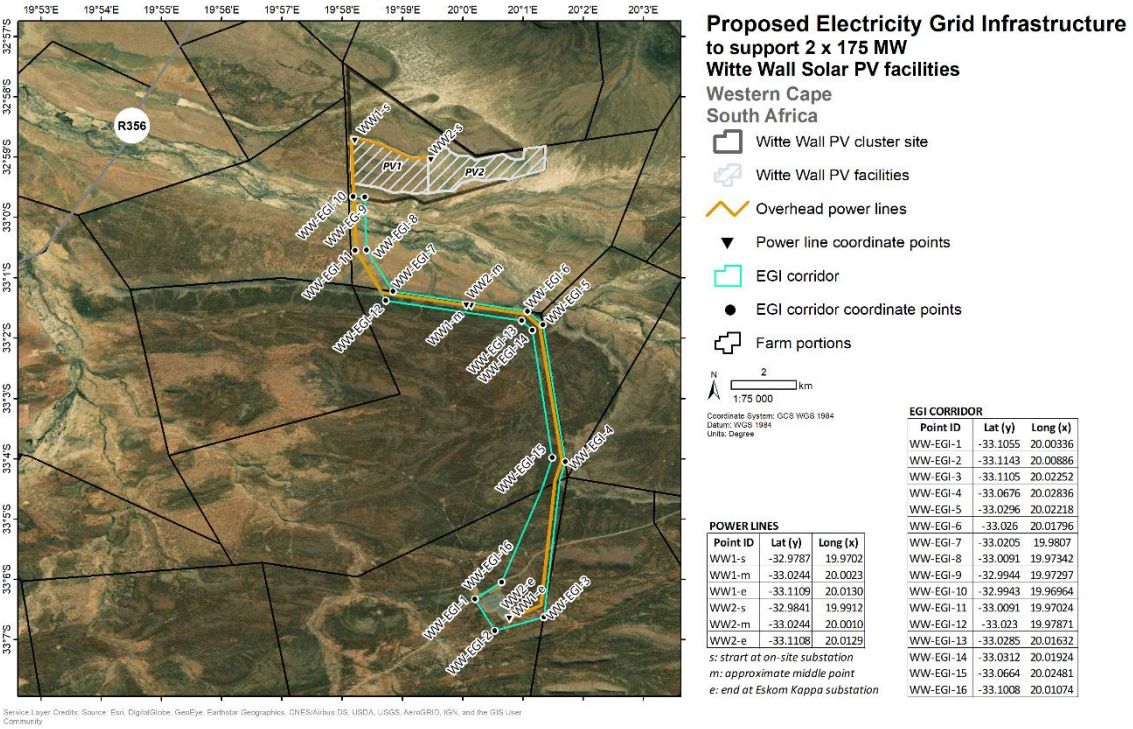


Figure A.4. Witte Wall PV 1 and Witte Wall PV 2 Power Line Co-ordinate Point Map

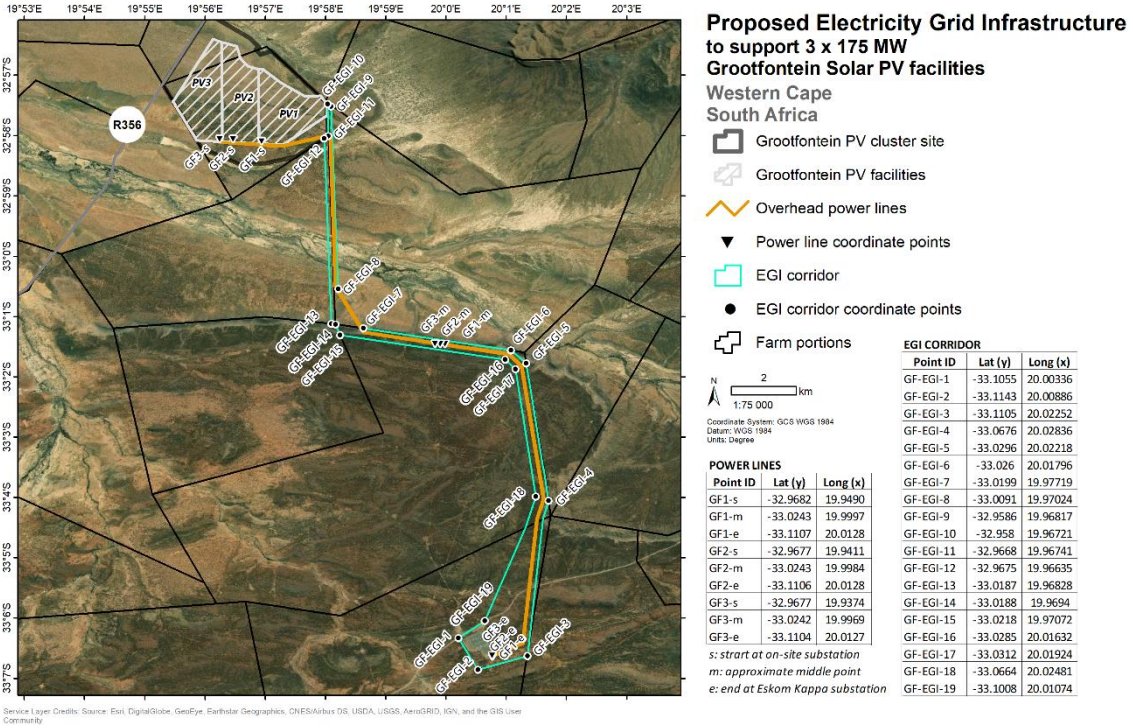


Figure A.5. Grootfontein PV 1, Grootfontein PV 2 and Grootfontein PV 3 Power Line Co-ordinate Point Map

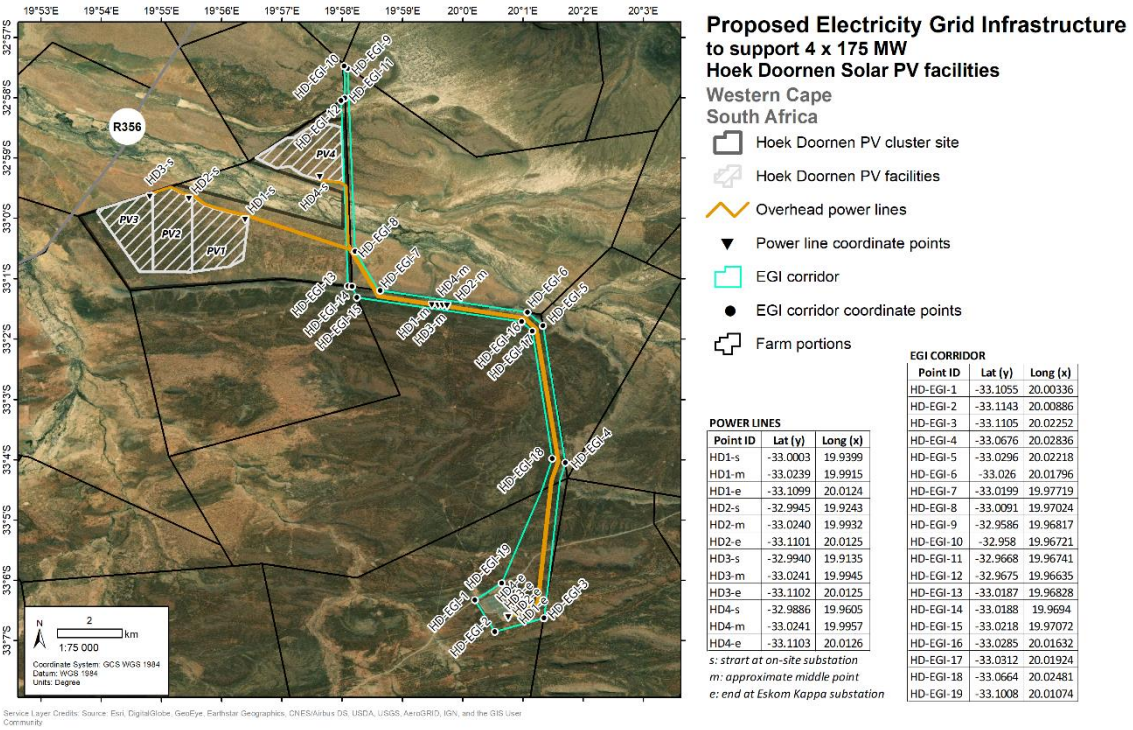


Figure A.6. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 Power Line Co-ordinate Point Map

A.5 Project Description

It is important to point out at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EAs, should they be granted for the proposed projects). As noted above, three separate BA Reports have been compiled for the nine proposed PV Facilities. This Final BA Report only addresses the power lines and associated EGI required to support all nine PV Facilities and to enable connection to the Eskom Kappa Substation.

The proposed projects will make use of PV technology to generate electricity from solar energy and transmit it to the National Grid. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate and transmit electricity for a minimum period of 20 years. The construction phase for each proposed project is expected to extend 12 to 14 months. The proposed projects will consist of the following key components:

- Nine on-site substations and/or a switching substations (the relevant section that will be transferred from the Independent Power Producer);
- Nine 132 kV overhead power lines to connect to the existing Eskom Kappa Substation located within a corridor of approximately 300 m wide;
- Service road of approximately 4 m wide below the power lines;
- Game fences along the power line routes to fence off the servitudes across the farm Witte Wall. Suitable fencing will be placed along the power line corridor on Die Brak; and
- Associated electrical infrastructure at the Eskom Kappa Substation (including but not limited to feeders, Busbars, new transformer bay (up to 500 MVA) and extension to the platform at the Eskom Kappa Substation).

A preliminary site layout plan has been included in Appendix B of this report. A description of the key components of the proposed projects is described below (which applies to all nine power lines).

Following the release of the Draft BA Report for the 30-day comment period, and based on comments received from stakeholders, the layout and area of the Hoek Doornen PV 3 facility was revised slightly. Overall, the Hoek Doornen PV 3 Facility was recessed further away from the boundary of the adjacent Sadawa Farm in order to accommodate a 500 m buffer to take into account the hunting and eco-tourism activities that occur on the farm itself. The footprint of the Hoek Doornen PV 3 Facility was reduced from 250 ha to 210 ha. In addition, the revised layout of the Hoek Doornen PV 3 facility, has resulted in a minor re-alignment of the access road to the Hoek Doornen PV 1, Hoek Doornen PV 2 and Hoek Doornen PV 3 Facilities. These changes are not significant and do no result in any additional impacts that were not considered in the Draft BA Report. Refer to the Final BA Report for the Hoek Doornen PV Facilities (i.e. Report 3) for additional information. These proposed changes to the Hoek Doornen PV 3 Facility does not influence the proposed power lines and EGI supporting the PV facilities.

A.5.1 On-Site Substations

The proposed project will include the construction of nine on-site substations and/or a switching substations collectively (i.e. one for each PV project). The co-ordinates for the mid-points of the substations are noted above.

The on-site substations will be constructed at the PV Facilities and will each range from 7 – 10 m in height, with a maximum footprint of 20 000 m^2. Appendix B of the BA Report includes a facility illustration and example of a typical on-site substation. There is also the requirement for the installation of a lightning mast within the substation yards, which will not be higher than 21 m.

The on-site substation and/or switching substation has two sections, as follows:

- High voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations) which is covered in the separate BA Processes for the PV Facilities (i.e. Report 1, Report 2 and Report 3); and
- High voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substations, planned to be 132 kV) up to the line bay at the Eskom Kappa Substation, which is covered in this BA Process for the EGI (i.e. Report 4; this report).

The high voltage infrastructure extending from the Point of Connection up to the line bay at the Eskom Kappa Substation may be handed over to Eskom.

A.5.2 Power Lines to the Kappa Substation

As explained above, each of the nine solar PV facilities will have a dedicated 132 kV power line that will connect each proposed facility to the Eskom Kappa Substation. This will ensure that each project (should it receive positive EA), is a viable stand-alone project. This approach is based on the worst case scenario (i.e. assessment of nine 132 kV power lines). It has also been structured accordingly to meet the requirements of the Renewable Energy Independent Power Producer Programme (REIPPPP) which requires separate EAs.

However, in terms of the best case scenario, the number of power lines may be reduced, if all nine of the solar PV facilities receive positive EAs, as well as preferred bidder status in terms of the REIPPPP (i.e. the issuing of a PPA from the Department of Mineral Resources and Energy (DMRE)) or a similar procurement process. Should all nine solar PV facilities materialise from a construction perspective, then Veroniva will not construct nine separate power lines (and service roads) connecting each solar facility to the Kappa Substation. Instead, Veroniva will then opt to construct three to four 132 kV power lines that connect to all the proposed facilities to the Kappa Substation, however this is also subjected to the requirements of Eskom. It is necessary to assess nine separate power lines as part of this BA Process because of the uncertainties of the requirements of the REIPPPP, as well as the uncertainties around whether the projects will receive preferred status, and if so, which one will receive it first and be constructed first.

The overhead 132 kV power lines will connect each on-site substation to the Eskom Kappa Substation. The nine power lines will extend approximately 22.5 to 30 m in height. Each line will be constructed within an approximately 33 m wide servitude on the farm properties affected by the power lines. The estimated power line lengths are noted below:

- Witte Wall PV 1 Power Line: Approximately 19 km;
- Witte Wall PV 2 Power Line: Approximately 21 km;
- Grootfontein PV 1 Power Line: Approximately 22 km;
- Grootfontein PV 2 Power Line: Approximately 23 km;
- Grootfontein PV 3 Power Line: Approximately 23 km;
- Hoek Doornen PV 1 Power Line: Approximately 18 km;

- Hoek Doornen PV 2 Power Line: Approximately 20 km;
- Hoek Doornen PV 3 Power Line: Approximately 21 km; and
- Hoek Doornen PV 4 Power Line: Approximately 18 km.

The line will consist of either self-supporting suspension structures or guyed monopoles. Insulators will be used to connect the conductors to the towers. The span lengths are estimated to range between 200 m and 300 m. Exact specifications will be confirmed during the detailed design phase.

As noted above, all power lines will be constructed within the assessed 300 m wide EGI corridor.

Underground power lines are not feasible because of technical losses involved with large lengths of underground cables and high costs. Maintenance is also easier on aboveground power lines in comparison to underground cables, the latter of which would result in more disruption.

A.5.3 Associated Infrastructure

Service roads will also be constructed below the power lines for maintenance purposes. The service roads are expected to be composed of gravel and extend approximately 4 m wide. The road length may vary slightly, depending on the final design.

Game fences will also be installed along the power line routes to fence off the servitudes across the farm Witte Wall. Suitable fencing will be placed along the power line corridor on Die Brak.

Associated electrical infrastructure may also be installed at the Eskom Kappa Substation (including but not limited to feeders, Busbars, new transformer bay (up to 500 MVA) and extension to the platform at the Eskom Kappa Substation).

A laydown area with a maximum footprint of 13 ha will also be constructed at the PV Facilities (details are provided in the separate BA Reports for the PV Facilities).

A.5.4 External Access Roads

The Traffic Impact Statement (Appendix J of the BA Report) states that existing road infrastructure is well developed in the area and thus well connected to surrounding major centres via regional routes. The combination of national roads and first and second order roads provides good inter- and intra-regional accessibility. According to the Western Cape Government Road Network Information System (RNIS), the paved main roads in the vicinity of the proposed PV plants are in a fair to poor condition. Road freight, transport, specifically heavy vehicle transport, significantly contributes to the deterioration of main road surfaces and maintenance of these roads is not always adequate. The main gravel roads are in good to fair condition. However, based on feedback received from surrounding landowners, residents of the Ceres Karoo in proximity to the project sites, and I&APs, the condition of the R356 is not in a good condition.

The proposed project sites can be accessed via the R356 (i.e. Main Road (MR) 319) and various existing, private gravel roads along the MR319. The existing gravel roads will be widened and upgraded for the proposed projects, with a width ranging between 4 – 8 m. Exact specifications of the widening and upgrading of the private gravel roads will be confirmed during the detailed design phase. Additional detail is included in the separate BA Reports for the PV Facilities (as well as the associated listed activities).

The MR319 is a 6.0 m gravel road within a 25.0 m road reserve and connects with the R355 (Main Road 316) to the south-west and traverses the Northern Cape Provincial boundary in the east to connect with the R354. MR319 can be classified as a Rural Class 3 Minor Arterial for which the Western Cape Government is the controlling authority. Figure A.7 provides an indication of the MR319.

Figure A.7. Condition of the MR 319 / R356 to be used to access the site

A.6 Overview of the Project Development Cycle

The project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has therefore been assessed by the specialist studies (summarised in Section D and full studies included Appendix C of this BA Report).

A.6.1 Construction Phase

The construction phase will take place subsequent to the issuing of EAs from the DEFF and a successful bid in terms of the REIPPPP (i.e. the issuing of a PPA from the DMRE). The construction phase for the proposed project is expected to extend 12 to 14 months.

The main activities that will form part of the construction phase per PV project are:

- Removal of vegetation for the proposed infrastructure, where necessary;
- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Stockpiling of topsoil and cleared vegetation, where necessary;
- Creation of employment opportunities;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the power lines, substations and additional infrastructure.

A.6.2 Operational Phase

The following activities will occur during the operational phase per PV project:

- The transmission of electricity generated by the proposed solar facility; and
- Maintenance of the EGI and associated infrastructure.

During the life span of the proposed projects (approximately 20 years each), on-going maintenance will be required on a scheduled basis. In general, maintenance on the structures will involve visual inspection, and only equipment that fails will be replaced in manner similar that of construction activities. The EMPr (Appendix G and Appendix H of this Final BA Report) includes the requirement for method statements to be compiled prior to the operational phase to describe the manner in which maintenance will be undertaken for the structures and infrastructure impacting on watercourses.

A.6.3 Decommissioning Phase

The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise, the decommissioning procedures will be undertaken in line with the EMPr and the sites will be rehabilitated and returned to the pre-construction state.

A.7 Socio-Economic

The Socio-Economic information presented below collectively applies to the solar PV Facilities, as well as the EGI (which is assessed as part of this BA) and the EGI assessed as part of this BA.

A.7.1 Employment during Construction

During the construction phase, both skilled and unskilled temporary employment opportunities will be created. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however, between 90 and 150 skilled and 400 and 460 unskilled employment opportunities are expected to be created during the construction phase per project. It should be noted that the employment opportunities provided in this report are estimates and is dependent on the final engineering design and the REIPPPP Request for Proposal provisions at that point in time.

A.7.2 Employment during Operations

Approximately 20 skilled and 40 unskilled employment opportunities will be created over the 20-year lifespan of the proposed facility, per project.

Employment opportunities to be created during the operational phase equate to approximately 4 800 person months (for skilled opportunities) and approximately 9 600 person months (for unskilled opportunities) per project over the 20-year plant lifespan.

A.8 Traffic Generation

The traffic information presented below collectively applies to the solar PV Facilities, as well as the EGI (which is assessed as part of this BA). However, as noted in the Traffic Impact Statement (Appendix J of this BA Report), the EGI component of the project is not expected to generate any significant traffic during operations.

As noted above, in terms of traffic generation, a Traffic Impact Statement, as technical input for this BA, has been commissioned and included in Appendix J of this BA Report. The types of materials and equipment that will need to be transported to site during the construction phase include the following:

- Building materials will be transported by single-unit trucks within the road freight limitations of South Africa;
- Solar panels, frames and inverters will be transported in 40-foot-long containers (which have exterior dimensions of 12.19 m long x 2.44 m wide x 2.59 m high) on double axle trucks within the road freight limitations of South Africa.
- Workers from the surrounding area will be transported by taxi/bus/shuttle or private car.
- Transformers will be transported by abnormal load trucks for which a permit will need to be applied for in terms of Section 81 of the National Road Traffic Act and authorisation needs to be obtained from the relevant road authorities to modify the road reserve to accommodate turning movements at intersections.

Based on a review of other Traffic Impact Statements for similar projects, it has been concluded that the number of vehicles estimated in the Draft BA Report was an over-estimation for the construction and decommissioning phases. The amended traffic **estimates** provided below, as extracted from the Traffic Impact Statement (Appendix I of this Final BA Report) are considered to now be more accurate. It is important to re-iterate that these numbers are only estimates. Ultimately, the Developer will maintain the access roads as per the EMPr and based on the requirements of the Western Cape Government Transport and Public Works - Roads Department.

During the construction, operational and decommissioning phases, the following number of daily trips per 175 MW solar PV plant have been calculated:

- **Construction Phase: Total 46 Daily Trips (i.e. in and out)**
  - 2 daily double-axle trucks (i.e. 4 trips) for the transportation of solar panels;
  - 20 daily light loads (i.e. 40 trips) for the transportation of construction materials and personnel; and
  - 1 daily water truck (i.e. 2 trips) for water requirements during the construction phase (i.e. 355 000 litres per month).

This results in an estimated 23 vehicles going to and from site on a daily basis during construction, resulting is 46 total daily in and out trips.

- **Operational Phase: Total 12 Daily Trips (i.e. in and out)**
  - 3 daily light load trucks (i.e. 6 trips) for the transportation of staff and equipment;
  - 1 daily single axle trucks (i.e. 2 trips) for the transportation of required materials during operations (conservative assumption as 1-2 small single-axle trucks will visit the site on a weekly basis); and
  - 2 daily water trucks (i.e. 4 trips) for water requirements during the operational phase (i.e. between 5 million and 8 million litres of water will be required for cleaning the solar panels and for potable water requirements per year).

This results in an estimated 6 vehicles going to and from site on a daily basis during operations, resulting is 12 total daily in and out trips.

- **Decommissioning Phase: 46 Daily Trips (i.e. in and out)**
  - 2 daily double-axle trucks (i.e. 4 trips) for the transportation of solar panels;
  - 20 daily light loads (i.e. 40 trips) for the transportation of materials and personnel; and
  - 1 daily water truck (i.e. 2 trips) for water requirements during the decommissioning phase (i.e. assumed at 355 000 litres per month).

This results in an estimated 23 vehicles going to and from site on a daily basis during decommissioning, resulting is 46 total daily in and out trips.

In a rural environment, the **peak hour trips** constitute approximately **20 % to 40 % of the daily traffic**. This relates to approximately **9 to 18** additional daily peak hour trips on the road network during the **construction and decommissioning phases;** and **2 to 5** additional daily peak hour trips on the road network during the **operational phase**, which will have an insignificant traffic impact on the surrounding road network. Furthermore, it must also be considered that even though a vehicle might travel to site during peak hour, it may only leave site during off-peak hours.

Refer to Figure A.8 for an illustration of the total number of daily trips for one 175 MW PV project, as well as the peak hour trips during the construction, operational and decommissioning phases.

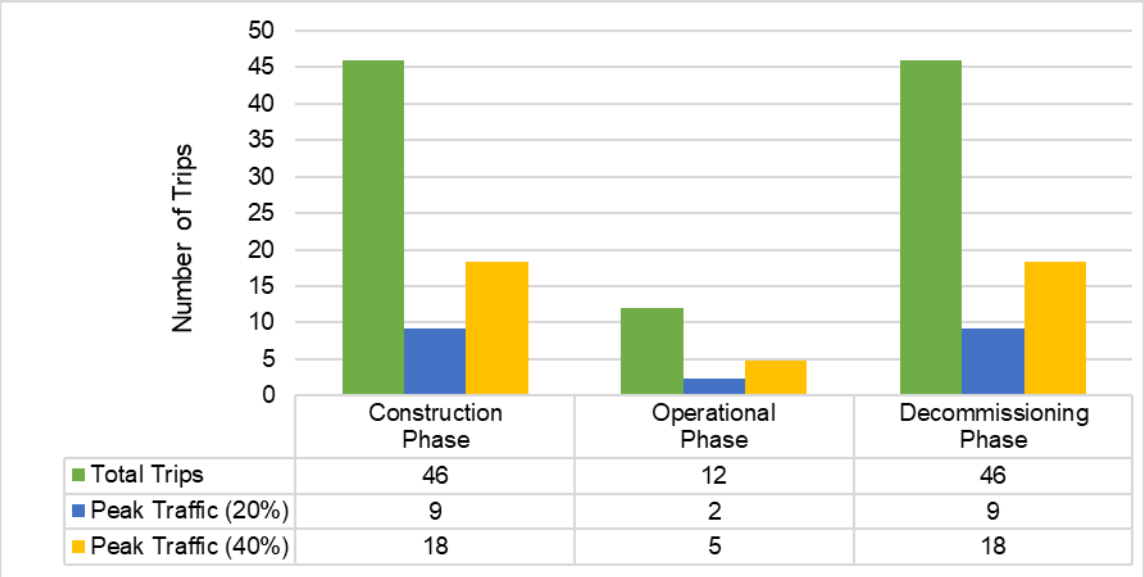


Figure A.8. Total Daily Trips for 1 * 175 MW PV Facility and associated infrastructure, and Peak Hour Trips

Refer to the Traffic Impact Statement included Appendix J of this BA Report for a complete description of the assumptions used in the trip calculations noted above. It is important to note that the Traffic Impact Statement has assumed the worst case construction period of 24 months, and has assumed that water will be trucked in from the municipality (in order to cater for potential traffic generation for water requirements). The section below provides a description of the water usage requirements.

A.9 Service Provision: Water Usage, Sewage, Solid Waste and Electricity Requirements

The Project Applicants have consulted with the Witzenberg Local Municipality in order to confirm the supply of services (in terms of water usage, sewage removal, solid waste removal, and electricity requirements) for each of the proposed projects. The municipality was also consulted with as part of the 30-day public review period of the Draft BA Report. The Project Applicant had received an email with feedback from the Witzenberg Local Municipality (Water and Sewerage Department) that confirms that water and sewerage services are available in the town of Ceres (not closer to the proposed project sites).

However, it must be noted that should the local municipality not have adequate capacity available in the future for any reason, for the handling of solar waste, provision of water and sewage handling provisions; then the Project Applicants will make use of private contractors to ensure that the services are provided. An outline of the services that will be required are discussed below.

The information presented below collectively applies to the solar PV Facilities, as well as the EGI (which is assessed as part of this BA).

A.9.1 Water Usage

During the construction phase, approximately 355 000 litres of water will be required per project per month. This equates to 4 260 000 litres of water per year per project during the construction phase. Water will be required for human consumption and construction activities. This is also classified as potable water and should be of a reputable source and conform to SANS quality standards. The decommissioning phase is also expected to result in the same water usage requirements.

During the operational phase, it is estimated that the panel washing process, and human consumption as well as other operational phase activities will require approximately 5 million to 8 million litres of water per year per project. Potable water is not available from an existing municipal infrastructure system and therefore needs to be sourced and imported and safely stored on site.

Water required for the construction, operational and decommissioning phases will either be sourced from the Witzenberg Local Municipality via trucks (as discussed above i.e. from Ceres) or from existing boreholes on site. Water will be stored on site in the vicinity of the O&M Building. It is anticipated that there will be 20 x 10 000 litre tanks on site to store the water during the construction and operational phases. As indicated above, the BA Process has addressed the aspect of trucking in water from the municipality to the proposed project sites (Refer to the Traffic Impact Statement in Appendix J of this Final BA Report), and has also considered utilising groundwater from existing boreholes on site (Refer to the desktop Geohydrology Assessment included in Appendix C.8 of the Final BA Report). The location of existing boreholes on the Farms Witte Wall, Grootfontein and Kareekolk are indicated in the Geohydrology Assessment. The respective landowners have provided in principle agreement for the developer to make use of their existing boreholes. Such correspondence is included in the Geohydrology Assessment.

The Geohydrology Assessment (Appendix C.8 of the BA Report) notes that all boreholes to be used for the proposed project should be tested prior to construction (after Environmental Authorisation is issued, should it be granted) to ensure their yield and quality meets necessary requirements. If groundwater is available and suitable, water pipelines may need to be constructed in order to transfer groundwater from the existing boreholes to the PV facilities. Refer to Section A.11 of this Final BA Report for additional feedback on such water pipelines. Groundwater will need to be stored on site in suitable containers or tanks during the construction and operational phases.

The Geohydrology Assessment (Appendix C.8 of the BA Report) notes that there is currently limited groundwater abstraction taking place in relation to the size of the study area (based on regional datasets). Groundwater is mostly used for drinking, agricultural purposes and livestock watering. The low rainfall and high evapotranspiration rates within the study area are a limiting factor for the recharge of the aquifer underlying the study area.

Based on available data and information gathered during the discussions with the landowners, the Geohydrology Assessment has noted that it is reasonable to conclude that the existing boreholes on the various land portions are sufficient to meet the water requirements of the PV Facilities in terms of volume. However, formal agreements will have to be put in place with the current landowners for the use of groundwater. These agreements will have to be legally valid documents and the necessary endorsements will be required from the Department of Human Settlements, Water and Sanitation (DHSWS).

Due to in principle agreement from the landowners, the need for additional boreholes to be drilled on the relevant farm portions is not required. However, if for any reason this is required, this will be

followed by yield and water quality testing, and then authorization from the DHSWS to use the groundwater (as a separate process). Refer to Sections B and D of this BA Report for additional information on the groundwater usage.

Storage tanks will also be allowed for at the on-site substation control room but this is localised small tanks for household use.

A.9.2 Sewage or Liquid Effluent

The proposed projects will require sewage services during the construction, operational and decommissioning phase. Low volumes of sewage or liquid effluent are estimated. More specifically, it is estimated that approximately 55 m^3 per month per project will be generated during the construction phase. During the operational phase, it is estimated that 3 m^3 per month per project will be generated.

Liquid effluent will be limited to the ablution facilities during the construction and operational phases. Portable sanitation facilities (i.e. chemical toilets) will be used during the construction phase, which will be regularly serviced and emptied by a suitable (private) contractor on a regular basis. Permanent ablution facilities may be installed during the operational phase. The effluent will be stored on site in watertight concrete structures (conservancy tanks) and thereafter transported to and disposed of at the Local Municipal sewerage treatment works. Due to the remote locality of the project sites, sewage cannot be disposed in the municipal waterborne sewage system.

A.9.3 Solid Waste Generation

The quantity of waste generated will depend on the construction phase, which is estimated to extend 12 to 14 months. However, it is estimated that approximately 12 m^3 of waste will be generated every month during the construction phase. During the construction phase, the following waste materials are expected:

- Packaging material, such as the cardboard, plastic and wooden packaging and off-cuts;
- Hazardous waste from empty tins, oils, soil containing oil and diesel (in the event of spills), and chemicals;
- Building rubble, discarded bricks, wood and concrete;
- Domestic waste generated by personnel; and
- Vegetation waste generated from the clearing of vegetation.

Solid waste will be managed via the EMPr during the construction and operational phases (Appendix G and Appendix H of the BA Report), which incorporates waste management principles. During the construction phase, general solid waste will be collected and temporarily stockpiled in skips in a designated area on site and thereafter removed, emptied into trucks, and disposed at a registered waste disposal facility on a monthly basis by an approved waste disposal Contractor (i.e. a suitable Contractor) or the municipality. A specialist waste management company will be commissioned to manage and dispose of this waste.

Any hazardous waste (such as contaminated soil as a result of spillages) will be temporarily stockpiled (for less than 90 days) in a designated area on site (i.e. placed in leak-proof storage skips), and thereafter removed off site by a suitable service provider for safe disposal at a registered hazardous waste disposal facility.

Waste disposal slips and waybills will be obtained for the collection and disposal of the general and hazardous waste. These disposal slips (i.e. safe disposal certificates) will be kept on file for auditing purposes as proof of disposal. The waste disposal facility selected will be suitable and able to receive the specified waste stream (i.e. hazardous waste will only be disposed of at a registered/licenced waste disposal facility). The details of the disposal facility will be finalised during the contracting process, prior to the commencement of construction. Where possible, recycling and re-use of material will be encouraged. Waste management is further discussed in the EMPr (Appendix G and Appendix H of this BA Report).

During the operational phase after construction, the facility will produce minor amounts of general waste (as a result of the offices). It is estimated that approximately 2.5 m^3 of waste will be generated every month during the operational phase. Waste management is discussed in the EMPr (Appendix G and Appendix H of this BA Report).

A.9.4 Electricity Requirements

In terms of electricity supply for the construction and operational phase, since there are no existing Eskom or municipal infrastructure supply services in the area, the developer will make use of generators on site during construction.

A.10 Applicable Legislation

The scope and content of this BA Report has been informed by the legislation, guidelines and information series documents listed in Table A.7. It is important to note that the specialist studies included in Appendix C of this BA Report also include a description of the relevant applicable legislation.

Table A.7. Legislation Applicable to the Proposed Projects

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
NEMA (Act 107 of 1998, as amended)	The proposed projects will require the implementation of appropriate environmental management practices.	National DEFF	19 November 1998
NEMA EIA Regulations published in GN R982, R983, R984 and R985 on 8 December 2014, and as amended on 7 April 2017 in GN R326, R327, R325 and R324	These Regulations provide the procedures that need to be followed for the BA Process.	National DEFF	8 December 2014 and amended on 7 April 2017
NEMA EIA Regulations published in Government Notice R983 and R985, and as amended on 7 April 2017 in GN R327, R325 and R324	These Regulations contain the relevant listed activities that are triggered, thus requiring a BA. Please refer to Section A (10) of this BA Report for the complete list of listed activities.	National DEFF	8 December 2014 and amended on 7 April 2017
GN 114 – Notice of identification in terms of section 24(5)(a) and (b) of the NEMA of the procedure to be followed in applying for EA for large scale wind and solar PV energy development activities identified in terms of section 24(2)(a) of the NEMA when occurring in geographical areas of strategic importance (i.e. REDZs)	The proposed projects fall within REDZ 2 and a BA process is therefore required.	National DEFF	16 February 2018
GN 960 – Notice of the requirement to submit a report generated by the National Web Based Environmental Screening Tool, in terms of Section 24(5)(h) of the NEMA and Regulation 16(1)(b)(v) of the 2014 NEMA EIA Regulations (as amended), when submitting an Application for EA in terms of Regulations 19 and 21 of the 2014 NEMA EIA Regulations (as amended)	GN 960 was published on 5 July 2019 and came into effect for compulsory use of the National Web Based Environmental Screening Tool from 4 October 2019. As such, the Applications for EA for the proposed projects have been run through the National Web Based Environmental Screening Tool, and associated reports generated and attached to the Applications for EA.	National DEFF	5 July 2019
GN 320 - Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA, when applying for EA	GN 320 prescribes general requirements for undertaking site sensitivity verification and for protocols for the assessment and minimum report content requirements of environmental impacts for environmental themes for activities requiring EA. The Specialist Assessments undertaken as part of this BA Process comply with GN 320, where applicable, such as the Aquatic Biodiversity and Species, Terrestrial Biodiversity and Species, and Agriculture. The Civil Aviation Site Sensitivity Verification complies with GN 320. The remaining specialist studies comply with Part A of GN 320, which contains site sensitivity verification requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed. The protocols were enforced within 50	National DEFF	20 March 2020

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	days of publication of the notice i.e. on 9 May 2020.		
GN 1150 - Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the NEMA, when applying for EA	GN 1150 prescribes protocols in respect of specific environmental themes for the assessment of, as well as the minimum report content requirements on, the environmental impacts for activities requiring EA. GN 1150 includes a protocol for the specialist assessment and minimum report content requirements for environmental impacts on a) terrestrial animal species and b) terrestrial plant species. The requirements of these protocols apply from the date of publication (i.e. from 30 October 2020), except where the Project Applicant provides proof to the competent authority that the specialist assessment affected by these protocols had been commissioned by the date of publication of these protocols in the Government Gazette, in which case Appendix 6 of the 2014 NEMA EIA Regulations will apply to such applications. It is important to note that the Specialist Assessments undertaken as part of this BA Process were commissioned prior to the publication of the Species Protocols published on 30 October 2020. The Specialist Assessments were commissioned in August 2020, and as such comply with Appendix 6 of the 2014 EIA Regulations (as amended) or GN 320 (as described above). Details of the specialist site visits (as applicable) undertaken prior to 30 October 2020 is detailed in Appendix C. Contractual proof showing appointments of the specialists prior to 30 October 2020 will be provided to the Competent Authority when the Draft BA Reports and Application Forms for EA were submitted.	National DEFF	30 October 2020
National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA)	General and hazardous waste will be generated during the construction phase, which will require proper management. Such management actions are recommended in the Environmental Management Programme (EMPr), which are included in Appendix G and Appendix H of this BA Report.	National DEFF	6 March 2009
		National DEFF	2 June 2014
National Environmental Management: Air Quality Act (Act 39 of 2004)	The proposed stockpiling activities, including earthworks, may result in the unsettling of, and temporary exposure to, dust. Appropriate dust control methods will need to be	National DEFF	19 February 2005

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	applied. Such management actions are recommended in the EMPr, which are included in Appendix G and Appendix H of this BA Report.		
Water Services Act (Act 108 of 1997)	Water will be required during the construction, operational and decommissioning phases of the proposed projects, for consumption purposes, earthworks and grassing etc. Water will either be sourced from the local municipality or from existing boreholes in the vicinity of the proposed projects. Compliance with this act will be undertaken during the relevant phase of the project, in consultation with the local and district municipalities, if relevant (i.e. if water is sourced from the local municipality).	National Department of Water Affairs	1997
Hazardous Substances Act (Act 15 of 1973)	During the proposed projects, fuel and diesel will be utilised to power vehicles and equipment (i.e. via a diesel generator). The generator might also be used for power on site during power outages, normal power etc. In addition, potential spills of hazardous materials could occur during the relevant phases. Such management actions are recommended in the EMPr, which are included in Appendix G and Appendix H of this BA Report.	Department of Health	1973
National Forests Act (Act 84 of 1998)	Protected Tree species are listed under the National Forests Act (Act 84 of 1998, as amended). In terms of section 15(1) of the act, no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a license granted by the Minister. The Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) notes that clearance of "natural forest" may be applicable, where, particularly in the establishment of the power line that traverses the Groot River, there may be the requirement to remove associations of *V. karroo*. Although not strictly "forest" in ecological terms, the contiguous canopy definition of forest would apply under Section 7 of the National Forest Act (Act 84 of 1998).	DAFF	1998

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	If any protected species are found on site during the search and rescue or construction, the Provincial Department of Agriculture, Forestry and Fisheries will be contacted to discuss the permitting requirements.		
National Water Act (NWA) (Act 36 of 1998)	Wetlands or riparian zones are excluded from developments unless these developments are authorised by the Department of Human Settlements, Water and Sanitation (DHSWS) for water uses which are defined in Section 21(c) or Section 21 (i). General Authorisation applies in terms of Section 39 of the National Water Act (Act 36 of 1998) for water uses as defined in Section 21(c) or Section 21(i) of the Act (Department of Water and Sanitation, GN 509 of 2016). This General Authorisation replaces the need for a water user to apply for a licence in terms of the National Water Act (Act 36 of 1998) provided that the water use is within limits and conditions of this General Authorisation. A General Authorisation does not apply to any development within a distance of 500 m upstream or downstream from the boundary (outer edge) of any wetland (GN 1199, Government Gazette 32805 of 2009; Replacement General Authorisation in terms of Section 39 of the National Water Act). The National Water Act controls activities in and around water resources, as well as the general management of water resources, including abstraction of groundwater and disposal of water. Authorisation for changes in land use, up to 500 m from a defined water resource / wetland system will require at the minimum the compilation of a risk assessment and depending upon outcome, an application for use under a General Authorisation or a Water Use Licence from the DHSWS. The Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) notes that the requirement for a General Authorisation or Water Use License may require a hydro-pedological assessment of the terrestrial	Department of Water and Sanitation	1998

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	component of the site as part of this application. It is however noted that a significant "buffer" is applicable to the riparian edge. Refer to Appendix C.4 of the BA Report for additional information. The requirement for a General Authorisation or Water Use License in terms of Section 21 (c) and 21 (i) of the National Water Act may be required where activities arise within the bed of the river in respect of the road upgrading. The power line crossings of the watercourses on site likely require a Water Use License or similarly a General Authorisation (the pylon placement will be confirmed during detailed design). The DHSWS provided comment on the Draft BA Reports, as indicated in Appendix D of this BA Report. The DHSWS will be contacted prior to construction to confirm if a Water Use License or similarly a General Authorisation is required, and the necessary applications will be applied for prior to the commencement of construction. Both surface and groundwater sources are redefined by the Act as national resources which cannot be owned by any individual, and rights to which are not automatically coupled to land rights, but for which prospective users must apply for authorization and register as users. The National Water Act also provides for measures to prevent, control and remedy the pollution of surface and groundwater sources. The Geohydrology Assessment (Appendix C.8 of the BA Report) notes that only a registration process will have to be followed for the groundwater use (via existing boreholes); i.e. Section 39 of the National Water Act (Act 36 of 1998) is applicable. The abstraction of groundwater will need to meet other GA requirements for the abstraction of water from a borehole.		
Integrated Environmental Management (IEM) guideline series published by DEFF (various documents dated from 2002 to present)	The IEM Guideline series provides guidance on conducting and managing all phases and components of the required BA and PPP, such that all associated tasks are performed in	National DEFF	2002 - present

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	the most suitable manner. Relevant guidelines have been considered in this BA Process.		
National Heritage Resources Act (Act 25 of 1999)	The proposed project may require a permit in terms of the National Heritage Resources Act (Act 25 of 1999) prior to any fossils or artefacts being removed by professional palaeontologists and archaeologists. If archaeological mitigation is needed, then the appointed archaeologist will need to submit a Work Plan to Heritage Western Cape (HWC) to do the work. This must be carried out well in advance of construction to ensure that there is enough time for HWC to approve the mitigation work before construction commences. Should professional palaeontological mitigation be necessary during the construction phase, the palaeontologist concerned will need to apply for a Fossil Collection Permit from HWC. Palaeontological collection should comply with international best practice. All fossil material collected must be deposited, together with key collection data, in an approved depository (museum / university). Palaeontological mitigation work including the ensuing Fossil Collection reports should comply with the minimum standards specified by Heritage Western Cape (2016) and SAHRA (2013). Additional information regarding this is provided in the Heritage Impact Assessment and Palaeontological Impact Assessment (Appendix C of the BA Report).	National Department of Arts and Culture	1999
Conservation of Agricultural Resources Act (Act 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) has categorised a large number of invasive plants together with associated obligations of the land owner. Invasive plant species that should be removed or maintained only under certain commercial situations are identified in terms of the CARA.	National Department of Agriculture	1983

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	Notably most listed alien invasive species are propagated and driven by the disturbance of land during and following construction. Rehabilitation after disturbance to agricultural land is managed by the CARA. No application is required in terms of CARA. The BA Processes cover the required aspects of this.		
National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended)	This Act serves to control the disturbance and land utilisation within certain habitats, as well as the planting and control of certain exotic species. Effective disturbance and removal of threatened or protected species encountered on or around the sites, will require specific permission from the applicable authorities. In addition, the management of exotic plant species, will be governed by the Alien and Invasive Species (AIS) regulations, which were gazetted in 2014. These regulations compel landowners to manage exotic weeds on land under their jurisdiction and control. In addition, the most prominent statute containing provisions directly aimed at the conservation of birds is the National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) read with the Threatened or Protected Species Regulations, February 2007 (TOPS Regulations). Chapter 1 sets out the objectives of the Act, and they are aligned with the objectives of the Convention on Biological Diversity, which are the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the use of genetic resources. The Act also gives effect to CITES, the Ramsar Convention, and the Bonn Convention on Migratory Species of Wild Animals. The State is endowed with the trusteeship of biodiversity and has the responsibility to manage, conserve and sustain the biodiversity of South Africa.	National DEFF	September 2004
Subdivision of Agricultural Land Act (Act 70 of 1970)	The Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA) requires that any long term lease associated with the	Republic of South Africa	1970

Title of legislation, policy or guideline	Applicability to the Proposed Projects	Administering Authority	Date
	renewable energy facility be approved by the Department of Agriculture, Land Reform and Rural Development (DALRRD). The SALA consent is separate from the Application for EA, and needs to be applied for and obtained separately. An application for the change of land use (re-zoning) for the development on agricultural land will be lodged by the Applicant for approval in terms of the SALA as required.		
The Cape Nature and Environmental Conservation Ordinance 19 of 1974 and the Western Cape Nature Conservation Laws Amendment Act (2000)	This act should be given consideration following EA with particular respect to Chapters IV (The protection of wild animals other than fish) and Chapter VI (The protection of flora). The requirement for permits when removing and relocating specific flora that may be encountered or alternatively addressing fauna that may be encountered around the sites would require due consideration. The Western Cape Nature Conservation Laws Amendment Act (2000) provides for the amendment of various laws on nature conservation in order to transfer the administration of the provisions of those laws to the Western Cape Nature Conservation Board, which includes various regulations pertaining to wild animals, including avifauna.	Western Cape Province	1974 and 2000
Draft Western Cape Biodiversity Bill, 2019	The purpose of the Draft Western Cape Biodiversity Bill, 2019 is to provide for the framework and institutions for nature conservation and the protection, management and sustainable use of biodiversity and ecosystems in the Province; and for matters incidental thereto. This law has not been promulgated however some aspects of Chapter 7 (Protection of Ecosystems, Ecological Infrastructure and Species), in particular, may apply to the sites, once promulgated.	Western Cape Province	7 May 2019

A.11 Listed Activities Associated with the Proposed Projects

Section 24(1) of the NEMA states: "*In order to give effect to the general objectives of integrated environmental management laid down in this Chapter, the potential impact on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority charged by this Act with granting the relevant environmental authorization*".

The reference to "listed activities" in Section 24 of the NEMA relates to the regulations promulgated in GN R326, R327, R325 and R324, dated 7 April 2017. The relevant GN published in terms of the NEMA collectively comprise the NEMA EIA Regulations listed activities that require either a BA, or Scoping and EIA be conducted. As noted previously, due to the projects being proposed in a REDZ, the proposed projects require a BA Process.

The combined Application for EA for this BA Process was submitted to the DEFF together with the Draft BA Report, which makes reference to all relevant listed activities forming part of the proposed developments.

As part of the 30-day review on the Draft BA Report, the DEFF provided the following comments:

- *"Please ensure that all relevant listed activities are applied for, are specific and can be linked to the development activity or infrastructure as described in the project description. Only activities applicable to the development must be applied for and assessed".*

Furthermore, the Western Cape Department of Environmental Affairs and Development Planning (WC DEADP) provided the following comments on the Draft BA Report:

- *"The proposed solar PV facilities will be located within two vegetation types, namely Tanqua Karoo and Tanqua Wash Riviere. Both vegetation types are listed as having an ecosystem status of Least Threatened in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) National List of Ecosystems that are Threatened and in Need of Protection dated 09 December 2011. Activity 12.i.ii of Listing Notice 3 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") Environmental Impact Assessment ("EIA") Regulations, 2014 (as amended) has been included as part of the listed activities triggered, since "minor areas of Critical Biodiversity Area (CBA) and Ecological Support Area (ESA) in terms of the Western Cape Biodiversity Spatial Plan (2017)" will be impacted upon by the proposed development. Please be advised that no bioregional plan has been adopted by the competent authority for the Western Cape geographical area. Therefore, unless indigenous vegetation of 300m^2 or more within in a critically endangered or an endangered ecosystem is removed, Activity 12 of Listing Notice 3 of the NEMA EIA Regulations, 2014 (as amended) will not be applicable to the proposed development.*
- *Similarly, it is noted that Activity 14 of Listing Notice 3 of the NEMA EIA Regulations, 2014 (as amended) has been included as part of the applicable listed activities. Although the proposed development site is located outside an urban area, none of the specific triggers for the Western Cape listed in Activity 14.i.i (aa) to (hh) are applicable, and the mentioned activity should therefore not be included as part of the development proposal".*

Based on the above comments, the listed activities originally included in the Draft BA Report and Application Form for EA have been reconsidered, as discussed below.

Based on feedback from the WC DEADP, the following listed activity does not apply to the proposed project. The Terrestrial Biodiversity Assessment (Appendix C.4 of this Final BA Report) states that there are no Critically Endangered and Threatened Ecosystems within the study sites. The WC DEADP explains in their comment that a bioregional plan has not been adopted by the competent authority for the Western Cape geographical area. However, even though the bioregional plan has not been formally adopted by the Competent Authority, this BA Process has still assessed the impact of the proposed projects on Critical Biodiversity Areas and Ecological Support Areas in terms of the Western Cape Biodiversity Spatial Plan (2017). The following listed activity is no longer applicable and has been removed from the Application Form for EA:

- GN R324: Activity 12 (i) (ii): The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (i) Western Cape; (ii) Within critical biodiversity areas identified in bioregional plans.

Based on feedback from the WC DEADP, the following listed activity does not apply to the proposed project. The WC DEADP notes that none of the specific triggers for the Western Cape listed in Activity 14.i.i (aa) to (hh) are applicable to the proposed project. However, even though the bioregional plan has not been formally adopted by the Competent Authority, this BA Process has still assessed the impact of the proposed projects on Critical Biodiversity Areas and Ecological Support Areas in terms of the Western Cape Biodiversity Spatial Plan (2017). The following listed activity is no longer applicable and has been removed from the Application Form for EA:

- GN R324: Activity 14 (ii) (a) and (c); (i), (i) and (ff): The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs – (a) within a watercourse; (b) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; i. Western Cape; i. Outside urban areas: (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

The above listed activities that are no longer applicable to the proposed project have been removed from the Application Form for EA. An amended application form has been submitted to the Competent Authority with the Final BA Report.

Table A.8 below provides a list of the applicable listed activities associated for the proposed project in terms of Listing Notice 1 (GN R 327), and Listing Notice 3 (GN R324) in terms of the 2014 NEMA EIA Regulations (as amended). Refer to the separate BA Reports for the PV Facilities for an indication of the listed activities triggered by the PV project components. **Table A.8 only applies to the listed activities relevant to the EGI**.

Table A.8. Applicable Listed Activities

Listed activity as described in GN R 327, 325 and 324	Description of project activity that triggers listed activity
GN R327: Activity 11 (i): The development of facilities or infrastructure for the transmission and distribution of electricity - (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	The proposed projects will entail the construction and installation of nine on-site substations and/or switching stations, one at each PV facility. The on-site substations referred to here are specifically for the section that will potentially be managed by Eskom i.e. this includes the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substations, planned to be 132 kV) up to the line bay at the Eskom Kappa Substation. Furthermore, the proposed projects will include the construction of nine power lines of approximately 132 KV routed from the on-site substations at each PV Facility to the Eskom Kappa Substation. The estimated power line lengths are specified below: • Witte Wall PV 1 Power Line: Approximately 19 km; • Witte Wall PV 2 Power Line: Approximately 21 km; • Grootfontein PV 1 Power Line: Approximately 22 km; • Grootfontein PV 2 Power Line: Approximately 23 km; • Grootfontein PV 3 Power Line: Approximately 23 km; • Hoek Doornen PV 1 Power Line: Approximately 18 km; • Hoek Doornen PV 2 Power Line: Approximately 20 km; • Hoek Doornen PV 3 Power Line: Approximately 21 km; and • Hoek Doornen PV 4 Power Line: Approximately 18 km. This constitutes facilities for the distribution and transmission of electricity. The proposed projects will take place outside of an urban area, approximately 90 km from Ceres and 70 km from Touws River, within the Witzenberg Local Municipality, Cape Winelands District Municipality, Western Cape Province.
GN R327: Activity 12 (ii) (a) (c): The development of: (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs-	The proposed projects will take place approximately 90 km from Ceres and 70 km from Touws River, within the Witzenberg Local Municipality, Cape Winelands District Municipality, Western Cape Province. Hence the proposed project will take place outside of an urban area.

Listed activity as described in GN R 327, 325 and 324	Description of project activity that triggers listed activity
a) within a watercourse; b) in front of a development setback; or c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	The proposed projects will entail the construction of building infrastructure and structures for the on-site substations (extending from the Point of Connection), as well as the power lines (including pylons and associated infrastructure) and service roads. The infrastructure and structures are expected to exceed a footprint of 100 m^2 and some may occur within small drainage features and 32 m of the watercourses. The Farms Witte Wall and Hoek Doornen incorporate portions of two river systems, namely the Klein Droëlaagte, in the north and the Groot River in the south. A small unnamed river system also flows through the farm and has its confluence with the Groot River on the Farm Witte Wall. The Grootfontein Farm portions contain the Droëlaagte and Klein Droëlaagte Rivers.
GN R327: Activity 19: The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving- a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	The proposed projects may entail the excavation, removal and moving of more than 10 m^3 of soil, sand, pebbles or rock from nearby watercourses on site. The proposed project may also entail the infilling of more than 10 m^3 of material into the nearby watercourses. The Groot River, Klein Droëlaagte and Droëlaagte Rivers run through some of the affected farm portions. Due to the width of the Groot River, pylon bases will need to be constructed within the dry river bed and banks of the Groot River. The details of the pylon placement will be confirmed during the detailed design phase. This listed activity is therefore considered relevant.
GN R327: Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	The proposed projects will entail the construction of nine on-site substations and/or switching substations (each with an estimated footprint of 2 ha). This will constitute infrastructure with a physical footprint of more than 1 ha that will require clearance of indigenous vegetation.

Listed activity as described in GN R 327, 325 and 324	Description of project activity that triggers listed activity
	The on-site substations referred to here are specifically for the section that will potentially be managed by Eskom i.e. this includes the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substations, planned to be 132 kV) up to the line bay at the Eskom Kappa Substation.
GN R327: Activity 28 (ii): Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.	The proposed projects will be constructed approximately 90 km from Ceres and 70 km from Touws River, within the Witzenberg Local Municipality, Cape Winelands District Municipality, Western Cape Province. Hence the proposed project will take place outside of an urban area. In addition, the Witte Wall Farm currently has game on it. The proposed projects will entail the construction of nine on-site substations and/or switching substations (each with an estimated footprint of 2 ha). This will constitute infrastructure with a physical footprint of more than 1 ha. The on-site substations referred to here are specifically for the section that will potentially be managed by Eskom i.e. this includes the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substations, planned to be 132 kV) up to the line bay at the Eskom Kappa Substation.
GN R327: Activity 47: The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	The proposed project will also include associated electrical infrastructure at the Eskom Kappa Substation (including but not limited to feeders, Busbars, new transformer bay (up to 500 MVA) and extension to the platform at the Eskom Kappa Substation).
GN R324: Activity 4 (i) (ii) (aa): The development of a road wider than 4 metres with a reserve less than 13,5 metres. (i) Western Cape (ii) Areas outside urban areas; (aa) Areas containing indigenous vegetation	The proposed projects will be constructed approximately 90 km from Ceres and 70 km from Touws River, within the Witzenberg Local Municipality, Cape Winelands District Municipality, Western Cape Province. Hence the proposed project will take place outside of an urban area. The proposed projects will take place on land containing indigenous vegetation. As noted above, gravel service roads will be constructed below the power lines, which will extend approximately 4 m wide.

A.12 National Web-Based Environmental Screening Tool

As noted above, GN 960 (dated 5 July 2019) published a notice of the requirement to submit a report generated by the National Web Based Environmental Screening Tool, in terms of Section 24(5)(h) of the NEMA and Regulation 16(1)(b)(v) of the 2014 NEMA EIA Regulations (as amended), when submitting an Application for EA in terms of Regulations 19 and 21 of the 2014 NEMA EIA Regulations (as amended). GN 960 came into effect for compulsory use of the National Web Based Environmental Screening Tool from 4 October 2019. As such, the Applications for EA for the proposed projects have been run through the National Web Based Environmental Screening Tool, and associated reports generated and attached to the combined Applications for EA.

Based on the selected classification, the National Web Based Environmental Screening Tool provides a list of specialist studies that should be undertaken as part of the BA Process, as well as identifies the sensitivities on site that need to be verified by either the EAP or the specialists, where relevant, as noted in the Assessment Protocols of 20 March 2020 (GN 320). The classification that applies to the proposed projects is **Utilities Infrastructure; Electricity; Generation; Renewable; Solar; PV; and Solar PV**.

The following list of Specialist Assessments have been identified by the National Web Based Environmental Screening Tool for inclusion in the BA Report (Table A.9). The National Web Based Environmental Screening Tool Report notes that it is the responsibility of the EAP to confirm this list and to motivate in the BA Report, the reason for not including any of the identified specialist studies.

Table A.9. List of Specialist Assessments identified by the Screening Tool

	Specialist Study Required by the Screening Tool	Assessment undertaken in BA	Type of Assessment undertaken in BA	Appendix of BA Report
1	Agriculture and Soils	Yes	Protocol GN 320: Compliance Statement	C.1
2	Landscape / Visual Impact Assessment	Yes	Appendix 6: Impact Assessment	C.2
3	Archaeological and Cultural Heritage Impact Assessment	Yes	Appendix 6: Impact Assessment (In line with HWC requirements, an integrated Heritage Impact Assessment including Archaeology, Cultural Landscape and Palaeontology has been undertaken. This is in line with previous reporting requirements in the Western Cape as well. Refer to Appendix C.3 of this Final BA Report. Approval was obtained from Heritage Western Cape, as described in Section C of this Final BA Report, and captured in Appendix D.	C.3
4	Palaeontology Impact Assessment			
5	Terrestrial Biodiversity Impact Assessment	Yes	Protocol GN320: Impact Assessment. The Terrestrial Biodiversity Impact Assessment includes feedback on Terrestrial Plant and Animal Species. This study was undertaken and commissioned prior to the Species Protocol published on GN 1150 dated 30 October 2020 (as discussed above in Section A.10). The study undertaken as part of the BA is referred to as Terrestrial Biodiversity and Species.	C.4
6	Plant Species Assessment			
7	Animal Species Assessment			
8	Aquatic Biodiversity Impact Assessment	Yes	Protocol GN320: Impact Assessment. The study undertaken as part of the BA is referred to as Aquatic Biodiversity and Species. Note there is no Species Protocol published yet for	C.5

	Specialist Study Required by the Screening Tool	Assessment undertaken in BA	Type of Assessment undertaken in BA	Appendix of BA Report
			Aquatic Plants and Animals.	
9	Avian Impact Assessment	Yes	Appendix 6: Impact Assessment	C.6
10	Socio-Economic Assessment	Yes	Appendix 6: Impact Assessment	C.7
11	Civil Aviation Assessment	Yes	Protocol GN 320: Site Sensitivity Verification (No requirements for low sensitivity in terms of GN 320)	C.9
13	RFI Assessment	No	Motivation not to undertake a specialist assessment. This motivation was discussed and approved by the DEFF at the pre-application meeting that took place on 25 August 2020. Refer to the motivation provided below.	N/A
14	Geotechnical Assessment	No	Motivation not to undertake a specialist assessment. This motivation was discussed and approved by the DEFF at the pre-application meeting that took place on 25 August 2020. Refer to the motivation provided below.	N/A

It must however be noted that the Screening Tool did not identify the need for a Geohydrology Assessment, however this has been undertaken as part of the BA Process in order to consider and assess the impact of potentially using groundwater during the construction and operational phases.

It must also be noted that a Traffic Impact Assessment was not identified as a requirement by the Screening Tool. Traffic Impacts are not significant for the proposed project, however to ensure that this impact is considered holistically and to ensure that suitable management actions are recommended, the Applicant, commissioned a ***technical*** Traffic Impact Statement to inform the BA Process. The Traffic Impact Statement is included in Appendix J of this BA Report, and since it is not required by the Screening Tool, nor are significant traffic impacts predicted (as indicated in Section D of this BA Report), the statement itself does not comply with the requirements of Appendix 6 of the 2014 NEMA EIA Regulations (as amended), and strictly serves as technical input to inform the BA. The DEFF also confirmed via approval of the notes of the pre-application meeting that took place on 25 August 2020 (as included in Appendix I of this BA Report), that in instances where impacts are not expected to be significant, the EAP is able to identify such impacts independently without commissioning a dedicated specialist study i.e. if the impacts are not significant enough to warrant a specialist study, they can still be assessed and mitigation recommended by the EAP within the main BA report itself. Therefore, this is in line with the requirements and expectations of the DEFF and provides motivation towards the Applicant's commitment to ensuring environmental impacts are reduced and mitigated, where possible.

A.12.1 Square Kilometre Array and Radio Frequency Interference

The Astronomy Geographic Advantage (AGA) Act (Act 21 of 2007) aims to provide for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy; to provide for intergovernmental co-operation and public consultation on matters concerning nationally significant astronomy advantage areas; and to provide for matters connected therewith. The purpose of the AGA Act is to preserve the geographic advantage areas that attract investment in astronomy. The AGA Act also notes that declared astronomy advantage areas are to be protected and properly maintained in terms of Radio Frequency Interference (RFI). The AGA Act is

administered by the Department of Higher Education, Science and Technology (previously the Department of Science and Technology).

According to the CSIR Wind and Solar Phase 2 SEA (DEFF, 2019: Part 3, Page 2), the majority of the mid-frequency dish array of the Square Kilometre Array (SKA) will be constructed in the core which is in located in the Northern Cape; with dish antennas being located in the spiral arms. The South African component of the SKA will consist of approximately 3 000 receptors comprising dish antennas, each with a diameter of 15 m, and radio receptors known as dense aperture-arrays. The outer stations in the spiral arms will extend beyond the borders of South Africa and at least 3 000 km from the core area. About 80% of the receptors, including a dense core and up to five spiral arms, will be located in the Karoo Central Astronomy Advantage Area (KCAAA) (DEFF, 2019: Part 3, Page 2).

The KCAAA, which is located between Brandvlei, Van Wyksvlei, Carnarvon and Williston in the Northern Cape Province, was officially declared in 2014 by the Minister of Science and Technology in terms of the AGA Act for the purposes of protection RFI and Electromagnetic Interference (EMI). The declaration of the KCAAA ensures the longterm viability of the area to be used for astronomical installations (DEFF, 2019: Part 3, Page 2).

PV installations are known to have unintentional radiated emissions from electrical and electronic equipment that have the potential to interfere with the SKA Radio Telescope project in the Northern Cape. This can result in interference to celestial observations and/or data loss. Such interference is typically referred to as RFI (DEFF, 2019: Part 3, Page 2).

The location of the proposed projects does not pose an EMI or RFI risk to the SKA, as the proposed projects are located outside of the Northern Cape and outside of the KCAAA. Refer to Figure A.9 for the location of the proposed project in relation to the SKA and KCAAA. Furthermore, based on the findings of the Wind and Solar Phase 1 SEA (DEA, 2015), the proposed project sites fall within an area of low sensitivity in terms of SKA sensitivity for the development of solar PV energy. This also aligns with the findings of the Screening Tool (i.e. the proposed project sites fall within a low sensitivity in terms of the relative RFI theme sensitivity).

During the pre-application meeting undertaken on 25 August 2020, it was explained that it is not intended to commission a RFI study for the proposed project due to the location of the proposed projects being in the Western Cape and far away from the SKA and KCAAA; the findings of the Screening Tool and the findings of the Wind and Solar Phase 1 SEA (DEA, 2015). This motivation for exclusion was acknowledged and approved by the DEFF during the pre-application meeting, with the recommendation for such motivation to also be included in the BA Report. All correspondence relating to the pre-application meeting is addressed in Appendix I of this BA Report.

Furthermore, the SKA is on the project I&AP database as a key stakeholder, and was informed of the availability of the Draft BA Report for a 30-day comment period. Follow up emails were sent to the SKA to request comments, as captured in Appendix D of this BA Report. The South African Radio Astronomy Observatory (SARAO) confirmed in a letter dated 2 February 2021 that the proposed projects do not negatively impact the SKA through the anticipated radiation of electromagnetic emissions, and that the proposed projects are located outside the KCAAA and does not exceed the protection level of -226.61 dBm/Hz at the various SKA telescopes. Therefore, the SARAO considers the proposed projects to be of low risk and does not anticipate that there will be a detrimental impact on the SKA.

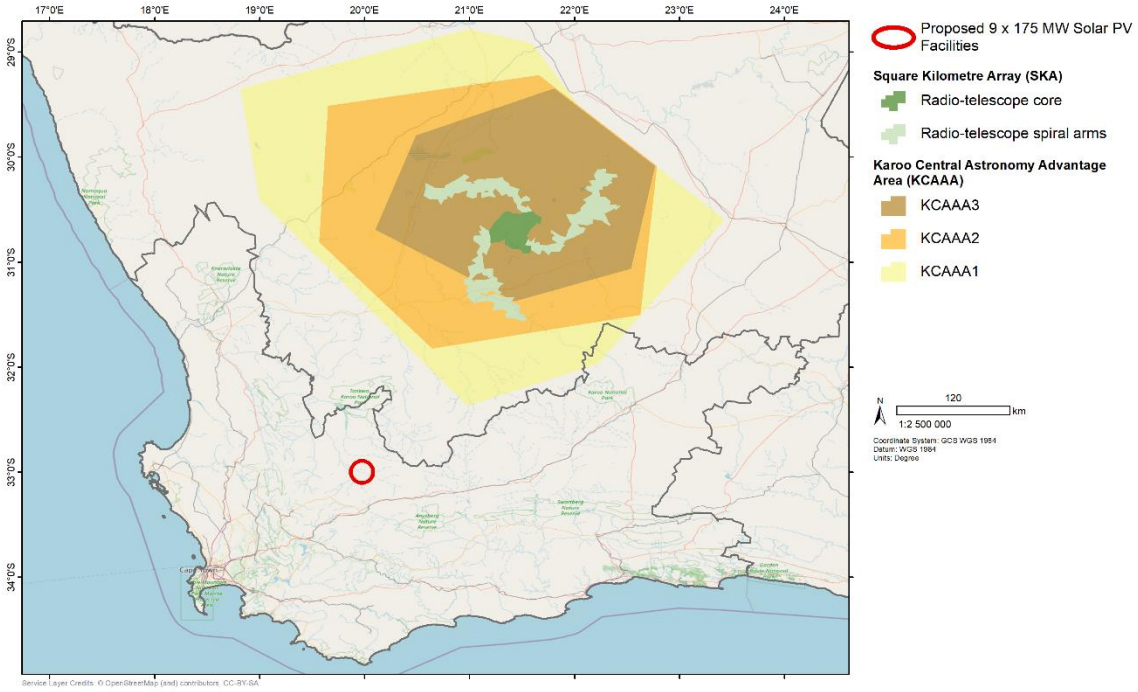


Figure A.9. Location of the proposed projects in relation to the SKA and KCAAA

A.12.2 Geotechnical Assessment

The National Web-based Environmental Screening Tool also identified the need for a Geotechnical Assessment. A Geotechnical Assessment has not been undertaken as part of the BA Process as this will be undertaken during the detailed design phase, once preferred bidder status is obtained in terms of the REIPPPP or similar processes. Contractors and suppliers will only be selected and appointed after preferred bidder status is obtained (should it be granted). In line with best practice, and to ensure that all aspects are covered in the assessment, suppliers of sub-structures, inverters and transformers and civil sub-contractors are required to provide input into the scope of work of the Geotechnical Assessment. Therefore, Geotechnical Assessments can only be undertaken during detailed design, if preferred bidder status is obtained.

This motivation for exclusion was acknowledged and approved by the DEFF during the pre-application meeting, with the recommendation for such motivation to also be included in the BA Report. All correspondence relating to the pre-application meeting is addressed in Appendix I of this BA Report.

A.13 Description of Alternatives

This section discusses the alternatives that have been considered as part of the BA Process. Sections 24(4) (b) (i) and 24(4A) of the NEMA require an Environmental Assessment to include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24O (1)(b)(iv) also requires that the Competent Authority, when considering an application for EA, takes into account "where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment".

Therefore, the assessment of alternatives should, as a minimum, include the following:

- The consideration of the no-go alternative as a baseline scenario;
- A comparison of the reasonable and feasible alternatives; and
- Providing a methodology for the elimination of an alternative.

The 2014 NEMA EIA Regulations (as amended) defines alternatives, in relation to a proposed activity, as "different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- property on which or location where the activity is proposed to be undertaken;
- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity;
- operational aspects of the activity; or
- and includes the option of not implementing the activity";

Regulation 2 (e) of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) states that one of the objectives of the BA Process is to, through a consultative process, and through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to (i) identify and motivate a preferred site, activity and technology alternative; (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and (iii) identify residual risks that need to be managed and monitored.

It must be noted that the EGI is inherently linked to the proposed Solar PV Facilities, and as such, the similar discussion around alternatives applies.

A.13.1 No-go Alternative

The no-go alternative assumes that the proposed projects will not go ahead i.e. it is the option of not constructing the proposed solar PV facilities, EGI and associated infrastructure. This alternative would result in no environmental impacts on the site or surrounding local area as a result of the proposed projects. It provides the baseline against which other alternatives are compared and is considered throughout the report.

The following implications will occur if the "no-go" alternative is implemented (i.e. the proposed project does not proceed):

- No benefits will be derived from the implementation of an additional land-use;
- No additional power will be generated or supplied through means of renewable energy resources by this project at this location;
- The "no go" alternative will not contribute to and assist the government in achieving its renewable energy target of 26 630 MW total installed capacity by 2030 (for Wind, Solar PV and Concentrated Solar Power);
- Electricity generation will remain constant (i.e. no renewable energy generation will occur on the site for the proposed projects) and the local economy in terms of surrounding communities (i.e. Ceres Karoo) and towns within the local municipality will not be diversified;
- There will be lost opportunity for skills transfer and education/training of local communities;
- The positive socio-economic impacts likely to result from the project such as increased local spending and the creation of local employment opportunities will not be realised;
- There will be no opportunity for additional employment in an area, where job creation is identified as a key priority;
- The local economic benefits associated with the REIPPPP will not be realised, and socio-economic contribution payments into the local community trust will not be realise;
- The development of solar PV facilities instead of coal fired power stations can directly contribute to South Africa's response to climate mitigation; and
- Wind and solar energy are the cheapest source of electricity in South Africa. The development of the proposed Solar PV Facilities can contribute to the competitive nature of the REIPPPP to drive prices down even further to ensure that South Africans have access to affordable yet clean electricity.

Converse to the above, the following benefits could occur if the "no-go" alternative is implemented:

- No vegetation or species of special concern (flora and fauna) will be removed or disturbed during the development of the proposed projects;
- No aquatic resources will be impacted upon during the construction and operation of infrastructure;
- No destruction of habitat will occur;
- No change to the current landscape will occur;
- No heritage artefacts or palaeontological resources will be impacted on;
- No avifaunal impacts will occur due to the establishment of the project;
- No additional traffic will be generated; and
- No additional water use will be required.

Table A.10. Summary of No-Go Alternative from Specialist Assessments

Specialist Study	No-Go Alternative Assessment
Agricultural Compliance Statement	The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. The one identified potential such impact is that due to continued low rainfall in the area, which is likely to be exacerbated by climate change, agriculture in the area will come under increased pressure in terms of economic viability. Although the development offers an alternative income source to agriculture, it does exclude agriculture from

Specialist Study	No-Go Alternative Assessment
	the impacted land. Therefore, the agricultural impact of the no-go alternative, which does not exclude agriculture, is less significant than the agricultural impact of the proposed development, and so, purely from an agricultural impact perspective, the no-go is the preferred alternative between the development and the no-go. But the development offers a land use with much higher income generating capacity than any viable agricultural land use on the site.
Visual Impact Assessment	In the no-go alternative, there would be no Solar Energy Facilities or additional power lines and therefore no additional visual intrusion on the rural landscape and on surrounding farmsteads. At the same time no renewable energy would be produced at the site for export to the national grid. The visual significance would therefore be neutral, with neither impacts nor benefits occurring.
Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology)	• **Archaeology and Cultural Landscape:** The No-Go alternative would entail not developing the projects and the landscape would remain in its present undeveloped state. Not developing the projects would not result in any new impacts to heritage resources. Existing natural erosion and weathering of artefacts, ruins and buildings would continue but at a very slow rate. Impact significance from the No-Go alternative is thus expected to be very low negative for all aspects of heritage. • **Palaeontology:** The No-Go alternative (i.e. no solar PV facility and power line development) will probably have a neutral impact on palaeontological heritage
Terrestrial Biodiversity and Species Impact Assessment Aquatic Biodiversity and Species Impact Assessment	It must also be noted that in terms of the no-go option, this will result in no additional impacts on biodiversity and will result in the ecological status quo being maintained, which will be to the advantage of the biodiversity. However, that being said, no fatal flaws were discovered in the course of the investigations for the proposed development.
Avifauna Impact Assessment	The no-go option will result in no additional impacts on avifauna and will result in the ecological status quo being maintained, which will be to the advantage of the avifauna. No fatal flaws were discovered in the course of the investigations.
Socio-Economic Impact Assessment	Assuming that the solar facilities and associated infrastructure, including power lines, would not be

Specialist Study	No-Go Alternative Assessment
	developed at the proposed sites, there would be no increase in electricity generation from the facilities, and no economic benefit to the landowners, or additional socio-economic benefits associated with the potential income generated through the construction and operation of the facilities. Indeed, one of the impacts identified (discussed in Section D of this Final BA Report) will materialise, should the proposed project not be developed. However, this does not imply that the no-go option has no impacts. It should be noted that the development's potential negative impacts may well come into being, regardless of the proposed development as most are associated with non-project-related phenomena which could trigger similar job-seeking, influx, and socio-economic impacts as identified for the proposed development. The potential positive impacts primarily relate to employment opportunities and the Economic Development Plan (EDP). With the exception of the 60 jobs for each project created during the operation phase with an approximate 20-year lifespan, all other employment, while of direct benefit to employees for the duration of their contract, is temporary in nature. The EDP has potential to sustainably benefit a far wider number of people and is likely to result in positive impact. The benefits of both employment and the EDP are not inconsequential, and should be pursued. Accordingly, the no-go option is likely to result in negative economic impacts on the project area, as the potentially positive impacts from the construction, operational, and decommissioning phases, including the EDP, employment and growth in the small-scale support industry, will be not be realised. The no-development alternative also poses a lost opportunity for South Africa to supply renewable energy to its consumers. This in effect represents a negative social cost. In addition, the no-go option will not assist National or Provincial governments in achieving their renewable energy commitments.
Geohydrology Assessment	In terms of the no-go alternative, if the projects do not go ahead, there will be no need to use approximately 5 – 8 million litres per year of groundwater per project. However, as noted above, there is a low water demand in the study area and a large spatial extent; and the impacts relating to the use of groundwater is not considered as highly significant

As outlined in Section D of this report, the majority of the negative impacts identified as part of this assessment can be reduced to moderate or low significance with the implementation of mitigation measures. None of specialists found that the proposed projects should not go ahead i.e. no fatal flaws were identified. As noted above, the Socio-Economic Impact Assessment identified positive impacts from a social upliftment perspective. These include benefits to the local community via employment opportunities and the development of locally-owned industries to support construction related activities.

Hence, while the "no-go" alternative will not result in any negative environmental impacts as a result of the proposed project; it will also not result in any positive community development or socio-economic benefits. It will not assist government in addressing climate change, reaching its set targets for renewable energy, nor will it assist in supplying the increasing electricity demand within the country. Hence the "no-go" alternative is not a preferred alternative, or a reasonable and feasible alternative considered in this BA Process.

A.13.2 Land-use Alternatives

At present the proposed site is zoned for agricultural land-use. The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The Witte Wall Farm 171 only has game. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.

The site has **very low agricultural potential** because of, predominantly, aridity constraints, but also due to soil constraints. It is generally **unsuitable for cultivation**, and agricultural land use is limited to **low density grazing**. The majority of land within the development area is of low agricultural sensitivity, but it includes areas of medium sensitivity.

Due to the low agricultural sensitivity of the site, and the effectively uniform agricultural conditions across the site, it is highly likely that there will be no material difference between the agricultural impact of any possible, alternative layouts on the site.

In order for South Africa to achieve its renewable energy generation goals, agriculturally zoned land will need to be used for renewable energy generation. It is far more preferable to incur a cumulative loss of agricultural land in a region such as the one being assessed, which has no cultivation potential, and low grazing capacity, than to lose agricultural land that has a higher potential, and that is much scarcer, to renewable energy development elsewhere in the country. The limits of acceptable agricultural land loss are far higher in this region than in regions with higher agricultural potential.

It is important to re-iterate that the economic benefits to the landowner associated with the proposed Solar PV Facilities and EGI are likely to be more significant than that of the current game farming activities on site. The proposed development offers a land use with much higher income generating capacity than any viable agricultural land use on the site. Based on the above, the agricultural land use is not a preferred alternative.

Refer to Sections B and D of this Final BA Report for a summary of the Agriculture Compliance Statement, as well as Appendix C.1 for the complete report.

A.13.3 Type of Activity - Renewable Energy Alternatives

In terms of the alternatives considered for the type of activity to be undertaken, this is entirely dependent on the activity associated with the proposed Solar PV Facilities (where the activity associated with the PV Facilities is generation of electricity). Essentially, the proposed Solar PV Facilities govern the type of activity associated with the proposed project. The activity to be undertaken is therefore the transmission of electricity that will be generated by the proposed Solar PV Facilities. The only feasible method of transmitting the electricity that is generated by the proposed Solar PV Facilities to the Eskom Kappa Substation is via overhead power lines. Underground cabling is not deemed technically feasible as indicated in Section A.5.

It is also important to note that the implementation of the PV Facilities at the proposed project sites was determined to be more favourable and feasible than other alternative renewable energy technologies, such as Hydro Energy, Biomass, and Wind Energy. Thus**, based on the preliminary investigations undertaken by the Project Applicant, no other renewable energy technologies are deemed to be appropriate for the site**. The unsuitability of other renewable energy developments for the site, as well as the potential risks and impacts of each, are discussed below (as described in the separate BA Reports for the PV Facilities).

A.13.3.1 Hydro Energy

The proposed project sites do not contain any large inland water bodies, which excludes the possibility of renewable energy from small or large scale hydro energy generation. In terms of micro hydro power potential, the South African Renewable Energy Resource Database (SARERD), has classified the proposed project area as “Not Suitable”. Therefore, the implementation of a Hydro Energy Facility at the proposed PV sites is not considered to be a reasonable and feasible alternative to be assessed as part of this BA Process.

A.13.3.2 Biomass Energy

The proposed project sites do not contain any abundant or sustainable supply of biomass. According to the SARERD, the proposed project area does not have any cumulative biomass energy potential. Therefore, the implementation of a Biomass Energy Facility at the proposed PV sites is not considered to be a reasonable and feasible alternative to be assessed as part of this BA Process.

A.13.3.3 2019 IRP, Wind and Solar SEA, Solar Energy and Wind Energy

The 2019 Integrated Resource Plan (IRP) was published in Government Gazette 42784, GN 1360 on 18 October 2019 for the period 2019 to 2030. As indicated in Figure A.10, coal makes up approximately 43 % of the total installed capacity indicated in the 2019 IRP, whereas Wind and Solar PV respectively make up 23 % and 10 %.

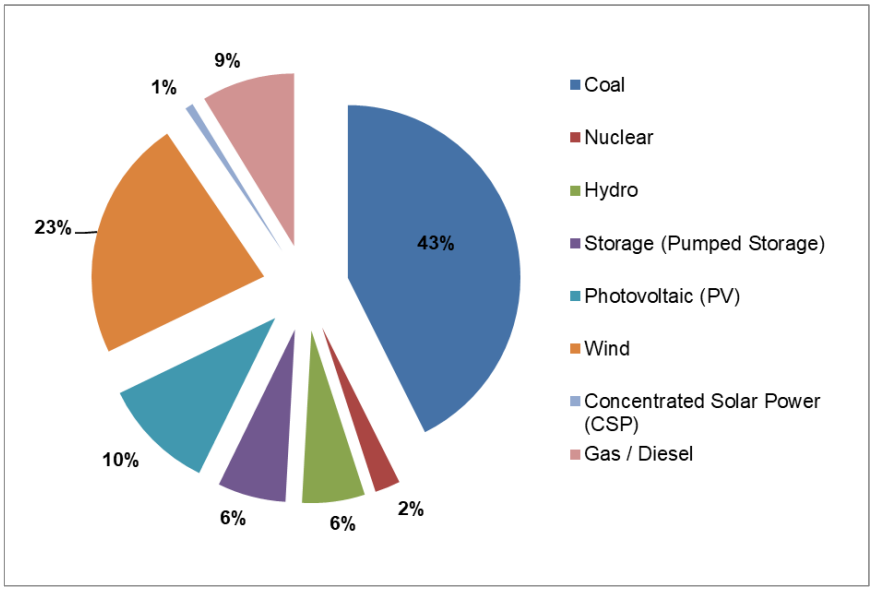
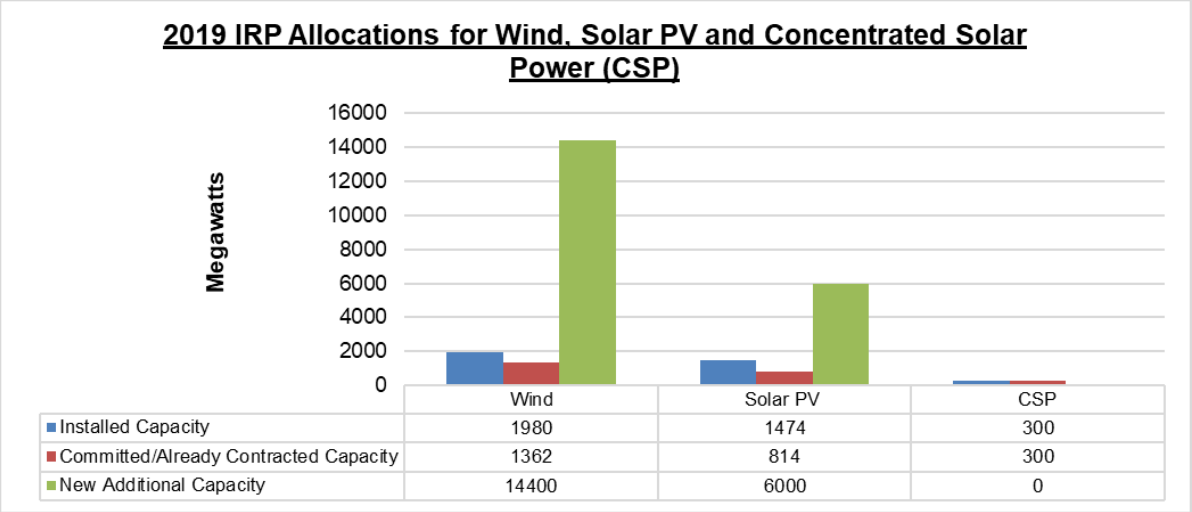


Figure A.10. 2019 IRP Total Installed Capacity (% of MW)

The 2019 IRP proposes to secure 26 630 MW of renewable energy capacity by 2030 (for Wind, Solar PV and Concentrated Solar Power). This amount excludes Hydropower and Pumped Storage. Of this total, 1474 MW of Solar PV, 1980 MW of Wind and 300 MW of Concentrated Solar Power is already installed capacity. In addition, of the 26 630 MW, approximately 814 MW of Solar PV, 1362 of Wind and 300 MW of Concentrated Solar Power is committed or already contracted capacity. Furthermore, 6 000 MW of Solar PV and 14 400 of Wind of this 26 630 MW is new additional capacity. This is indicated in Figure A.11.



	Wind	Solar PV	CSP
Installed Capacity	1980	1474	300
Committed/Already Contracted Capacity	1362	814	300
New Additional Capacity	14400	6000	0

Figure A.11. 2019 IRP Allocations for Wind, Solar and Concentrated Solar Power in MW

Linked to the 2010 IRP, the DMRE entered into a bidding process for the procurement of 3725 MW of renewable energy from IPPs by 2016 and beyond. On 18 August 2015, an additional procurement target of 6 300 MW to be generated from renewable energy sources was added to the REIPPPP for the years 2021 - 2025, as published in Government Gazette 39111.

On 7 July 2020, in Government Gazette 43509 and GN 753, the Minister of Mineral Resources and Energy, in consultation with the National Energy Regulator of South Africa (NERSA), determined that new generation capacity needs to be procured to contribute towards energy security. Specifically, 2000 MW will be procured from a range of energy source technologies in accordance with the short-term risk mitigation capacity allocated for the years 2019 to 2022 (under "other" in the allocation table contained in 2019 IRP). In line with this, the Risk Mitigation IPP Procurement Programme (RMIPPPP) was designed and launched in August 2020 by the DMRE in order to fulfil the GN 753 Ministerial Determination.

In order to submit a bid in terms of the REIPPPP, the proponent is required to have obtained an EA in terms of the EIA Regulations as well as several additional authorisations or consents. Linked to this, the National Department of Environmental Affairs (DEA) in discussion with the Department of Energy (DoE) (now respectively operating as the DEFF and DMRE), was mandated by MinMec to commission a SEA to identify the areas in South Africa that are of strategic importance for Wind and Solar PV development. The Phase 1 Wind and Solar PV SEA[2] was completed in 2015, and was in support of the Strategic Infrastructure Plan (SIP) 8, which focuses on the promotion of green energy in South Africa. As noted above, the SEA aimed to identify strategic geographical areas best suited for the roll-out of large scale wind and solar PV energy projects, referred to as REDZs. Through the identification of the REDZs, the key objective of the SEA was to enable strategic planning for the development of large scale wind and solar PV energy facilities in a manner that avoids or minimises significant negative impact on the environment while being commercially attractive and yielding the highest possible social and economic benefit to the country – for example through strategic investment to lower the cost and reduce timeframes of grid access. Following the completion of the SEA, the REDZs were gazetted in February 2018 in GN 114 by the Minister of Environmental Affairs. The location of the proposed projects within a REDZ (specifically REDZ 2 (Komsberg REDZ)) supports the development of a large scale renewable energy project (Refer to Figure A.3). The proposed projects are therefore in line with the national planning vision for wind and solar development in South Africa. GN 114 accommodates for associated infrastructure required for the necessary realisation of the Wind or Solar Facility, and as such the proposed EGI is also in line with national planning.

Based on the above, both wind or solar PV projects are supported within the REDZs. In order to ensure that a Wind Energy Facility is successful, a reliable wind resource is required. Wind resource is defined in terms of average wind speed and includes Weibull distribution (used to describe wind speed distributions); turbulence, wind direction, and pattern of wind direction (as depicted by a wind rose). These factors are all key considerations used in determining whether a site is suitable for the development of a Wind Energy Facility. A mean wind power density map has also been created (CSIR, 2018), which is not related to any specific turbine type and demonstrates the wind resource of the country. The mean wind power density map shows that the project area falls within an area of 300 W/m^2, which is considered as good viability for a wind project (Figure A.12). Overall, wind energy development can occur within this area but other localities in South Africa may be more favourable for wind energy development. Site specific requirements for wind energy facilities make it a less feasible alternative when compared to solar PV at this specific site. In addition, in 2019 the Project Developer had considered a site towards the south of the Kappa Substation (Zandrivier Farm 252) for the development of a Wind Energy Facility or solar PV facility, however during the initial screening stage, a terrestrial fauna and flora specialist confirmed that the development of a Wind Energy Facility on the Zandrivier Farm 252 is considerably more difficult as impacts associated with a wind energy facility are more difficult to manage, both spatially and temporally; and that due to the presence of the

[2] More information on the SEA can be accessed at https://redzs.csir.co.za

Critically Endangered Riverine Rabbit on the Zandrivier Farm 252, there is limited space available for a Wind Energy Facility. Therefore, the implementation of a Wind Energy Facility at the proposed site is not considered to be a reasonable and feasible alternative to be assessed as part of this BA Process.

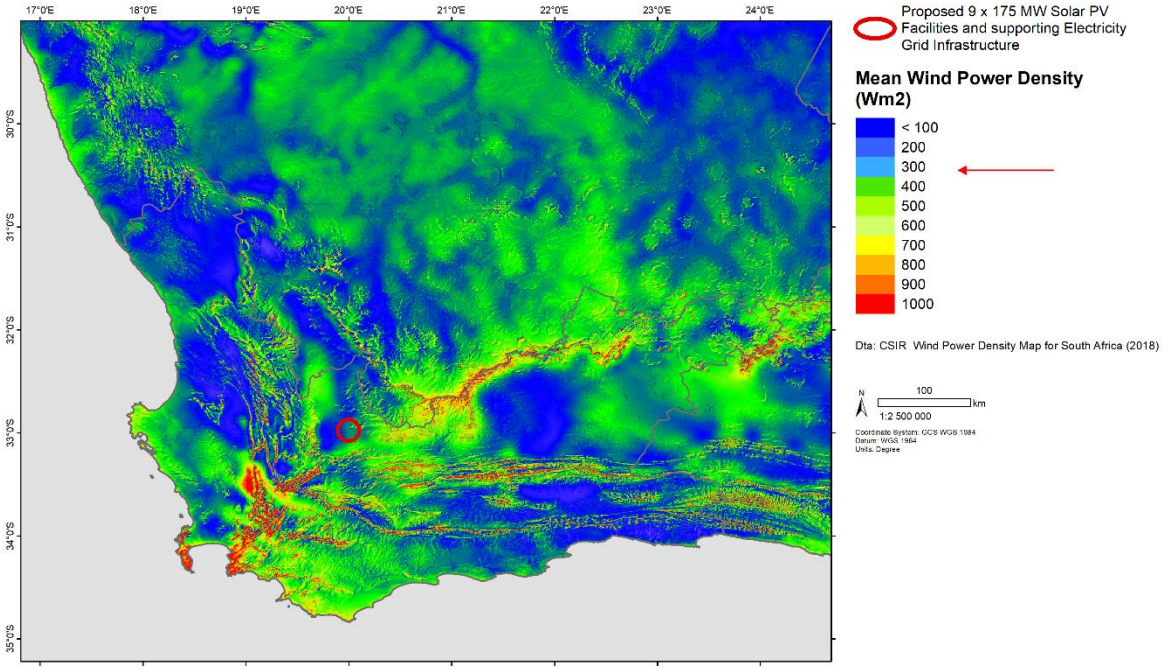


Figure A.12. Mean Wind Power Density for South Africa (CSIR, 2018)

In terms of the suitability of solar development at this location, the proposed project area has a high Global Horizontal Irradiation[3] (GHI), relevant to PV installations (Figure A.13). As indicated in Figure A.13, the site has a GHI of 2000 – 2200 kWh/m^2 in terms of the long-term yearly total. Therefore, this area is deemed as one of the most suitable for the construction and operation of solar energy facilities as opposed to other areas and provinces within South Africa. For example, coastal regions within the Eastern Cape and Western Cape mainly have a lower solar radiation (shown in the lighter orange shades in Figure A.13), which is not completely feasible for the proposed project.

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[3] Global Horizontal Irradiance is the total amount of shortwave radiation received from above by a surface horizontal to the ground

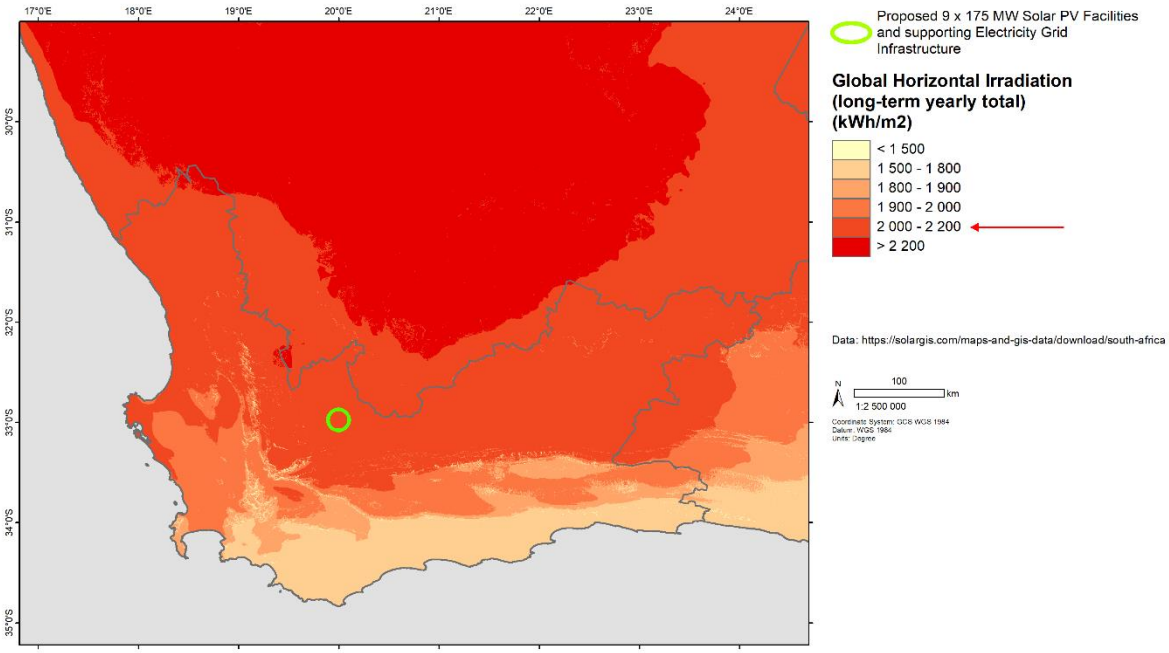

Figure A.13. Solar Resource Availability in South Africa

Therefore, the implementation of solar energy facilities at the proposed project site is more favourable and feasible than wind energy development. In terms of project and location compatibility, the proposed solar energy facilities are considered to be the most feasible renewable energy activity alternative.

Since the alternative activities considered were deemed not to be reasonable and feasible for the area and the site, no other renewable energy technologies alternatives were further assessed in this BA process.

A.13.4 Site Alternatives

The preferred site within the Western Cape was selected based on national level considerations (high solar radiation levels) and the fact that the proposed sites fall within the REDZ 2 (as discussed above).

In 2019, the following farm portions in the Western Cape were preliminarily considered for the PV Facilities:

- Remainder of Grootfontein Farm 149;
- Portion 5 of Grootfontein Farm 149;
- Remainder of Witte Wall Farm 171;
- Portion 1 of Hoek Doornen Farm 172; and
- Zandrivier Farm 252.

Preliminary screening took place on the above sites in order to identify the main areas to be avoided from a sensitivity perspective. A terrestrial fauna and flora specialist screening study of the proposed

Zandrivier Farm project site was undertaken in order to identify issues and constraints for development at the site for either wind or solar PV and to reduce the potential conflicts between the ecological sensitivities of the site and the development. The study concluded that major drainage lines are present on the Zandrivier Farm project site, which represent sensitive features that should be avoided as much as possible. These major drainage lines occupy a significant proportion of the Zandrivier Farm, and thus this places a constraint on the development potential of the site. The study confirmed that Riverine Rabbit is also present on the Zandrivier Farm and was observed at six different camera trapping sites. These were largely restricted to the drainage lines on site. In principle, this was not considered to be a fatal flaw of the proposed development. Based on the findings of the screening study undertaken for the Zandrivier Farm, the Project Applicant decided not to include this specific farm in the project, and rather focus the PV developments on the Grootfontein Farm 149, Witte Wall Farm 171, and Hoek Doornen Farm 172; which are not sensitive to the Riverine Rabbit (as explained in the Terrestrial Biodiversity and Species Assessment in Appendix C.4 of this report).

On a site specific (local) level, the sites on the affected farm portions were deemed suitable due to all the site selection factors (such as land availability, distance to the national grid, site accessibility, topography, current land use and landowner willingness) being favourable. The site selection criteria considered by the Applicant are discussed in detail below Table A.11.

Table A.11. Site selection factors and suitability of the site

FACTOR	SUITABILITY OF THE SITE
Land Availability	The affected farm portions are of a suitable size for the proposed projects.
Irradiation Levels	2000 – 2200 kWh/m^2
Distance to the Grid	The proposed projects are located approximately 20 km from the existing, authorised Eskom Kappa Substation. The PV Facilities will connect to the Kappa Substation via 132 kV overhead power lines.
Site Accessibility	The proposed project sites can be accessed via an existing farm gravel road, which will be upgraded as part of the proposed project (Refer to the separate BA Reports for the PV Facilities for additional information in this regard). The existing farm gravel road can be accessed from the R356 Regional Road.
Topography	There are no steep slopes of 1:4 on the proposed project sites.
Current Land Use	Agriculture - Grazing
Landowner Willingness	The landowner has signed consent for the use of the land for the proposed projects. This is considered an important aspect of the proposed project in terms of its viability (i.e. this will limit potential appeals during the decision-making process, as the landowner is willing and supportive of the proposed projects being undertaken on the farm).

Furthermore, from an impact and risk assessment perspective, the implementation of solar PV and EGI projects on the affected farm portions will most likely result in fewer risks in comparison to its implementation at alternate sites within the Western Cape (i.e. regions with similar irradiation levels), based on the following points:

- There is no guarantee that the current land use of alternative sites will be flexible in terms of development potential, for example the agricultural potential for alternative sites might be higher and of greater significance.
- There is no guarantee of the willingness of other landowners to allow the implementation of a solar facility on their land and if the landowners strongly object, then the project will not be feasible.
- There is no guarantee that other sites within the Western Cape will be located close to existing or proposed electrical infrastructure to enable connection to the national grid. The further away a

project is from the grid, the higher the potential for significant environmental and economic impacts.

As previously noted, the proposed projects form part of a larger project being proposed by Veroniva (i.e. the development of nine PV Facilities and power lines). The main determining points for Veroniva was to find suitable, developable land in one contiguous block to optimise design, minimise costs, and minimise sprawling development and impact footprints. In addition, the proximity to the Eskom Kappa Substation was a major determinant for identifying suitable sites for the proposed development.

Given the site selection requirements associated with solar energy facilities and EGI, and the suitability of the land available on the affected farm portions and no initial fatal flaws being present, no other site alternatives were considered as part of the BA Process. The sites on the affected farm portions were therefore deemed feasible and selected as the preferred sites.

A.13.5 Development Footprint Location and Layout Alternatives

As an initial step, the Project Developer consulted with the National Web-Based Environmental Screening Tool to seek a baseline description of the environmental sensitivities within the proposed site. Consultation with the landowner was also undertaken in order to identify possible areas that should not be proposed for the development. This guided the selection of the best area to be assessed by the specialists, from an environmental sensitivities and practical perspective.

A larger area was then assessed by the specialists in order to identify sensitive features, using desktop and field work methodologies (where required), which in turn led to the identification of the preferred sites for each of the 250 ha PV facilities (within the assessed area) and the proposed power lines. The sites for the proposed project infrastructure were identified to avoid the sensitivities highlighted by the specialists.

Based on the findings of the specialist studies, an environmental sensitivity map has been produced (as included in Section D of this report and Appendix A). This map shows the sensitivities on site (e.g. terrestrial ecology, watercourse features, and sensitive heritage features etc.) within the area identified and assessed.

The sensitive environmental features found within the preferred sites, as described in the specialist studies (Appendix C) and discussed in Sections B and D of this BA Report, are able to be avoided by the location, layout and design of the proposed projects.

Following the exclusion of the required areas, sufficient developable area is still available on site which does not compromise the current ecological integrity of the site or go against the requirements of the landowners.

A semi-detailed engineering design has also been undertaken to develop the current layout contained in Appendix A and B of this BA Report, which avoids all the environmental sensitivities identified on site, where required. The current layout is thus a culmination of extensive technical, economic and environmental planning.

A.13.6 Concluding Statement for Alternatives

The following alternatives were considered in the BA Phase:

- **No-go Alternative:**

The no-go alternative assumes that the proposed projects will not go ahead i.e. it is the option of not constructing the proposed projects. This alternative would result in no environmental impacts (positive and negative) on the site or surrounding local area, as a result of the proposed facilities. The no-go alternative has been investigated in this BA. **The no-go is not preferred**.

- **Land Use Alternative:**

The site has very low agricultural potential because of, predominantly, aridity constraints, but also due to soil constraints. It is generally unsuitable for cultivation, and agricultural land use is limited to low density grazing. The economic benefits to the landowner associated with the proposed Solar PV Facilities and EGI are likely to be more significant than that of the current activities on site. **Based on the above, the agricultural land use is not a preferred alternative.**

- **Type of Activity:**

In terms of project and location compatibility, the proposed solar energy facilities are considered to be the most favourable and feasible renewable energy activity alternative (i.e. in comparison to Biomass, Hydro Energy and Wind Energy). Solar energy is the preferred and only renewable energy technology alternative to be developed on site as a result of:

- The proposed projects fall within the REDZ 2 (Komsberg). The proposed project is therefore in line with the criteria of the SEA and located in an area of strategic importance for solar energy development;
- The site has a very good solar resource availability (i.e. GHI); and
- There are many wind energy projects being proposed in the region which will be bid in terms of the next REIPPPP bidding window. However, there are not many solar PV projects being proposed in the region, which serves as a positive pull factor towards diversifying the energy mix.

As noted above, the proposed Solar PV Facilities govern the type of activity associated with the proposed project. The activity to be undertaken is therefore the transmission of electricity that will be generated by the proposed Solar PV Facilities. The only feasible method of transmitting the electricity that is generated by the proposed Solar PV Facilities to the Eskom Kappa Substation is via overhead power lines.

- **Site Alternatives:**

Given the site selection requirements associated with solar energy facilities and the suitability of the land available on the affected farms and no initial fatal flaws being present, **no other site alternatives were considered as part of the BA Process**.

- **Development Footprint Location and Layout Alternatives:**

A large area was assessed by the specialists. The specialists identified environmental sensitivities within this region, which led to the identification of the most suitable area for each PV facility and power lines. Based on the inputs from the specialists, the layout was devised to avoid environmentally sensitive areas (no-go areas), while still retaining technical and financial viability, as well as the requirements of landowners (as applicable). The current proposed layout is the preferred layout that was assessed by all the specialists on the project team (Appendix A and B of this BA Report).

- **Summary Statement:**

Based on the above, the preferred activity is the development of renewable energy facilities and **associated EGI** on site using solar PV and overhead power lines as the preferred technology. In terms of the preferred location of the site, the five affected farm portions are preferred. The location and layout of the activity have been informed by the outcomes of the specialist assessments and technical feasibility, as well as landowner requirements. The preferred layout is further discussed in Section D of this report.

Overall, the proposed EGI is largely dependent on the proposed PV Facilities. The overall aim of this proposed project is to provide the necessary EGI to ensure that the nine proposed PV facilities are equipped and enabled to transmit the generated electricity (from the Solar PV Plant) to the Eskom Kappa Substation

A.14 Need and Desirability

It is an important requirement in the BA Process to review the need and desirability of the proposed project. Guidelines on Need and Desirability were published in the Government Gazette of 20 October 2014. These guidelines list specific questions to determine need and desirability of proposed developments. This checklist is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. Need and desirability answer the question of whether the activity is being proposed at the right time and in the right place. Table A.12 includes a list of questions based on the DEFF's Guideline to determine the need and desirability of the proposed project. It should be noted this table was informed by the outcomes of the BA Process.

It must be noted that the EGI is inherently linked to the Solar PV Facilities, and as such, the similar discussion around Need and Desirability applies.

Table A.12. The Guideline on the Need and Desirability's list of questions to determine the "Need and Desirability" of a proposed project

NEED	
Question	**Response**
1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area)?	
1.1. How were the following ecological integrity considerations taken into account? 1.1.1. Threatened Ecosystems, 1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure, 1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"), 1.1.4. Conservation targets, 1.1.5. Ecological drivers of the ecosystem, 1.1.6. Environmental Management Framework, 1.1.7. Spatial Development Framework, and 1.1.8 Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	**The environmental sensitivities present on site and ecological integrity considerations were addressed within the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) undertaken as part of this BA Process. The Avifauna Assessment (Appendix C.5 of the BA Report) also addresses ecological integrity.** **The above specialist studies explain that there are no Critically Endangered and Threatened Ecosystems on the study site. The 'endangered' and 'threatened' eco-systems identified within the Cape Winelands District Municipal region are not located within the study areas (they are located some 40 km to the east and the west of the site). According to the Western Cape Biodiversity Spatial Plan (WCBSP) (2017), the study area contains small areas of ESA and CBA.** **The WC DEADP explains in their comment on the Draft BA Report that a bioregional plan has not been adopted by the competent authority for the Western Cape geographical area, and as such as relevant listed activities in Listing Notice 3 are not applicable. As described in Section A.11 of this Final BA Report, the relevant listed activities that are no longer applicable, based on feedback from the WC DEADP and discussions with the project engineers, have been removed from the Application Form for EA. However, even though the bioregional plan has not been formally adopted by the Competent Authority, this BA Process has still assessed the impact of the proposed projects on Critical Biodiversity Areas and Ecological Support Areas in terms of the WCBSP (2017).** **Two principle factors are considered to be the master elements driving the localised ecology. These can be considered to be broadly meteorological factors, namely wind, rainfall and temperature, while edaphics, particularly giving rise to lithic or sandy environments may be considered a geophysical**

NEED	
Question	**Response**
	driver. **The specialists identified all ecological sensitive areas on site that would need to be avoided by the proposed development (e.g. scarps, ridges, slopes and the riparian environments), as well as how to suitably develop around and within these areas so that the ecological integrity of the areas is maintained (refer to Section D and Appendix C of this BA Report). However, in most cases, the specialists have confirmed that it is suitable for the power lines and service roads to cross drainage features; and that where possible existing footprint areas should be used for such infrastructure.** **A sensitivity map produced based on the input obtained from the various specialist studies is included in Section B and D of this Report, as well as in Appendix A.** **Research indicates that the Environmental Management Framework (EMF) for the Cape Winelands District Municipality is in draft form and has not been gazetted. The Screening Tool also notes that no intersections with EMF areas have been found.** **Feedback on the Witzenberg Local Municipality SDF (2020) is provided in this BA Report as relevant, as well as in the Socio-Economic Assessment (Appendix C.7 of the BA Report). Overall, the proposed project is in line with the Witzenberg Local Municipality SDF in terms of electricity developments.**
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	**The environmental sensitivities present on site and ecological integrity considerations were addressed within the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) undertaken as part of this BA Process. The Avifauna Assessment (Appendix C.5 of the BA Report) also addresses ecological integrity and environmental sensitivities. The specialists identified all ecological sensitive areas on site that would need to be avoided by the proposed development (e.g. scarps, ridges, slopes and the riparian environments), as well as how to suitably develop around these areas so that the ecological integrity of the areas is maintained (refer to Section D**

NEED	
Question	**Response**
	and Appendix C of this BA Report). However, in most cases, the specialists have confirmed that it is suitable for the power lines and service roads to cross drainage features; and that where possible existing footprint areas should be used for such infrastructure. **The buffer areas recommended by the specialists have been avoided in the layout of the proposed PV Facilities (as discussed in the separate BA Reports for the PV Facilities). A sensitivity map produced based on the input obtained from the various specialist studies is included in Section B and D of this Report, as well as in Appendix A.** **Measures to avoid, remedy, mitigate and manage impacts are included within the Terrestrial and Aquatic Biodiversity and Species Assessment, as well as the Environmental Management Programme (EMPr), included as Appendix G and Appendix H of this BA Report.**
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	**This development has the potential to impact on the ecology of the area. The proposed development is expected to result in an overall moderate ecological impact that may be reduced to "low" significance if suitable mitigation measures are employed. Refer to the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report); as well as Section D of the BA Report.** **Measures to avoid, remedy, mitigate and manage impacts are included within the Terrestrial and Aquatic Biodiversity and Species Assessment, and the EMPr, included as Appendix G and Appendix H of this BA Report.**
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether; what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	**The description of the potential waste generation is included in Section A of this BA Report (this Section). It is not anticipated that a significant amount of waste will be generated. Waste generation during the construction phase will include liquid effluent and solid waste, and other general and hazardous waste (e.g. contaminated spilled material). Waste generation during the operational phase will be very limited.**

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Question	**Response**
	Measures to avoid, remedy, mitigate and manage impacts are included within the EMPr, included as Appendix G and Appendix H of this BA Report. The EMPr was also supplemented with information received from authorities during the 30-day review period with regards to waste and pollution management.
1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	**A Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) was undertaken as part of this project (included as Appendix C.3 of this BA Report). Potential impacts to archaeological resources was identified as an impact during the construction and decommissioning phases. Potential impacts to the cultural landscape were identified as an impact during the construction, operation and decommissioning phases. The overall findings of the Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) are that the impact to heritage resources will be of low significance with the implementation of mitigation measures.** **From a palaeontology perspective, disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance was identified as an impact, rated with an overall very low significance with the implementation of mitigation measures.** **A Heritage profile is included in Section B of this report.** **The applicable measures to avoid, remedy, mitigate and manage impacts are included in Section D and Appendix C (full specialist study) as well as in the EMPr.** **Measures to avoid, remedy, mitigate and manage impacts are included within the Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology), and the EMPr, included as Appendix G and Appendix H of this BA Report.**
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these	**The proposed project requires water during the construction and operational phases. The water may be sourced from the local municipality or from existing boreholes in the vicinity of the proposed project area, if it is deemed to be of a suitable quality. The Geohydrology Assessment (Appendix C.8 of the Final BA**

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Question	**Response**
impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	**Report) explains that the water requirements can be met via existing boreholes.** **If water is sourced from the municipality, it will be trucked to site via water tankers and stored on site in above ground storage tanks. If the groundwater in the existing boreholes is determined to be of a suitable quality for use during the construction and operational phases, then it will either be trucked from the boreholes to the site via water tankers or transported via water pipelines from the boreholes to the site for storage in above ground storage tanks. As indicated in the separate BA Reports for the PV facilities, the proposed pipelines fall below the thresholds of the listed activities in Listing Notice 1 in terms of diameter and throughput.** **The landowners have been made aware and they have provided in principle agreement to use existing boreholes (such correspondence is included in the Geohydrology Assessment). The necessary approvals will be sought from the Department of Human Settlements, Water and Sanitation (DHSWS) should groundwater be sourced from the existing boreholes for the proposed project.** **Management actions to ensure the responsible and equitable use of water during the construction, operation and decommissioning phases are provided in the EMPr (Appendix G and Appendix H of this BA Report).**
1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts? 1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less	**The proposed project aims to transmit electricity generated from the proposed solar PV facilities. The proposed Solar PV project is seen as a source of 'clean energy' and reduces the dependence on non-renewable energy sources, such as coal fired power plants. Thus the proposed power lines and EGI are needed to support the solar PV facilities. The energy produced by the proposed PV facilities will feed into the national grid as a result of this proposed EGI. The proposed development is located in the Komsberg REDZ. The REDZs represent areas where wind and solar PV energy development is being incentivized from resource, socio-economic and environmental perspectives. For more information, refer to Section A.13 of this BA Report, which deals with Alternatives, and thus outlines the suitability of this activity.**

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Question	**Response**
material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life) 1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources of the proposed development alternative?) 1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?	**The environmental sensitivities present on site and ecological integrity considerations were addressed within the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) undertaken as part of this BA Process. The Avifauna Assessment (Appendix C.5 of the BA Report) also addresses ecological integrity.**
1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts?: 1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)? 1.8.2. What is the level of risk associated with the limits of current knowledge? 1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	**The environmental sensitivities present on site and ecological integrity considerations were addressed within the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) undertaken as part of this BA Process. The Avifauna Assessment (Appendix C.5 of the BA Report) also addresses ecological integrity.** **The precautionary approach has been adopted for this assessment, i.e. assuming the worst-case scenario will occur and then identifying ways to mitigate or manage these impacts. For example, the cumulative impact assessment considered that all approved renewable energy projects within the 30 km radius would be constructed. However, in reality it is unlikely that all will be constructed as most will be based on the outcomes of the bidding windows in terms of the REIPPPP. Therefore, this approach is considered to be precautionary in nature. Additionally, the location of the PV facilities and associated infrastructure within the assessed area and the layout thereof was determined based on the specialist findings.** **Refer to Appendix C of this BA Report for the complete specialist studies. These studies outline the assumptions and limitations that were applicable to the respective studies. The risk associated with the limits in knowledge is considered to be low.**
1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following: 1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of	**Refer to Section D and Appendix C of this BA Report which respectively include the findings of the specialist assessments, as well as the complete studies undertaken.**

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Question	**Response**
amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts? 1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	**The Socio-Economic Assessment (included in Appendix C.7 of this BA Report) notes that overall the potential negative impacts are rated with a very low to low significance, whilst the positive impacts are rated with an overall very low to high significance. The Socio-Economic Assessment further notes that it can be concluded that the prospective socio-economic benefits of the proposed projects outweigh the socio-economic losses or impacts. Creation of temporary employment, increased household income attainment and standard of living, and the development and/or growth of locally-owned industries were identified as some of the positive socio-economic impacts during the construction phase of the proposed projects.** **With regards to the Visual Impact Assessment (Appendix C.2 of this BA Report), the visual impact significance was considered to be low before and after mitigation. This is as a result of the relatively low structures and the local scale of the proposed solar facilities and related infrastructure, including EGI, located in a fairly remote area. The visual landscape could be restored after potential decommissioning which means that the visual significance would be very low with mitigation for this phase.** **Therefore, the overall negative impact to the environmental right of people in terms of social and visual impacts are considered to be very low to low.**
1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	**This is considered and addressed as part of the Socio-Economic Assessment undertaken for this project (included in Appendix C.7 of this BA Report, and summarised in Section D).** **The study confirmed that it should be accepted that the development of the proposed projects is likely to result in some form of negative social impact to the local community. However, such a negative impact needs to be weighed against the potential benefit likely to result from the same development. Given the overall very low to low significance of potential negative impacts associated with the project, as compared to the overall very low to high significance of potential positive impact of the project; it can be concluded that the prospective socio-economic benefits of the proposed project outweigh the socio-economic losses or impacts. From a socio-economic impact**

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Question	**Response**
	perspective, in light of the above argument, the specialist conducting the Socio-Economic Assessment recommended that the proposed projects should be authorised by the competent authority. **The above is also supported in terms of the status quo of the socio-economic conditions present in the Witzenberg Local Municipality, as indicated in Section B of this BA Report (as well as Appendix C.7 of the BA Report).**
1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives / targets / considerations of the area?	**The proposed projects support the objectives of the Witzenberg Local Municipality's Integrated Development Plan (IDP) (2017-2022) [Amended IDP (2020 – 2021)] which identifies renewable energy as a key economic sector. The Witzenberg Local Municipality IDP promotes the creation of an enabling environment to attract investment and support local economy. The third review of the 2017-2022 Cape Winelands District Municipality IDP (2020-2021; Page 49 and 51) also promotes renewable energy development as it states:** ▪ **"The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas).** ▪ **As a principle-led (and policy) response, authorities to consider and promote the development of renewable energy power generation capacity subject to appropriate scale, form and location".** **The Witzenberg Local Municipality's IDP (2017-2022) [Amended IDP (2020 – 2021)] and SDF (2020; Page 65) states that any renewable energy developments in the municipal area should preferably be located inside of the Komsberg REDZ, however, proposals for such development outside of this boundary will be considered on a case by case basis based on its own merits. The proposed projects are located within the boundary of the Komsberg REDZs, therefore is in line with the IDP and SDF of the Witzenberg Local Municipality.** **The inclusion of renewable energy not only plays to the natural strengths of the area (i.e. good solar irradiation levels), but also appears to be aimed at bringing parity between the existing employment sectors by providing much needed growth within the local construction and electricity employment**

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Question	**Response**
	sectors. The proposed activity therefore does not compromise any of the objectives set within IDP (2017-2022). The proposed projects will also be supportive of the IDP's objective of creating more job opportunities. One of the Strategic Objectives of the IDP of the Cape Winelands District Municipality (2020-2021; Page 20) is "creating an environment and forging partnerships that ensure social and economic development of all communities, including the empowerment of the poor in the Cape Winelands District". The Witzenberg Local Municipality IDP also promotes the creation of an enabling environment to attract investment and support local economy. Therefore, the proposed projects will be aligned with the vision and goals of the district and local municipality. **The environmental sensitivities present on site and ecological integrity considerations were addressed within the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) undertaken as part of this BA Process. The Avifauna Assessment (Appendix C.5 of the BA Report) also addresses ecological integrity.** **The above specialist studies explain that there are no Critically Endangered and Threatened Ecosystems on the study site. The 'endangered' and 'threatened' eco-systems identified within the Cape Winelands District Municipal region are not located within the study areas (they are located some 40 km to the east and the west of the site). According to the Western Cape Biodiversity Spatial Plan (WCBSP) (2017), the study area contains small portions of ESA and CBA.** **The WC DEADP explains in their comment on the Draft BA Report that a bioregional plan has not been adopted by the competent authority for the Western Cape geographical area, and as such as relevant listed activities in Listing Notice 3 are not applicable. As described in Section A.11 of this Final BA Report, the relevant listed activities that are no longer applicable, based on feedback from the WC DEADP and discussions with the project engineers, have been removed from the Application Form for EA. However, even though**

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Question	**Response**
	the bioregional plan has not been formally adopted by the Competent Authority, this BA Process has still assessed the impact of the proposed projects on Critical Biodiversity Areas and Ecological Support Areas in terms of the WCBSP (2017).
1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	**Refer to Section A.13 of this BA Report, which deals with Alternatives. This section outlines the suitability of the proposed activity.**
1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	**Refer to Section D of this BA Report, as well as the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report) and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report), which provide a description of the negative direct and cumulative ecological impacts. Some of the cumulative impacts identified in the Aquatic Biodiversity and Species Assessment include:** ▪ **Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment.** ▪ **Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment.** **Both the above impacts have been rated with a low significance with the implementation of mitigation measures. The mitigation measures include cordoning off the sites to prevent inward migration of fauna as well the implementation of other general management principles as per the EMPr; and ensuring a co-ordinated and sustained management of all nine PV and EGI Projects associated with this project.** **From a terrestrial biodiversity point of view, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:**

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Question	**Response**
	▪ **Alteration of habitat structure and composition, albeit primarily sporadic in nature, over an extensive and wide area;** ▪ **Changes in faunal populations through exclusion of certain species and beneficiation of others over an extensive and wide area – primarily on account of change in habitat as well as the implementation of security fencing;** ▪ **Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment;** ▪ **Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment; and** ▪ **Exotic weed invasion as a consequence of regular and continued disturbance across an extensive area of site** **All of the above impacts have been rated with a low significance with the implementation of mitigation measures. Various mitigation measures have been provided, as described in Section D of this Final BA Report and Appendix C.4 of this Final BA Report.** **The cumulative assessment also considers all nine proposed PV plants and nine power lines as part of this suite of developments (referred to as the Ceres PV Development) and 11 authorised renewable energy projects on some 50 000 ha of land within 30 km of the subject site.** **Overall, the majority of the cumulative negative impacts identified for the proposed project were rated with a low post mitigation impact significance for the construction phase, with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as moderate. The same trend is applicable to the operational phase, with visual impacts being rated as moderate. During the decommissioning phase, cumulative impacts were not identified and/or were considered insignificant, however for those that were rated, it resulted in an overall low to very low post mitigation impact significance, with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as**

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Question	**Response**
	moderate. In terms of positive impacts, the Socio-Economic impacts are rated as moderate significance for the construction and operational phases.
2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area	**The proposed projects support the objectives of the Witzenberg Local Municipality's Integrated Development Plan (IDP) (2017-2022) [Amended IDP (2020 – 2021)] which identifies renewable energy as a key economic sector. The Witzenberg Local Municipality IDP promotes the creation of an enabling environment to attract investment and support local economy. The third review of the 2017-2022 Cape Winelands District Municipality IDP (2020-2021; Page 49 and 51) also promotes renewable energy development as it states:** ▪ **"The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas).** ▪ **As a principle-led (and policy) response, authorities to consider and promote the development of renewable energy power generation capacity subject to appropriate scale, form and location".** **The Witzenberg Local Municipality's IDP (2017-2022) [Amended IDP (2020 – 2021)] and SDF (2020; Page 65) states that any renewable energy developments in the municipal area should preferably be located inside of the Komsberg REDZ, however, proposals for such development outside of this boundary will be considered on a case by case basis based on its own merits. The proposed projects are located within the boundary of the Komsberg REDZs, therefore is in line with the IDP and SDF of the Witzenberg Local Municipality. Even though the proposed solar facilities will not provide the municipality directly with electricity, the energy produced by the facility will feed into the national grid via the proposed power lines discussed in this BA Report.** **The inclusion of renewable energy not only plays to the natural strengths of the area (i.e. good solar irradiation levels), but also appears to be aimed at bringing parity between the existing employment sectors by providing much needed growth within the local construction and electricity employment sectors. The proposed activity therefore does not compromise any of the**

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Question	**Response**
	objectives set within IDP (2017-2022). The proposed projects will also be supportive of the IDP's objective of creating more job opportunities. One of the Strategic Objectives of the IDP of the Cape Winelands District Municipality (2020-2021; Page 20) is "creating an environment and forging partnerships that ensure social and economic development of all communities, including the empowerment of the poor in the Cape Winelands District". The Witzenberg Local Municipality IDP also promotes the creation of an enabling environment to attract investment and support local economy. Therefore, the proposed projects will be aligned with the vision and goals of the district and local municipality. The proposed projects will create job opportunities and economic spin offs during the construction and operational phases (if EA is granted by the DEFF). It is estimated that between 90 and 150 skilled and 400 and 460 unskilled employment opportunities are to be created during the construction phase for each project. Approximately 20 skilled and 40 unskilled employment opportunities will be created over the 20-year operational lifespan of the each of the proposed facilities. It should however be noted that employment during the construction phase will be temporary, whilst being long-term during the operational phase. **Therefore, the proposed solar PV facilities and EGI would help to address the need for increased electricity supply (on a national level) while also providing advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area.** **The proposed projects are also located in REDZ 2 (Komsberg) which is a geographical area that has been identified on a strategic planning level to have reduced negative environmental impacts but high commercial attractiveness (due to its proximity to, inter alia, the national grid) and socio-economic benefit to the country. The development of solar energy is therefore important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability. Therefore, the proposed project is in line with strategic plans and national policy, as it will enable the proposed Solar PV facilities to connect to the national grid.**

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Question	**Response**
2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integration of segregated communities, need to upgrade informal settlements, need for densification, etc.)	**This is not applicable, as the proposed project is located within a rural area and the site is zoned for agricultural use.**
2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.)	**Refer to Section B and D of this report for a description of the receiving environment and impact assessment, respectively. The impact of the proposed project on heritage features, including archaeology, cultural landscape, and palaeontology has been assessed the Heritage Impact Assessment (Appendix C.3 of this BA Report).** **The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The Witte Wall farm only has game. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.** **Should the proposed PV projects proceed, approximately 260 ha[4] of the land will be developed on per PV project, and it is not expected that this will significantly threaten the agricultural activities present on site. An Agricultural Compliance Statement (Appendix C.1 of this BA Report, and summarised in Section D) was undertaken as part of this BA to reflect the impact of the proposed project in terms of agriculture. The conclusion of the Agricultural Compliance Statement is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The study also concluded that the EGI specifically has a negligible agricultural impact.**
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	**The proposed projects support the objectives of the Witzenberg Local Municipality's Integrated Development Plan (IDP) (2017-2022) [Amended IDP (2020 – 2021)] which identifies renewable energy as a key economic sector. The Witzenberg Local Municipality IDP promotes the creation of an enabling environment to attract investment and support local economy. The third review of the 2017-2022 Cape Winelands District Municipality IDP (2020-2021; Page 49 and 51) also promotes renewable energy development as it states:**

[4] The final agricultural footprint of each PV project was considered to be in the order of 260 hectares in the Agricultural Compliance Statement. The Hoek Doornen PV 3 facility was reduced to an area of approximately 210 ha following the release of the Draft BA Report. This is not a significant change from an agricultural point of view.

NEED	
Question	**Response**
	▪ **"The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas).** ▪ **As a principle-led (and policy) response, authorities to consider and promote the development of renewable energy power generation capacity subject to appropriate scale, form and location".** **The Witzenberg Local Municipality's IDP (2017-2022) [Amended IDP (2020 – 2021)] and SDF (2020; Page 65) states that any renewable energy developments in the municipal area should preferably be located inside of the Komsberg REDZ, however, proposals for such development outside of this boundary will be considered on a case by case basis based on its own merits. The proposed projects are located within the boundary of the Komsberg REDZs, therefore is in line with the IDP and SDF of the Witzenberg Local Municipality. Even though the proposed solar facilities will not provide the municipality directly with electricity, the energy produced by the facility will feed into the national grid via the proposed power lines discussed in this BA Report.** **The proposed project would also provide advanced skills transfer and training to the local communities and creating contractual and permanent employment in the area.**
2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? 2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report, for an outline of the socio-economic impacts that could occur due to the proposed development of the solar PV facilities and associated EGI required to enable connection to the national grid.**
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	
2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long term? Will the impact be socially and economically sustainable in the short- and long-term?	

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Question	**Response**
2.5. In terms of location, describe how the placement of the proposed development will:	
2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report, for an outline of the socio-economic impacts that could occur due to the proposed development of the solar PV facilities and associated EGI required to enable connection to the national grid.** **The Socio-Economic Assessment (included in Appendix C.7 of this BA Report) notes that overall the potential negative impacts are rated with a very low to low significance, whilst the positive impacts are rated with an overall very low to high significance. The Socio-Economic Assessment further notes that it can be concluded that the prospective socio-economic benefits of the proposed projects outweigh the socio-economic losses or impacts. Creation of temporary employment, increased household income attainment and standard of living, and the development and/or growth of locally-owned industries were identified as some of the positive socio-economic impacts during the construction phase of the proposed projects.**
2.5.2. reduce the need for transport of people and goods,	**Not applicable. This is a renewable energy and EGI project proposal.**
2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	**Not applicable. This is a renewable energy and EGI project proposal.**
2.5.4. compliment other uses in the area,	**The area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The Witte Wall farm only has game. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit. Should the proposed PV projects proceed, approximately 260 ha[5] of the land will be developed on per PV project, and it is not expected that this will significantly threaten the agricultural activities present on site. An Agricultural Compliance Statement (Appendix C.1 of this BA Report, and summarised in Section D) was undertaken as part of this BA to reflect the impact of the proposed project in terms of agriculture. The conclusion of the Agricultural Compliance Statement**
2.5.5. be in line with the planning for the area,	

[5] The final agricultural footprint of each project was considered to be in the order of 260 hectares in the Agricultural Compliance Statement. The Hoek Doornen PV 3 facility was reduced to an area of approximately 210 ha following the release of the Draft BA Report. This is not a significant change from an agricultural point of view.

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Question	**Response**
	is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. Furthermore, the study also concluded that the EGI specifically has a negligible agricultural impact. The requirements of the landowner in terms of the current game farm activities have been taken into consideration in the design of the proposed Solar PV Facilities and associated EGI.
2.5.6. for urban related development, make use of underutilised land available with the urban edge,	**Not applicable. The proposed projects are located within a rural area and the site is zoned for agricultural use.**
2.5.7. optimise the use of existing resources and infrastructure,	**The proposed projects will connect to the existing Eskom Kappa Substation and will make use of existing access roads as far as possible. The gravel farm road leading to the solar PV facilities will be used for access and will be upgraded as part of the proposed Solar PV projects.**
2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	**These projects are a renewable energy and EGI project and not related to bulk infrastructure expansion.**
2.5.9. discourage "urban sprawl" and contribute to compaction/densification,	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report, for an outline of the socio-economic impacts that could occur due to the proposed development of the solar PV facilities and associated EGI. One of the impacts identified is the disruption of local social structures as a result of the construction work force and in-migration of job seekers. Adequate management measures have been identified in this regard.**
2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	**This is not applicable as the proposed projects are located within a rural area and the sites are zoned for agricultural use.**
2.5.11. encourage environmentally sustainable land development practices and processes,	**Based on the findings of this BA, the proposed projects would not have a significant ("high") negative impact on the receiving environment, with the implementation of suitable mitigation measures (Section D) and will therefore not go against sustainable land development practices and processes. In addition, the proposed projects will be designed according to relevant national specifications and standards which are regarded as best practice in the renewable energy sector. In addition, the proposed projects are located in a**

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Question	**Response**
	REDZ and the development proposal will therefore be aligned with national planning priorities.
2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	**Refer to Section A.13 of this BA Report, which deals with Alternatives. This section outlines the suitability of the proposed activity, as well as the selection thereof.**
2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report, for an outline of the socio-economic impacts that could occur due to the proposed development of the solar PV facilities and associated EGI. In addition, as noted in the Socio-Economic Assessment, the Applicant will ultimately own the project and, if successful, will compile an Economic Development Plan which will be compliant with REIPPPP requirements and will inter alia set out to achieve the following:** ▪ **Create a local community trust which has an equity share in the project life to benefit historically disadvantaged communities.** ▪ **Initiate a training strategy to facilitate employment from local communities.** ▪ **Give preference to local suppliers of components and/or services for the construction of the facility.**
2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	**A Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) was undertaken as part of this project (included as Appendix C.3 of this BA Report). Potential impacts to archaeological resources and graves was identified as an impact during the construction and decommissioning phases. Potential impacts to the cultural landscape was identified as an impact during the construction, operation and decommissioning phases. The overall findings of the Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) is that the impact to heritage resources will be of low significance with the implementation of mitigation measures.** **From a palaeontology perspective, disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance was identified as an impact, rated with an overall very low significance with the implementation of mitigation measures.**

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Question	**Response**
2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	**The proposed facilities are proposed in REDZ 2. Several renewable energy facilities and EGI are proposed in the area, which lends itself potentially to a renewable energy development area. Refer to Section D of this BA Report for an outline of the renewable energy projects authorised in a 30 km radius.**
2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	
2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report.**
2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	
2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report.**
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socioeconomic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best	

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Question	**Response**
practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	
2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	
2.13. What measures were taken to:	
2.13.1. ensure the participation of all interested and affected parties,	**The Public Participation Process (PPP) that has been undertaken as part of this BA is detailed in Section C of this report, as well as in Appendix D. The BA Report was released for a 30-day comment period, extending from 3 December 2020 to 25 January 2021, to all the relevant authorities and stakeholders. Various methods have been employed to notify potential Interested and Affected Parties (I&APs) of the proposed projects, namely, through a newspaper advert, site notice boards and notification letters via email, as well as SMS texts. The BA Process has taken cognisance of all interests, needs and values espoused by all I&APs, where relevant. Opportunity for public participation has been provided to all I&APs throughout the BA process in terms of the 2014 NEMA EIA Regulations (as amended). Furthermore, a meeting was held with the owner of the nearby Sadawa Game Farm and chairperson of the Ceres-Tankwa Karoo Farmers Association (who represents various farmers and I&APs in the Ceres Karoo) on 14 January 2021. Comments were received from the Association and various individual farmers. Refer to Appendix D for the copies of comments received and detailed Comments and Responses Report.**
2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3. ensure participation by vulnerable and disadvantaged persons,	
2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5. ensure openness and transparency, and access to information in terms of the process,	
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge,	
2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was promoted.	
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report.**
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the	**An EMPr has been developed to address environmental impacts, as well as health and safety concerns. An Environmental Control Officer will be**

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Question	**Response**
environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	**appointed to monitor compliance during the construction and decommissioning phases.**
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:	
2.16.1. the number of temporary versus permanent jobs that will be created,	**Refer to the Socio-Economic Assessment summarised in Section D and included in Appendix C.7 of this BA Report.**
2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	
2.16.3. the distance from where labourers will have to travel,	
2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits),	
2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	
2.17. What measures were taken to ensure:	
2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment,	**Legislation, policies and guidelines, which could apply to impacts of the proposed project on the environment, have been considered. The scope and content of this BA Report has been informed by applicable integrated environmental management legislation and policies. This has been included in Section A of this BA Report.**
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	**The PPP that has been undertaken as part of this BA is detailed in Section C of this report, as well as in Appendix D. The BA Report was released for a 30-day comment period, extending from 3 December 2020 to 25 January 2021, to all the relevant authorities and stakeholders. Various methods were employed to notify potential I&APs of the proposed project, namely, through a newspaper advert, site notice boards and notification letters via email, as well as SMS texts. The BA Process has taken cognisance of all interests, needs and values espoused by all I&APs, where relevant. Opportunity for public participation has been provided to I&APs during the BA process in terms of the 2014 NEMA EIA Regulations (as amended). Furthermore, a meeting was held with the owner of the nearby Sadawa Game Farm and chairperson of the Ceres-Tankwa Karoo Farmers Association (who represents various farmers and I&APs in the Ceres Karoo) on 14 January 2021. Comments were received from the Association and various individual farmers. Refer to Appendix D for the copies of comments**

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Question	**Response**
	received and detailed Comments and Responses Report.
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	**The outcomes of this BA process and the associated conditions of the EA (should it be received) will serve to address this question.**
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	**The proposed mitigation measures included in the EMPr and summarised in Section D of this report have been informed by the specialist studies undertaken and this includes a detailed assessment of the environment as well as the impacts associated with the proposed development. Solar energy facilities and associated EGI can be dismantled and completely removed from the site leased for the development and do not permanently prevent alternative land-uses on the same land parcel. Based on material and socio-economic terms, and measured to the value of the best alternative that is not chosen, the proposed project will result in positive opportunity costs.**
2.20. What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	**The EMPr of this proposed project must form part of the contractual agreement and be adhered to by both the contractors/workers and the Applicant.**
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	**Refer to Section A.13 of this BA Report, which deals with Alternatives. This section outlines the suitability of the proposed activity.**
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	**Refer to Section D of this report for a summary of the cumulative impacts. The Socio-Economic Assessment, included in Appendix C.7 of this BA Report, identified the following cumulative impacts:** • **Exacerbated in-migration of job seekers (negative impact); and** • **Combined human development caused by multiple EDPs being implemented (positive impact).** **The above impacts have been rated with a low to moderate significance.**

SECTION B: DESCRIPTION OF THE AFFECTED ENVIRONMENT

This section of the BA Report provides a broad overview of the affected environment for the proposed projects and the surrounding region.

For purposes of this BA Process, the Ceres Karoo is considered to be the area that covers the relatively flat plains at the origins of the Doring River catchment that drains northwards, with the R355 road running northwards through the Ceres Karoo to Calvinia with the Swartruggens Mountains on the western side; and the R356 road running north-east towards Sutherland and the Roggeveld Mountains of the High Karoo. The Ceres Karoo is the basin between these mountains. The Bontberg mountains and N1 road from the vicinity of Touwsriver to Matjiesfontein lie to the south of the Ceres Karoo. The towns of Touwsriver and Ceres are not located in the Ceres Karoo - they are south of the mountains that form the southern boundary of the Ceres Karoo. The Ceres Karoo is approximately 50 km from west to east, and about 70 km from south to north, the Eskom Kappa substation location in the southern portion and the main central transmission line from Gauteng to the Cape running through the southern portion.

The receiving environment is understood to include biophysical, socio-economic and heritage aspects which could be affected by the proposed development or which in turn might impact on the proposed development.

This information is provided to identify the potential issues and impacts of the proposed project on the environment. The information presented within this chapter has been sourced from:

- Input from the specialists that form part of the project team;
- Feedback from the Screening Tool, where applicable;
- Review of information available on the South African National Biodiversity Institute (SANBI) Biodiversity Geographical Information System (BGIS) and Agricultural Geo-Referenced Information System (AGIS); and
- The Witzenberg Local Municipality and Cape Winelands District Municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).

Feedback from the Screening Tool is provided in the sections below, only where it is applicable. For example, it is not applicable to the Socio-Economic Assessment and the Traffic Impact Statement.

It is important to note that this chapter intends to provide a broad overview of the affected environment. Detailed descriptions of the preferred project site focused on significant environmental aspects of these projects are provided in the relevant specialist studies (Appendix C of this BA Report).

B.1 Climate Conditions

According to the Koppen-Geiger climate classification method the area is classified “BSh”, which is indicative of an arid, hot environment. Such extremes have given rise to a regionally unique environment, both from an aquatic and terrestrial perspective. The climate data proves the area to be

arid, as it has low rainfall of approximately 200 mm per annum and high evaporation of approximately 1,500 mm per annum. The long term (1950 – 2000) mean annual precipitation for the study area is 197 mm per annum. Figure B.1 shows the study area falling within an area with a mean annual precipitation of less than 250 mm per annum. Most of the rainfall occurs during the winter months. Figure B.2 shows the monthly average air temperature and rainfall distribution and Figure B.3 shows the monthly median rainfall and evaporation distribution for the area (Schulze, 2009). From a meteorological perspective the study area is a “xeric habitat”, with an average annual rainfall recorded over the last 5 years of between just over 40 mm and 66 mm in 2017 (2020 may exceed this record). There is evidently, high spatial and inter-annual variability in rainfall patterns across the region. According to Mucina and Rutherford (2006), the region may be considered to be a “rain shadow desert”, where topography influences rainfall patterns. The rainfall does not exceed evaporation during the winter rainy season.

Temperatures in the region can be considered to be extreme, with the greatest range recorded in the area lying at 53 °C. The lowest recorded minimum temperature is -3 °C and the highest maxima being 50.2°C (Tankwa Weather, 2020). A mean maximum temperature of 35°C is recorded by the South African Weather Service. The mean July minimum temperature is 6°C (lowest measured -1°C), and the mean January maximum temperature is 38°C (highest measured 50°C). The highest average maximum temperatures occur from November to March with the hottest months being January and February. The highest wind speeds occur from October to March (SANParks, 2020).

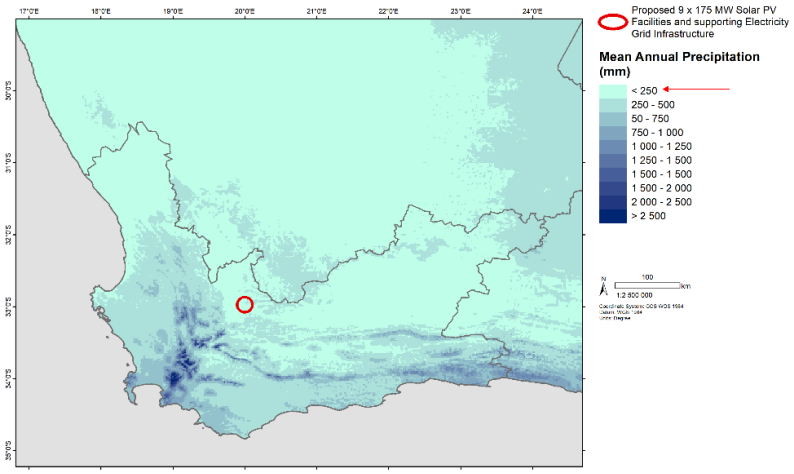


Figure B.1. Mean Annual Precipitation for the Northern and Western Cape Provinces, with the study area indicated in red.

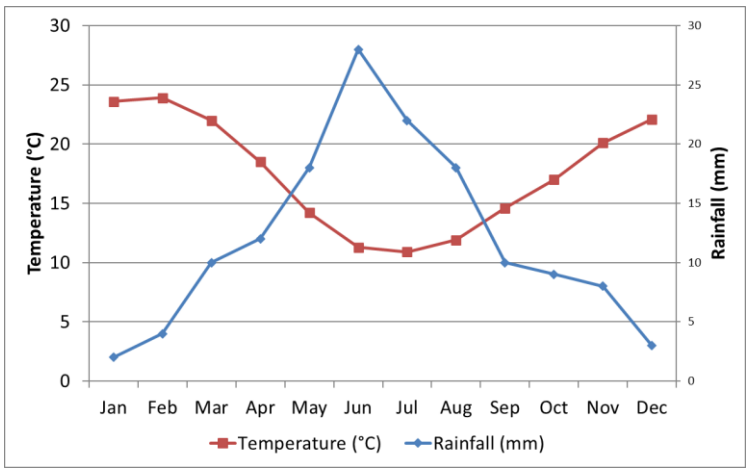


Figure B.2. Monthly average air temperature and rainfall distribution for the study area (Schulze, 2009).

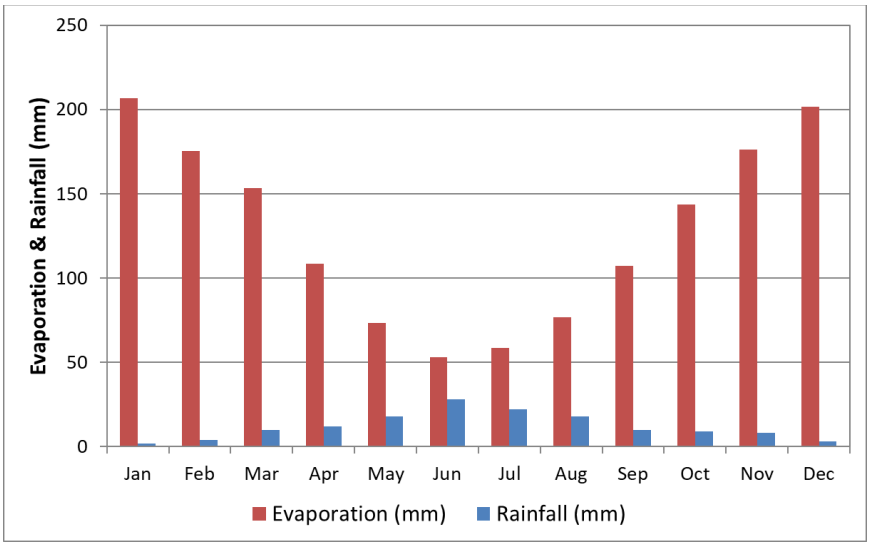


Figure B.3. Monthly average rainfall and evaporation distribution for the study area (Schulze, 2009).

The specialist studies included in Appendix C provide additional details regarding the climatic conditions on site.

B.2 Topography and Landscape

The Ceres Karoo is associated with a low altitude and generally flat to undulating landscape, not exceeding 1500 m amsl (Low and Rebelo, 1996). The study area can be described as a series of undulating plains and plateau, interspersed with occasional dolerite ridges. The lower elevations of the site are associated with sheet wash plains and larger ephemeral rivers that are dominated by alluvial sands, as noted in the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report), and the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report).

According to the Visual Impact Assessment (Appendix C.2 of the BA Report), the study area is surrounded to the west by the Swartruggens mountains, to the south by the Bontberg and to the

north-east by the prominent Roosterberg. The relatively flat eroded plain is a semi-arid landscape, being in the rain-shadow of the surrounding mountains. The relatively even topography presents few physical constraints for development, the only major feature being the broad dry drainage course of the Groot River. In terms of visual features and sensitive receptors, topographic features include landscape features in the area, such as hills, koppies and outcrops, which contribute to scenic and natural heritage value, providing visual interest or contrast in the landscape. The Visual Impact Assessment (Appendix C.2 of the BA Report) notes that except for river courses, there are no topographic or scenic features of note in the study area.

Detailed descriptions of the topography and landscape of the sites and surrounding regions are provided in the Specialist Assessments included in Appendix C of this BA Report.

B.3 Regional Geology

The Palaeontology Assessment (included as Appendix 4 of the Heritage Impact Assessment which forms Appendix C.3 of the BA Report) notes that the geology of the study area is outlined on four adjoining 1: 250 000 geology sheets i.e. Clanwilliam 3218, Sutherland 3220, Worcester 3319 and Ladismith 3320 (Council for Geoscience, Pretoria). A total of seven mappable sedimentary rock units (formations) are represented within the study area, most of which are assigned to the Karoo Supergroup and are of Gondwanan (Permo-Carboniferous) age. Within the PV facility project area, the Karoo bedrock succession generally youngs to the north and northeast towards the Klein-Roggeveld Escarpment. Given the gentle nature of the broad-scale folding, levels of tectonic deformation are generally low, with gentle bedding dips of 5º to 20° (occasionally higher dips are seen along the banks of the Groot River). In summary, the main geological units mapped within the study area include:

- Dwyka Group: Elandsvlei Formation;
- Ecca Group: Prince Albert Formation; Whitehill Formation; Collingham Formation; and Tierberg Formation;
- Karoo Dolerite Suite; and
- Superficial Deposits: Tertiary or Quaternary High Level Gravels; and Quaternary to Recent alluvium.

Based on the Geohydrology Assessment (Appendix C.8 of the BA Report), the geological units noted above are composed of (in order of youngest to oldest):

- dark-grey shale and siltstone (the Tierberg Formation);
- siltstone, chert and sandstone with thin interbedded shale and yellow weathering mudstone/tuff (the Collingham Formation);
- dark-grey shale, light-grey weathering with cherty siltstone beds (the Whitehill Formation);
- dark-grey shale with reddish-brown-weathering siltstone (the Prince Albert Formation); and
- tillite, diamictite, and subsidiary shale (the Dwyka Formation).

The Geohydrology Assessment (Appendix C.8 of the BA Report) also explains that the proposed development is located just south of two faults trending from north-east towards the south-west. These faults are prominent in the Kookfontein, Skoorsteenberg and Grahamstown Formations resulting in fracturing of the bedrock. Whereas, to the south of the Witte Wall Farm is a mapped Dolerite Dyke (Kf).

According to the Visual Impact Assessment (Appendix C.2 of the BA Report), the soft shales of the Tierberg Formation have been eroded by the Doring, Groot and Droëlaagte Rivers to form a broad, flat valley. More resistant sandstones give rise to the surrounding mountains, while alluvium occurs along the drainage courses. The larger study area to the south (where the proposed power lines will run consists of Dwyka Formation tillite, sandstone and mudstone.

A detailed description of the geology of the region is provided in the Palaeontology Assessment (included as Appendix 4 of the Heritage Impact Assessment which forms Appendix C.3 of the BA Report).

B.4 Agriculture and Soils

According to the Agriculture Compliance Statement (Appendix C.1 of the BA Report), the area is a sheep and game farming area. Low density, natural grazing is by far the predominant agricultural activity in the area. The Witte Wall farm only has game. The climate does not support cultivation without irrigation. Grazing capacity of the site is very low at 90 hectares per large stock unit.

The Screening Tool classifies agricultural sensitivity according to two criteria i.e. the cultivation status and the land capability. All cultivated land is classified as high sensitivity (or very high sensitivity). This is because there is a scarcity of arable production land in South Africa, in terms of how much is required for food security.

Uncultivated land is classified by the Screening Tool in terms of the land capability. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land. The higher land capability classes are suitable as arable land for the production of cultivated crops, while the lower suitability classes are only suitable as non-arable grazing land, or at the lowest extreme, not even suitable for grazing. In 2017, the then Department of Agriculture, Forestry and Fisheries (DAFF) released updated and refined land capability mapping across the whole of South Africa; which has greatly improved the accuracy of the land capability rating for any particular piece of land anywhere in the country. The new land capability mapping divides land capability into 15 different categories with 1 being the lowest and 15 being the highest. Values of below 8 are generally not suitable for production of cultivated crops. This land capability data is used by the Screening Tool.

The proposed site is identified by the Screening Tool as being of predominantly low sensitivity for agricultural resources, but it also includes patches of medium sensitivity. A map of the proposed study area overlaid on the Screening Tool sensitivity is shown in Figure B.4, Figure B.5 and B.6 below.

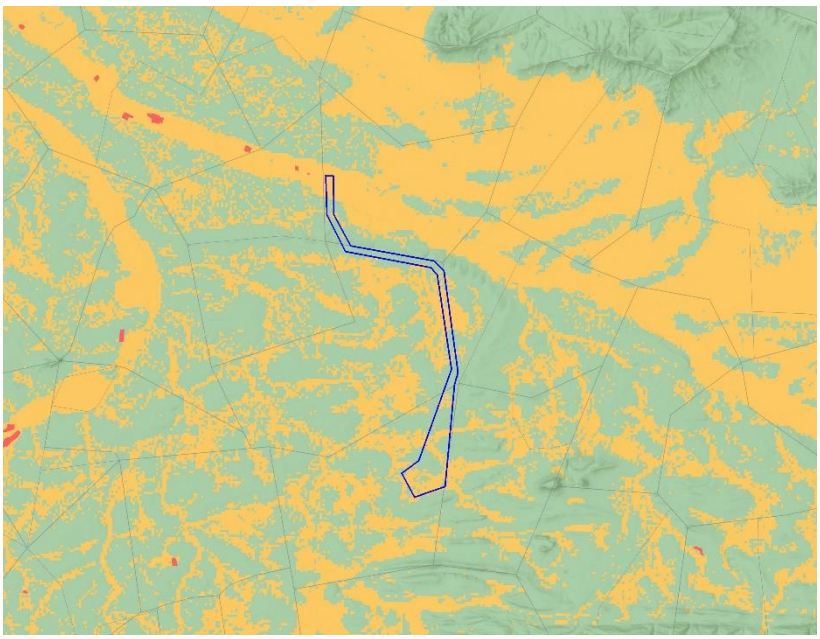


Figure B.4. The EGI corridor to support the Witte Wall PV Facilities (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

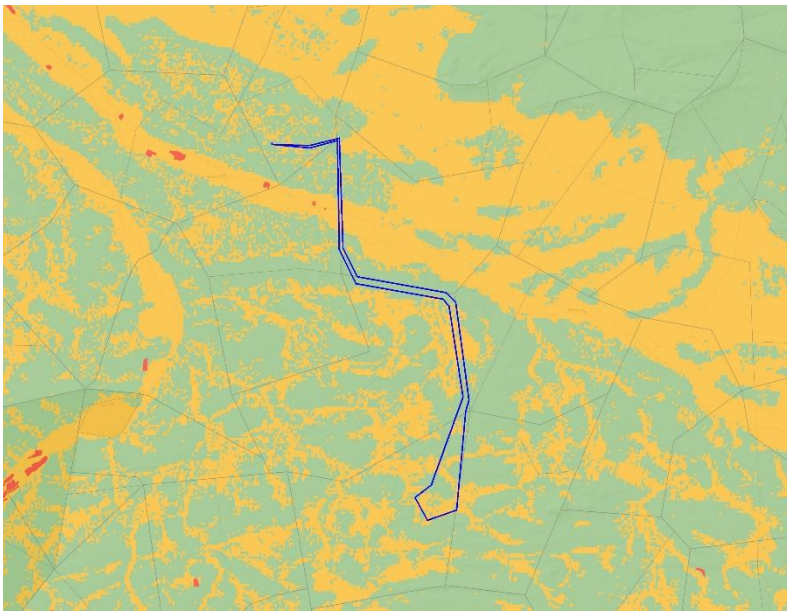


Figure B.5. The EGI corridor to support the Grootfontein PV Facilities (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

Figure B.6: The EGI corridor to support the Hoek Doornen PV Facilities (outlined in blue) overlaid on agricultural sensitivity as identified by the screening tool (low = green; medium = yellow; red = high).

The agricultural capability of all land in the study area is severely constrained by the aridity of the climate. The further basis for the agricultural sensitivity classification of land within the site is summarized in Table B.1.

Table B.1. The classification of moisture availability climate classes for summer rainfall areas across South Africa (Agricultural Research Council, Undated)

Sensitivity category	Cultivation status	Land capability evaluation values	General description
Low	Uncultivated	2 to 5	Constrained by aridity. Also constrained by shallow, rocky soils on underlying hard or weathering rock.
Medium	Uncultivated	6 to 7	Constrained by aridity. Less rocky alluvial soils along drainage lines.

The agricultural sensitivity, as identified by the Screening Tool, is confirmed by the Agriculture Compliance Statement (Appendix C.1 of the BA Report). The motivation for confirming the sensitivity is predominantly that the climate data (low rainfall and high evaporation) proves the area to be arid, and therefore of limited land capability. In addition, the land type data shows the dominant soils to be shallow, rocky soils, with limited pedological development on hard or weathering underlying rock. The land of the study area, therefore, without doubt, corresponds to the definitions of the different Screening Tool sensitivity categories in terms of its land capability and cultivation status.

Refer to the Agriculture Compliance Statement (Appendix C.1 of the BA Report) for additional information.

B.5 Geohydrology

As indicated in the Geohydrology Assessment (Appendix C.8 of the BA Report), the regional aquifer directly underlying the affected farm portions is classified by the Department of Water Affairs and Forestry (DWAF) (DWAF, 2002) as a fractured aquifer with an average yield potential of 0.1 – 0.5 L/s. A fractured aquifer describes an aquifer where groundwater only occurs in narrow fractures within the bedrock.

Based on the DWAF (2002) mapping of the regional groundwater quality, as indicated by electrical conductivity (EC), the majority of the affected farm portions are in the range of 70 – 300 mS/m with the southern corner of the portion in the range of 300 – 1 000 mS/m. This is considered to be "moderate to poor" quality for water, in terms of drinking water standards. Both these classifications are based on regional datasets, and therefore only provide an indication of conditions to be expected. The affected farm portions overlie a fractured aquifer that displays water bearing properties due to fracturing.

The Geohydrology Assessment (Appendix C.8 of the BA Report) included in a desktop assessment of the affected farm portions to determine if there are any groundwater users in the area. The National Groundwater Archive (NGA) database provides data on borehole positions, groundwater chemistry and yield, where available. The NGA indicated there is one borehole located within the Witte Wall Farm portion and eight boreholes surrounding the portion. The NGA registered site located on the Witte Wall Farm portion indicates a shallow drill depth of 67 m, drilled into sandstone and shale, with a relatively deep-water level of 10.68 mbgl and a poor EC of 496 mS/m. Overall, the NGA sites indicate a relatively shallow drill depth (12 – 80 m), drilled into varying lithologies of tillite, shale and sandstone. Yields are low, ranging from 0.25 to 0.63 l/s and EC's are moderate to poor ranging from 118 to 1192 mS/m.

There are four registered boreholes located within a search radius of 1 km around the Witte Wall, Grootfontein and Hoek Doornen Farm portion boundaries in terms of the Water Authorisation and Registration Management System (WARMS). This groundwater use is registered to neighbouring farm portions.

In addition to the above, there are also five boreholes located on the Witte Wall farm, which are relatively high yielding (airlift yields) for the area. The water is mainly used for domestic use and livestock watering.

There are also six boreholes on the Grootfontein farm, which contains water that is brackish and is mostly used for domestic use. Two of the boreholes indicate relatively high yields for the area of 4 000 to 6 000 L/h.

A total of 18 boreholes surrounding the Witte Wall Farm portion were also found using the Geohydrology Specialist's (i.e. GEOSS) internal database of previous projects conducted in the area. From GEOSS's internal database, it was determined that groundwater quality is poor (ranging from 169 to 1377 mS/m) with low yields ranging from 0.5 to 1.47 L/s. Water levels range from shallow (1.00 mbgl) to relatively deep (8.80 mbgl).

The Kareekolk Farm also contains a borehole, which is linked to a dam to store the groundwater. This borehole, reportedly, can pump up to 40 000 L/h for 9 hours per day. Quality at this stage is unknown.

Figure B.7 below shows the number of boreholes in the vicinity in terms of the NGA, WARMS and GEOSS database, as well as the additional boreholes identified on the Witte Wall, Grootfontein and Kareekolk farms.

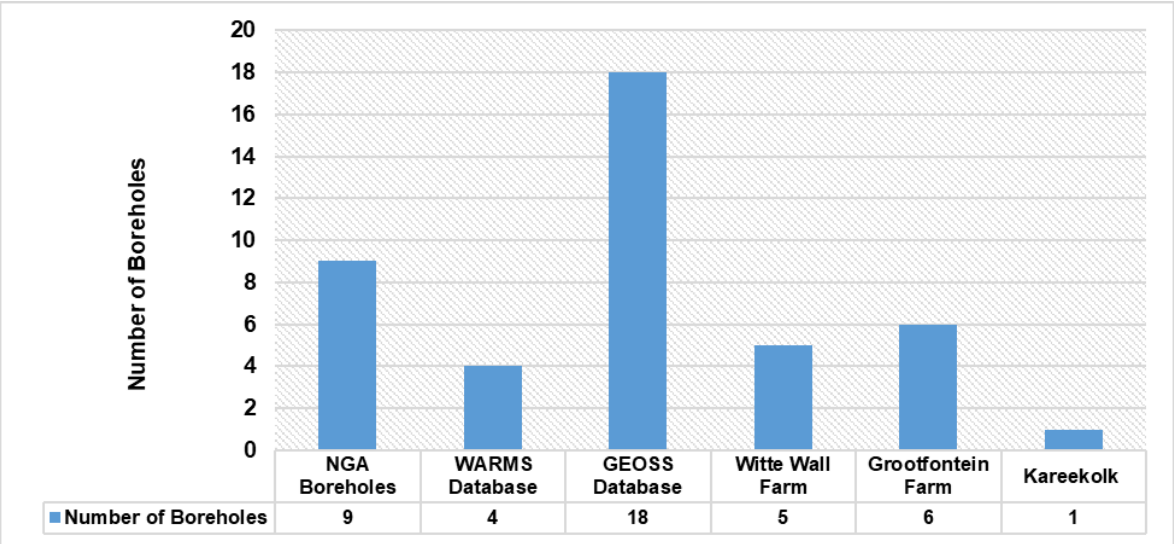


Figure B.7. Number of Boreholes in the vicinity of the proposed projects.

Refer to the Geohydrology Assessment (Appendix C.8 of the BA Report) for maps showing the boreholes captured on the NGA, WARMS, Grootfontein, Kareekolk, and Witte Wall Farms, as well as the GEOSS internal database boreholes; and the vulnerability rating (DWAF, 2005) and groundwater depths (mbgl).

B.6 Strategic Water Source Areas

Strategic Water Source Areas (SWSAs) are defined as “areas of land that either: (a) supply a disproportionate (i.e. relatively large) quantity of mean annual surface water runoff in relation to their size and so are considered nationally important; or (b) have high groundwater recharge and where the groundwater forms a nationally important resource; or (c) areas that meet both criteria (a) and (b)” (Le Maitre et al., 2018:1 in DEFF, 2019: Page 61). Thirty-seven groundwater SWSAs have been identified in South Africa and are considered to be strategically important at a national level for water and economic security (Le Maitre et al. 2018 in DEFF, 2019: Page 61). The total area for groundwater SWSAs extends approximately 104 000 km^2, and covers approximately 9% of the land surface of South Africa (Le Maitre et al. 2018, in DEFF 2019: Page 61).

There are no SWSAs within the project footprints. The closest SWSAs are about 20 km to the south-west. Refer to Figure B.8 below for a map showing surface water and groundwater SWSAs. This corresponds with the solar PV theme on the Screening Tool.

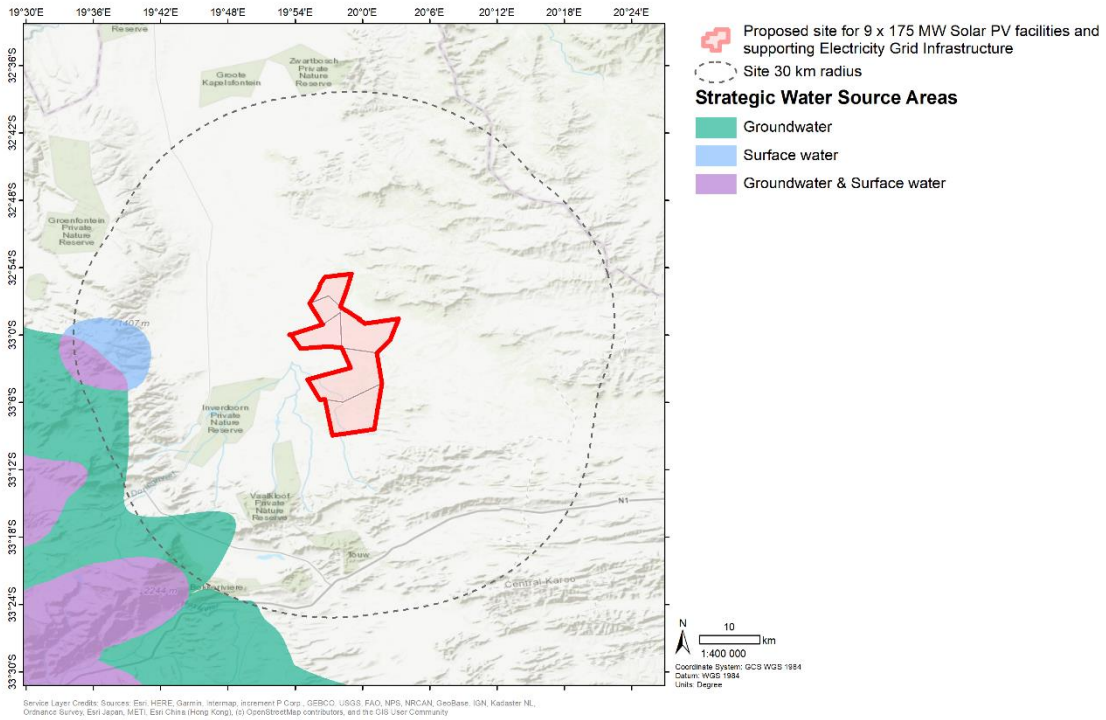


Figure B.8. SWSAs in relation to the locality of the proposed projects (i.e. all nine Solar PV Facilities and supporting EGI).

B.7 Aquatic Biodiversity

Various resources, such as, but not limited to, the SANBI BGIS and National Fresh Water Priority Areas (NFEPA), have been used to define the regional vegetation, water resources, fauna and anticipated ecological sensitivity of the study area. A literature review of existing reports, scientific studies, databases, reference works, guidelines and legislation relevant to the study area was conducted to establish the baseline ecological and vegetative condition of the site and associated environment. Details pertaining to the aquatic environment are provided in the Aquatic Biodiversity and Species Assessment (Appendix C.5 of this BA Report). The information provided in this section is based on Bundy et al (2020).

B.7.1 General Context

The affected farm portions lie within the southern extent of the Ceres Karoo, part of the Succulent Karoo Biome. The Ceres Karoo is associated with a comparatively low altitude and generally flat to undulating landscape, not exceeding 1 500 m amsl.

In an arid region such as the Tankwa, riverine environments are primarily seasonal systems, flowing intermittently during high precipitation events. These episodes of flow can be significant flood events as deep frontal rains, as well as orographic rainfall arises within the catchment and on the Hangklip mountain to the north east. Rainfall events are also seasonal (mainly a winter period phenomenon) and during the periods between such precipitation events, little or no flow arises in these systems.

Given the alluvial nature of these systems, little in the way of wetland environment is encountered in the river channels.

B.7.2 Biodiversity Conservation Planning

Critical Biodiversity Areas and Ecological Support Areas

Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) are indicated in terms of the Western Cape Biodiversity Spatial Plan (WCBSP) (2017). This preliminary data provided by the WCBSP is the product of a systematic biodiversity planning assessment which identifies portions of land that require safeguarding to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services, across terrestrial and aquatic realms (CapeNature, 2017). These spatial priorities are used to inform sustainable development in the Western Cape Province.

In addition to the above, CBAs and ESAs are separated further into CBA 1 and 2 as well as ESA 1 and 2 respectively. It is important to note that CBA 1 show areas in a natural condition and those that are potentially degraded or represent secondary vegetation are considered to be CBA 2. Similarly, a distinction is made between ESAs that are likely to be functional (i.e., in a natural, near-natural or moderately degraded condition; ESA 1), and ESAs that are likely severely degraded or have no natural cover remaining and therefore require restoration where feasible (ESA 2). The ESAs are not considered essential from a conservation perspective for meeting biodiversity targets; however, they may offer some ecological services.

The assessed area for the power lines, traverse a number of Terrestrial and Aquatic CBA and ESA delineated areas, as indicated in Figure B.9. However, the actual footprint of impact is minor.

As much of the floral and faunal diversity within the subject region is related to riparian environments, it is clear that by excluding the proposed development from these areas, impacts on areas or corridors that have significant ecological support functions are unlikely to be affected by the proposed development.

Refer to the sections above regarding the feedback from the WC DEADP around the legal status of the WCBSP and bioregional plans. Nevertheless, this BA Report has considered the impact of the proposed projects on CBAs and ESAs.

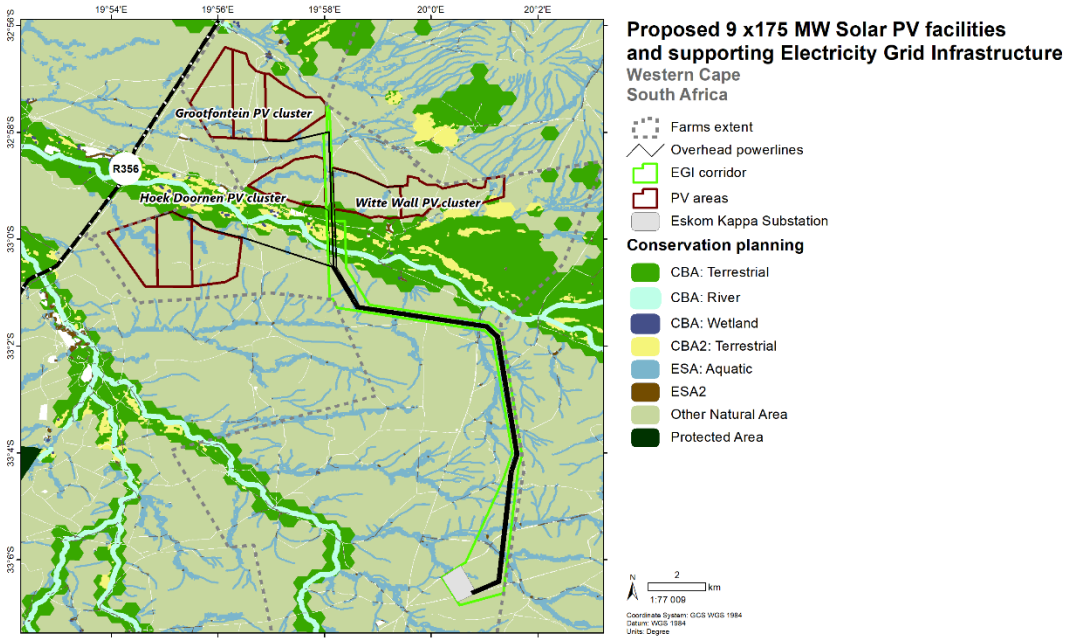


Figure B.9. CBAs and ESAs in terms of the WCBSP (2017).

Freshwater Ecosystem Priority Areas

The site is not located within a FEPA (i.e. freshwater priority area), but is situated within an upstream area associated with an identified FEPA. As such the subject site does not lie within any NFEPA sub catchments. As such there are no impacts of the proposed development on habitat condition and species in FEPA sub catchments. Refer to Figure B.10.

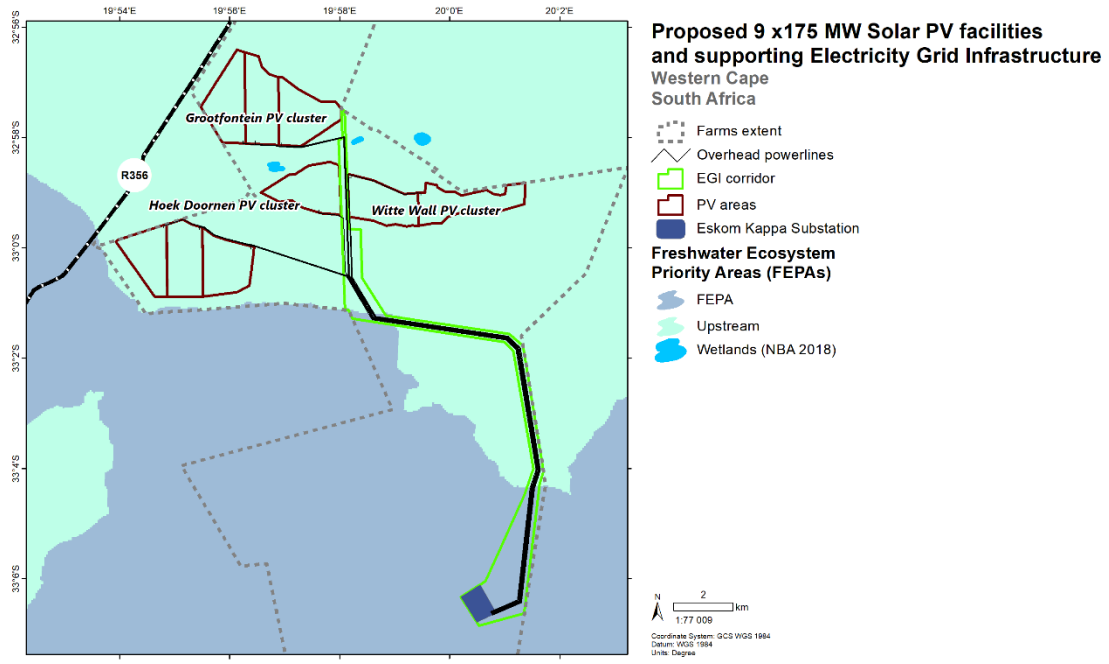


Figure B.10. NFEPAs in relation to the proposed development

Critically Endangered and Threatened Ecosystems

According to the SANBI BGIS, there are no Critically Endangered and Threatened Ecosystems on the subject sites. The 'endangered' and 'threatened' eco-systems identified within the Cape Winelands District Municipal region are not located within the study areas. Such areas are located some 40 km to the east and the west of the site, but do not extend into the subject area.

B.7.3 Aquatic Ecosystems

At a landscape level, riverine and riparian areas in the southern Tankwa region generally show improved vegetation cover and faunal presence on account of access to water and increased availability. The vegetation cover is however, primarily not hygrophilous in nature and is generally a *Vachellia karroo* dominated environment with *Lyceum cinereum* and *Salsola ceresica* being the dominant species within vegetation associes in these areas. Such species align with the Tankwa Wash Riviere habitat and as such, do not conform with the strict definition of "riparian vegetation". Mucina and Rutherford (2006) refer to this habitat as either "alluvial shrublands and herb lands", and "sheet washes".

These areas are however subject to intermittent but significant flooding and as such there can be significant transport of material within these riverine environments. As such these areas show a natural disturbance regime that results in scour and erosion, as well as significant deposition. Lighter falls may result in generally low-level inundation of pools and ponds within the riverine environments, and these may support small associes and consocies of *Spiloxene aquatica* and *Scirpoides dioecus*. Given the generally dry and erratic flows experienced within aquatic environments within the southern Tankwa region, aquatic biota is generally limited and cannot be utilised in the determination of the ecological state of these systems. Howsoever, terrestrial fauna is notably more prevalent in the Tankwa Wash Riviere habitat, primarily because of improved cover and access to water.

Given the above, anthropogenic factors have been a key determinant in the contemporary nature of the aquatic or riverine environments within the site. While the current land use on the site is game ranching, previous agricultural land uses have specifically focused on sheep and goat farming, which has been undertaken since the 1700s. The overgrazing of the land has given rise to poor vegetation cover and has contributed significantly to sediment deposition and alluvial conditions that presently prevail in the riparian environments. In addition, owing to the poor soils found in the terrestrial environments of the Tankwa, almost all cultivation practices, including the laying down of pasture, has been and continues to be undertaken in the riverine environments. There is thus regular and sustained disturbance in these areas. In addition, the scarcity of water in the region has resulted in the establishment of dams and other features to attenuate and capture water in the rivers. Some dams are successful, while others are less so, having been breached by the torrential flooding that arises from time to time.

In addition to the above, a point of some interest is the significant use of subterranean water through abstraction for the tending of livestock and other activities. Notably this water has a high salinity and as the subterranean water enters the riparian environment, such salts may have a small but pervasive effected on this habitat.

The affected farm portions incorporate the **Klein Droëlaagte River**, in the north and the **Groot River** in the south, as well a **small unnamed river system** flowing into the Groot River in the vicinity of the farm Witte Wall. The Droëlaagte River also lies to the further north of the site.

These rivers all ultimately flow into the Doring River and this in turn, serves the Olifants River, with its confluence approximately 60 km north of the site.

According to the DWS (2014) data for reach 8160 of the **Groot River**, this system has been classed on a desktop basis, as follows:

- Present Ecological State (PES) of “D” which is classified as “Largely modified. A large change in ecological processes has occurred and the system is appreciably altered”;
- Environmental importance (EI) of “moderate”; and
- Environmental sensitivity (ES) of “very high”.

The **Klein Droëlaagte River** has not been assessed, however the **Droëlaagte River**, from the same DWS (2014) data set and located downstream of the site is considered to have a PES of “D”, an EI ranked as “moderate” and an environmental sensitivity of “very high”.

The Groot River is part of a network of ephemeral river systems with intermittent flows primarily associated with the winter rainfall period. The wider riparian environment comprises of a network of minor channels that are active under low flow conditions, while under high flow conditions and flooding events, the entire riparian area can be subject to inundation.

On account of the general lack of flow within the channel, a number of dam and attenuation initiatives have been employed along the Groot River within Witte Wall and neighbouring farms in order to arrest flow and contain water for farming purposes. Larger dams on site are noted to have failed during the Laingsburg floods, having been breached by the flood waters. Smaller initiatives are also evident within the riparian environment, however most water used for stock and game farming is subterranean.

Vegetation comprises primarily of xeric shrubs associated with the Tanqua Wash Riviere habitat form, with *Lyceum cinereum* and *V. karroo* forming the dominant species in these areas. In isolated portions of the riparian environment, small outliers of *Scirpoides dioecus* may be evident within the primary channels, particularly where soils show an improved clay content and are able to retain moisture. The riverine environments show improved faunal populations on account of the increased availability of water near the surface, improved vegetation cover and related factors. Species identified within the riverine areas include *Pedioplanis laticeps*, the Karoo sand lizard, small mammals including the Cape hare (*Lepus capensis*) and the common mole rat (*Cryptomys hottentotus*). The latter, a fossorial species is evidently prevalent in these areas.

Using the above information, a desktop PES was compiled for the subject section of the **Groot River**. This PES ad Ecological Importance and Sensitivity (EIS) was determined as 2.5 and 1.3 respectively. A series of determinants for EIS are assessed on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance. This PES and EIS differs somewhat from the DWS classification with a slightly higher PES and somewhat lower EIS. This differentiation is attributed primarily to the more recent drought conditions that prevail across the site and the very low level of instream biota evident within the system at this point.

The catchment of the Klein Droëlaagte River is similar in nature to that of the Groot River. The dominant vegetation forms being *V. karroo*, with a primarily alluvium dominated bed form. A PES and EIS for the Klein Droëlaagte system were determined as 2.3 and 1.3, respectively. The EIS records a moderate level of EI, whilst PES shows a score of C - "*Moderately modified. A moderate change in ecological processes has taken place but the system remains predominantly intact*".

B.7.4 Aquatic Species

No aquatic biota was identified within the Klein Droëlaagte, Droëlaagte or the Groot Rivers. Given the ostensibly dry state of the river bed, as well as the intermittently extreme flow experienced in these systems, there is little likelihood of fish species being present within either of the two river systems at any given time. The nearest data relating to ichthyofauna within the catchment of these two rivers arises from the confluence of the Doring River and Groot River, some 60 km downstream. This data indicates the presence *Barbus capensis*, (Clanwilliam yellowfish), *B. serra* (Clanwilliam sawfin) endangered, *Galaxias zebratus* and the endangered Clanwilliam sandfish, *Labeo seeberi*. *Micropterus salmoides*, the exotic largemouth bass, has also been recorded from these areas (DWS, 2014). Recent attempts to locate *L. seeberi* in the lower Tankwa River have not been successful.

The Animal Demography Unit (ADU) data base identifies only two anurans (frogs) from the Tankwa region, these being *Vandijkophrynus gariepensis gardenias* (Karoo toad) and the common *Amietia fuscigula* (the Cape river frog). *A. fuscigul*a is rapidly expanding its range, utilising farm dams and open water, while *V. gariepinus* is an abundant species in the region. Both species are considered to be of least concern from a conservation perspective.

Data derived from the ADU identified three families of Odonata (dragonflies) within the region, these being the Libellulidae, Gomphidae and Coenagrionidae (FitzPatrick Institute of African Ornithology, 2020). All species are of least concern from a conservation perspective. Notably Libellulids are commonly associated with stagnant or still waters, rather than streams and regular flow, which would account for their representation in this region.

In general, much of the riparian areas within the region are subject to regular disturbance primarily on account of farming activities, where cultivation and pastural activities are compelled to be undertaken within these areas. More terrestrial environments are not easy to till and are generally water deficient and thus production is poor.

B.7.5 Screening Tool Descriptions and Site Verifications

Evident from the Screening Tool data is that much of the area under consideration is considered to be of low sensitivity in terms of the aquatic biodiversity prevalent in the region. The data does however indicate “very high” sensitivity in respect of the Groot River which bisects the site. The Klein Droëlaagte River is not represented on the Screening Tool. The ecological sensitivity is however believed to approximate that of the Groot River. The Screening Tool identifies the very high sensitivity areas as Aquatic CBAs, Rivers, Wetlands and Freshwater Ecosystem Priority Area quinary catchments. However, it must be noted that the actual footprint of the PV Facilities is only earmarked as low sensitivity on the Screening Tool from an aquatic biodiversity sensitivity perspective.

The proposed projects are considered to be suitably set back from the riparian environments associated with both the Groot River and the Klein Droëlaagte River and as such maintain these riverine environments as both a faunal and intermittent hydrological pathway and corridor as well as offering improved refugia for fauna. The power lines do cross these rivers, resulting in some pylons to be placed within the dry river bed of the Groot River. No wetland environments were identified within the project area.

B.8 Terrestrial Biodiversity

Various resources, such as, but not limited to, the SANBI BGIS and aerial imagery, have been used to define the regional vegetation, water resources, fauna and anticipated ecological sensitivity of the study area. A literature review of existing reports, scientific studies, databases, reference works, guidelines and legislation relevant to the study area was conducted to establish the baseline ecological and vegetative condition of the site and associated environment. Details pertaining to the terrestrial environment are provided in the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of this BA Report). The information provided in this section is based on Bundy et al (2020).

B.8.1 General Context

Refer to Section B.8.1 above for information on the general context of the site from an ecological perspective.

B.8.2 Biodiversity Conservation Planning

Refer to Section B.8.2 above for information on the biodiversity conservation planning of the site from an ecological perspective.

B.8.3 Terrestrial Ecosystems

According to Mucina and Rutherford (2006), and as shown in Figure B.11 below, two habitat forms or veld types are evident within the PV sites, which are of least concern:

- Tanqua Karoo (SKv 5), a form of the Succulent Karoo Biome; and
- Tanqua Wash Riviere (AZi 7), a riparian habitat form.

Both these veld types are considered “least threatened” from a conservation perspective.

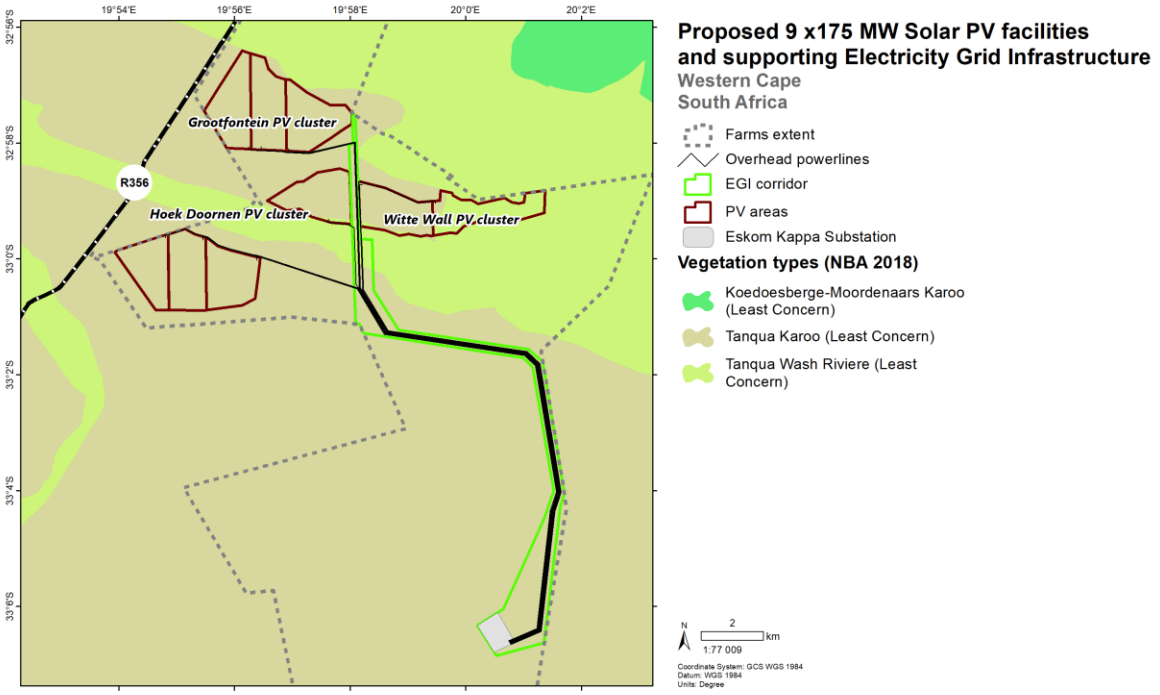


Figure B.11. Map depicting Vegetation or Veld Types for the proposed development.

B.8.4 Ecological Processes, Functioning and Drivers

Two principle factors are considered to be the main elements driving the localised ecology. These can be considered to be meteorological factors, namely wind, rainfall and temperature, while edaphics, particularly giving rise to lithic or sandy environments may be considered a geophysical driver. Notably, anthropogenic factors have over the previous century proven to be a key driver in contemporary habitat form and structure.

In addition to the above, wind is a key issue within the region, driving sediment movement and promoting aeolian, sediment transport in areas exposed to high winds and with little vegetative cover. Where vegetation cover has been compromised, aeolian transport generally prevents the natural re-establishment of plants. The dominant winds within the subject site are the north westerly and southerly wind, which are seasonally prevalent. Sheet wash is also conspicuous to the east of the site, where sediments transported from up-slope have been deposited, proximal to the riverine areas.

Due to the temperature extremes, plant communities and faunal populations in the region generally show high levels of adaptation, occurring in specific areas or zones and with the utilisation of specific, niche environments, e.g. scarp slopes and riverine environments by both floral and faunal communities, or behaviour concomitant with specific environments.

Given the above, anthropogenic factors have been a key determinant in the contemporary nature of the terrestrial habitat within the site. It was also common practice in the past to utilise the flood plains of proximal rivers on sites for the cultivation of crops and pasture and indeed this practice prevails today.

The above natural and anthropogenic factors have given rise to a generally altered environment and concomitantly changed habitat.

B.8.5 Terrestrial Species

Although much of the land within and proximal to the site has been subject to significant change on account of previous land use practices (Acocks 1988), faunal populations and diversity can generally be described as moderate to high on account of limited anthropogenic presence. Botanical diversity is generally associated with niche environments, in particular rock ridges and sandy or stone wash plains (sheet wash), and in these areas geophytes may be evident. Refer to the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of this BA Report) for the recorded botanical and faunal species common to the study area and surrounds.

The majority of the listed flora are aizoons of the Family Aizoaceae (“succulents”). Of interest is *Haemanthus tristis* which is a rare species identified in the southern Tanqua Karoo, proximal to the study site. Other important endemic species identified include *Tanquana prismatica*. Graminoids are limited to primarily the genus *Stipagrostis* (e.g. *S. obtusa*), if encountered at all. Fauna recorded from the region are evidently weighted in favour of mammal species, with Muridae (rodents), being the dominant species on record. Only *Miniopterus schreibersii*, (long fingered hairy bat) is to be considered of conservation significance, being classified as “near threatened”. Notable by its absence is *Bunolagus monticularis*, the Riverine Rabbit. Refer to Section B.10 of this BA Report for additional information on the Riverine Rabbit.

B.8.6 Key Landscape Features

The study area, as indicated above, lies on an undulating ridge and plateau complex with ephemeral riverine environments comprising of deep to moderately deep, alluvial sands. In some instances, there are distinct junctures between the terrestrial and riparian edge on account of steep, shale or sand cliffs. Sheet wash, associated with the foot of ridges, or occasionally around the riverine environments are apparent at points.

As noted above, the riparian system of the Groot River, which lies to the south of the site, is associated with the southern extent of the catchment of the Tankwa River, where the confluence of the two systems is located, downstream of the Oudebaaskraal Dam.

As noted above, the study area encompasses two habitat forms, namely Tanqua Karoo and Tanqua Wash Riviere. The former is a definitive arid succulent vegetation form of low, forb-dominated vegetation and no natural forest habitat is present. Within the Tanqua Wash Riviere habitat form, woody habitat is evident dominated by *Vachellia karroo*. From a legal perspective, such areas may be considered forest (in terms of the National Forest Act (Act 84 of 1998)); however, these small isolated communities do not align with the ecological definition using Raunkiaer Classification (1934).

Vachellia karroo or canopied environment would not be affected by the proposed PV facilities in its entirety. However, the establishment of the powerline servitude across the Groot River may see the

need to remove some specimens, subject to the placement of towers and the manner in which the line is strung.

B.9 Riverine Rabbits

3Foxes Biodiversity Solutions was appointed as part of this BA Process to provide specialist faunal input for the proposed development, with particular reference on the Riverine Rabbit, *Bunolagus monticularis*, which is listed as Critically Endangered and considered one of the most threatened mammals in South Africa. This species is known from the area and has been recorded on some of the properties that lie adjacent to the proposed project sites. The Riverine Rabbit Habitat Assessment and Camera Trapping Survey Report is included as an appendix to the Terrestrial Biodiversity and Species Assessment, which is included in Appendix C.4 of the BA Report.

As the Riverine Rabbit is the vertebrate species of particular concern at the site, camera trapping was used across the site to establish the presence or absence of the Riverine Rabbit and also to characterise the fauna of the site more generally. A total of 30 camera traps were distributed across the site, on 8 and 9 September 2020 and retrieved on the 21 and 22 October 2020, giving rise to 6 weeks of continuous camera trapping.

The information below provides a description of the habitats present at the site and their sensitivity based on their habitat suitability for Riverine Rabbits and the likelihood that Rabbits are present in these areas. The habitats include Tanqua Karoo Plains, Tanqua Karoo Dunes, Minor Drainage Lines and Major Drainage Lines.

- **Tanqua Karoo Plains:** As noted above, the majority of the site is classified as the Tanqua Karoo vegetation type. Within the site at least, this is a generally homogenous vegetation type which occupies the extensive plains of the site. There are however several different communities associated with this vegetation type, determined by the substrate conditions. On calcrete soils, the vegetation tends to be dominated by *Pteronia paniculata*, while on most other soil types, the vegetation is dominated by *Ruschia intricata*. This is not considered to represent an important habitat type for Riverine Rabbits and it is highly unlikely that they occur in this habitat type. As a result, this habitat type is considered low sensitivity and development can proceed within this habitat with minimal potential consequence for Riverine Rabbits. Under the layout of the proposed development as assessed, the majority of the development footprint is located within this habitat type.

- **Tanqua Karoo Dunes**: There is a relatively small extent of this habitat within the farm Hoek Doornen (which is described further in the separate BA Report that addresses the Hoek Doornen PV Facilities (i.e. Report 3)).

- **Minor Drainage Lines:** There are several minor drainage lines and washes across the site. These are not considered to represent optimal habitat for Riverine Rabbits as the extent of associated floodplains and riparian vegetation is limited and there is probably insufficient habitat along these minor drainage features to support a population of Riverine Rabbits. These areas are however important for landscape connectivity as it is likely that these features are used for movement and migration of Riverine Rabbits when moving about the landscape. In addition, such sub-optimal areas can be important during times of stress as they can provide a resource that can be used when the primary habitat has become degraded or over-utilised. The core drainage features are mapped as Very High sensitivity while the adjacent floodplains and riparian vegetation are mapped as High sensitivity. It would be acceptable for roads to traverse these

features if there no existing roads that can be upgraded or alternative suitable access possibilities.

- **Major Drainage Lines:** The major drainage line which traverses the site is the Groot River. The floodplain of the river is usually at least 500 m wide and consists of a confined or braided channel flanked by silty floodplains dominated by halophytic shrubs such as *Salsola aphylla* with occasional stands of *Vachellia karroo*. Although there are some parts of the floodplain that are degraded, possibly as a result of historical overgrazing, there are also extensive areas with dense riparian vegetation that is considered to represent excellent Riverine Rabbit habitat. Although no rabbits were captured on the camera traps, they are confirmed present in the greater Groot/Doring system and most likely move through the area at least on occasion. The river and adjacent floodplain have been classified as Very High sensitivity and disturbance and transformation in these areas should be kept to the minimum. Buffers around the floodplain have also been included in the sensitivity mapping to ensure that noise and other disturbances are kept away from the core of the habitat. As such no additional buffers around any of the mapped features is required.

In terms of the camera trapping, a total of 12 different mammal species were captured by the cameras, as indicated in Figure B.12 and Figure B.13 below. This represents a relatively low total and does not compare favourably to other areas near the Kappa substation where camera trapping captured more than 20 different species. This low diversity and capture rate can be explained by the relative homogeneity of the site and aridity of the area compared to the wetter and more diverse landscapes near Kappa substation where several sites have been camera trapped. No Riverine Rabbits of other species of conservation concern were captured or observed at the site. In terms of the faunal community as observed by the camera traps, this is somewhat different from the other sites in the area that have been sampled, in that the Common Duiker was the most common species observed at the current site. At the majority of sites sampled nearby and in the wider Karoo more generally, the Steenbok is usually the most common species observed. Although Caracal are not very common in the area, they are conspicuously absent from the current site, which may reflect the lack of sufficient cover for this species.

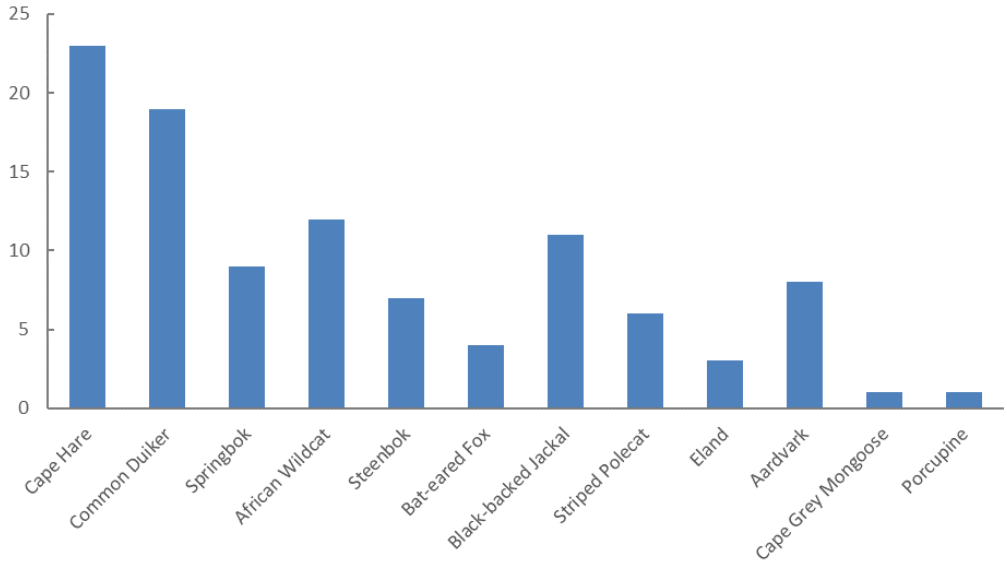


Figure B.12. Frequency of different mammals captured by the camera traps. The y-axis represents the number of cameras each species was represented at.

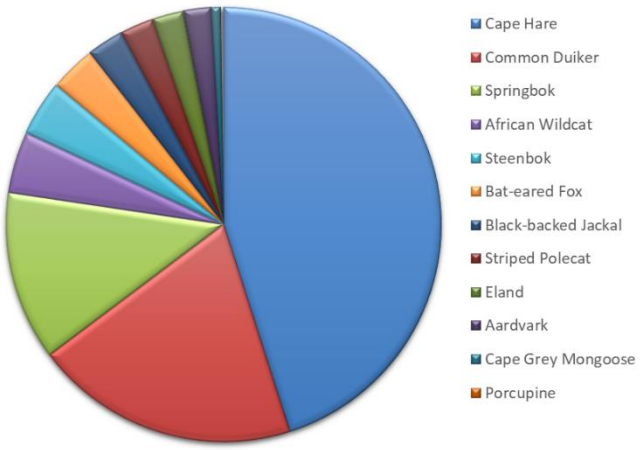


Figure B.13. Pie chart showing the relative abundance of each species recorded. The species are sorted as per the legend from most abundant to least common.

Refer to the Riverine Rabbit Habitat Assessment and Camera Trapping Survey Report for the complete record of camera trapping and the associated photographs. The Riverine Rabbit Habitat Assessment and Camera Trapping Survey Report is included as an appendix to the Terrestrial Biodiversity and Species Assessment, which is included in Appendix C.4 of the BA Report.

The Riverine Rabbit Habitat sensitivity map for the study area is depicted below in Figure B.14. The major drainage features of the site are classified as Very High sensitivity while the buffers around these features as well as areas of sub-optimal habitat are classified as High sensitivity. **The layout is considered acceptable and would likely generate low impact on the Riverine Rabbit and its associated habitats**. Although Riverine Rabbits can be found outside of riparian habitats in the southern Cape, this does not appear to be case for the current population and as such, its presence outside of these areas is seen as extremely unlikely.

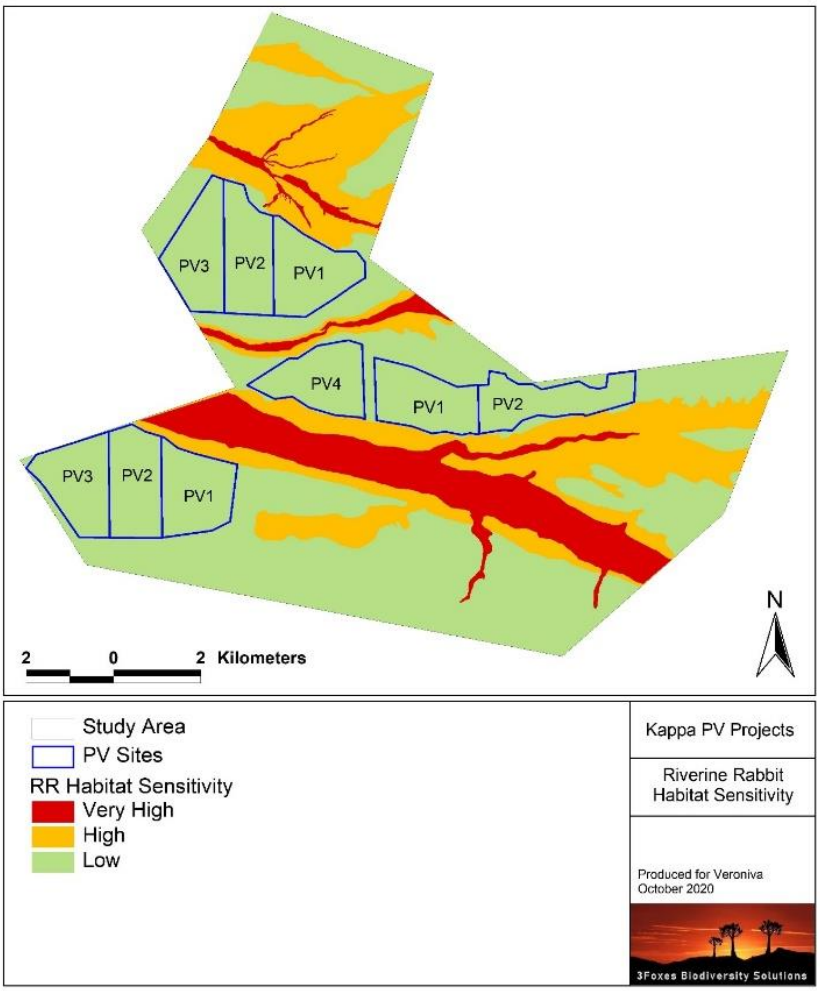


Figure B.14. Riverine Rabbit habitat sensitivity map for the study area, showing the proposed footprint areas of the PV areas (which are the subject of separate BA Reports) (Todd, 2020). Note that the proposed footprint area for Hoek Doornen PV 3 has been reduced. Refer to the Final BA Report for the Hoek Doornen PV Facilities for an updated map of the layout.

B.10 Protected Areas

According to the South African Protected Areas Database (SAPAD) and the South African Conservation Areas Database (SACAD) databases, Quarter 2 (2020), the proposed study area does not form part of any formally protected areas.

The closest protected area is the Inverdoorn Private Nature Reserve, which is located approximately 10 km away from overall project area. According to the SAPAD and SACAD, the Inverdoorn Private Nature Reserve was legally declared or designated in 1999.

The Tanqua Karoo National Park is more than 30 km to the north of the larger study area (i.e. for all nine power lines and PV facilities), and would not be affected by the proposed projects. The Touw Local Nature Reserve and Kapklip Private Nature Reserve is about 15 km from the larger study area (i.e. for all nine power lines and PV facilities), in a view shadow behind the Bontberg Mountains.

According to the Visual Impact Assessment (Appendix C.2 of the BA Report), private nature reserves and game farms in the area, some of which have guest accommodation, are important for the local tourism economy, and tend to be sensitive to loss or degradation of scenic quality. The Visual Impact Assessment (Appendix C.2 of the BA Report) notes that the Inverdoorn Private Nature Reserve, as well as the Klaserie Private Nature Reserve (which lies to the south of the larger study area, also about 10 km away) are both unlikely to be visually affected by the proposed projects. The study also notes the nearby Sadawa (Doringrivier) game farm, which also has hunting and eco-tourism activities, and guest accommodation, as well as the Wittewal game farm (located on the Witte Wall Farm) used for hunting.

According to the Avifauna Assessment (Appendix C.6 of the BA Report), the proposed development is not expected to have any impact on the avifauna in the Inverdoorn Private Nature Reserve.

The study area also does not fall within any National Protected Areas Expansion Strategy (NPAES) areas.

B.11 Avifauna

The Avifauna Assessment (Appendix C.6 of the BA Report) undertaken for the proposed project includes detailed feedback on avifauna species encountered during the site monitoring. The information provided in this section is extracted from the Avifauna Assessment (Appendix C.6 of the BA Report).

The Cedarberg - Koue Bokkeveld Complex Important Bird Area (IBA) SA101 is the closest IBA and is located approximately 16 km west of the study area. The proposed development is not expected to have any impact on the avifauna in this IBA.

The most important anthropogenic avifaunal-relevant habitat modifications currently present in the study area which could potentially influence the avifaunal community that were recorded in or close to the study area are earth dams, boreholes with water reservoirs and troughs, fences and transmission lines.

The Avifauna specialist conducted on-site surveys from 25 – 27 August 2020 (Survey 1) and 16 – 19 September 2020 (Survey 2) according to the best practice guidelines for avifaunal impact studies for solar developments, compiled by BirdLife South Africa (BLSA) in 2017 (Jenkins et al. 2017). In addition to the monitoring and variables recorded, three potential avifaunal focal points were also identified namely, two water reservoirs and a small dam.

In terms of the Southern African Bird Atlas Project 2 (SABAP 2), it is estimated that a total of 100 bird species could potentially occur in the broader area. Refer to Appendix F of the Avifauna Assessment (Appendix C.6 of the BA Report), which provides a comprehensive list of all the species, including those recorded during the pre-construction monitoring. Of these, 41 species are classified as priority species, and 17 could occur regularly in the study area. The probability of a priority species occurring regularly in the study area is indicated in Table 1 of the Avifauna Assessment (Appendix C.6 of the BA Report).

The abundance of priority species (birds/km) recorded during the walk transects undertaken by the Avifauna Specialists is displayed in Figure B.15 below.

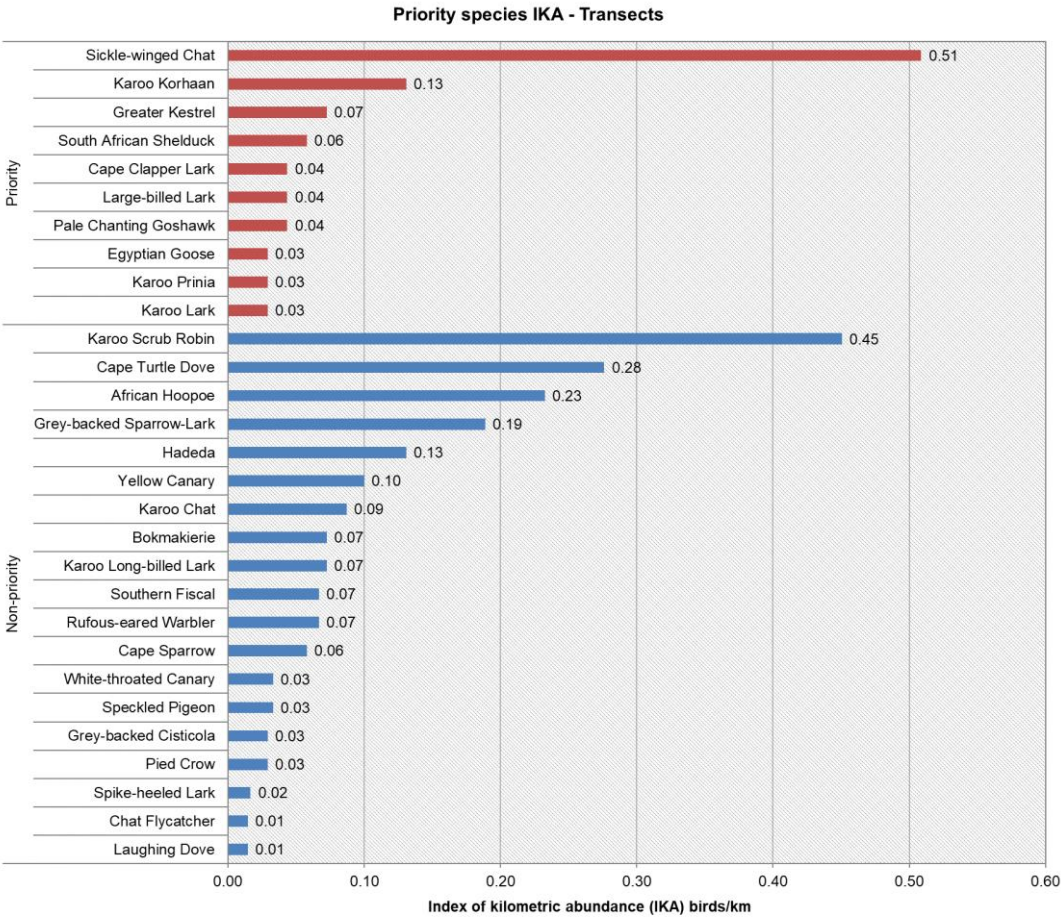


Figure B.15. The abundance of priority species recorded during transect counts (van Rooyen and Froneman, 2020).

The species which were recorded by the Avifauna specialist at the three focal points are listed in Table B.2 below

Table B.2. Species recorded at focal points. Priority species are shaded in red.

Focal Point 1	Focal Point 2	Focal Point 3
Karoo Chat	Karoo Korhaan	Brown-throated Martin
Speckled Pigeon	Karoo Chat	Pearl-breasted Swallow
Cape Sparrow	Cape Wagtail	Pied Avocet
Southern Fiscal	Egyptian Goose	South African Shelduck
Yellow Canary	Malachite Sunbird	Three-banded Plover
Karoo Lark	Yellow Canary	Yellow Canary
Bokmakierie	Pied Crow	
Cape Bunting	Cape Turtle Dove	
Malachite Sunbird		
Grey Tit		
Southern Double-collared Sunbird		
Lark-like Bunting		
White-throated Canary		

Figure B.16 also lists the priority species which were recorded by the Avifauna Specialist on site during the survey as incidental records.

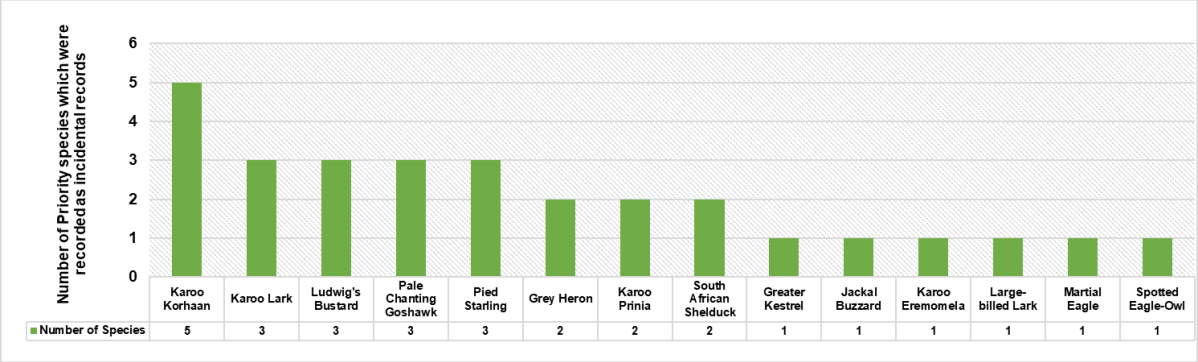


Figure B.16. Priority species which were recorded as incidental records (Adapted from van Rooyen and Froneman, 2020).

The Avifauna Specialist concluded that the overall abundance of priority species at the study site was low, with an average of 0.83 birds/km recorded during transect counts. For all birds combined, the index of kilometric abundance (IKA) for transect counts was 8.45 birds/km, which is moderate. The low numbers are not surprising, given the general aridity of the habitat.

In terms of the Screening Tool, there is no specific powerline theme for avifauna, and the study area is classified as mostly medium sensitivity for Animal Species Theme, with small areas of low and high sensitivity. The medium sensitivity rating is linked to the presence of Ludwig's Bustard. The High and Low sensitivity ratings are not linked to avifauna.

The site investigation revealed that the sensitivity rating of medium sensitivity is accurate for avifauna, but there are also areas of high sensitivity, namely water reservoirs, drainage lines and earth dams which do not appear in the Screening Tool. These are discussed below:

- High sensitivity (Mitigation required): Surface water: Included are areas within 300 m of water troughs and earth dams, and all major drainage lines. Surface water in this arid habitat is crucially important for priority avifauna, including several Red Data species such as Martial Eagle, Lanner Falcon and Black Harrier, and many non-priority species. Drainage lines when flowing also attract waterbirds on occasion, as do the large pools that remain in the channel after the flow has stopped. Power lines that are routed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing, and drainage lines, when flowing, are natural flight paths for birds. If a power line has to be routed across a high sensitivity zone, mitigation in the form of Bird Flight Diverters will be required.
- Medium sensitivity (Mitigation potentially required): Succulent Karoo: The entire study area is rated as medium sensitivity due to the regular presence of collision-prone species such as Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan.

There are no breeding areas for vultures and Blue Cranes in the power line corridor.

Refer to Figure B.17, B.18 and B.19 for the Avifauna sensitivities identified by the specialist.

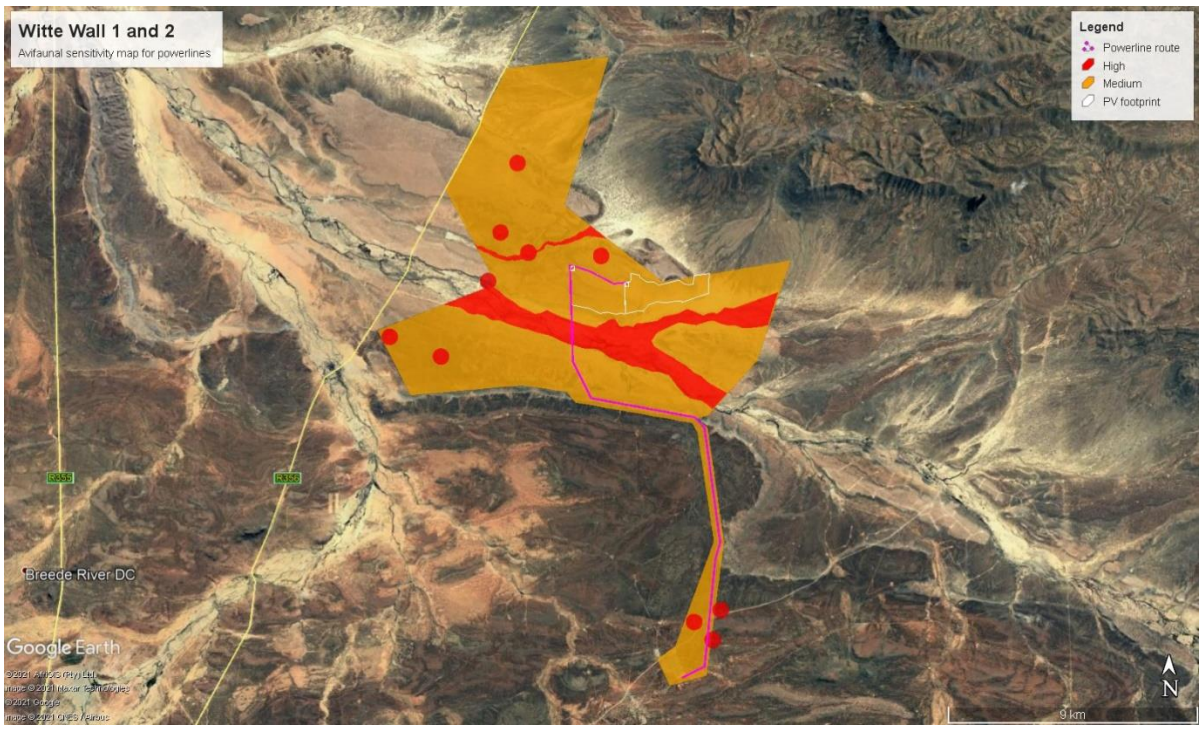


Figure B.17. Avifaunal sensitivities (for the powerlines) supporting the Witte Wall PV Facilities (van Rooyen and Froneman, 2020).

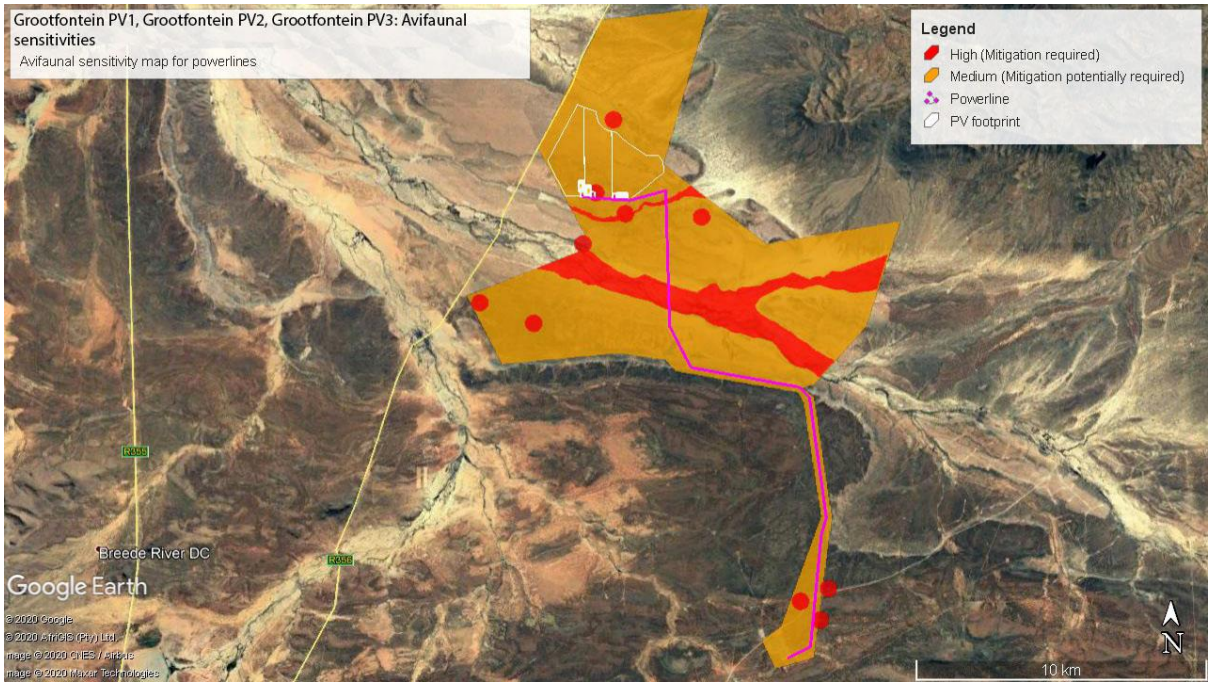


Figure B.18. Avifaunal sensitivities (for the powerlines) supporting the Grootfontein PV Facilities (van Rooyen and Froneman, 2020).

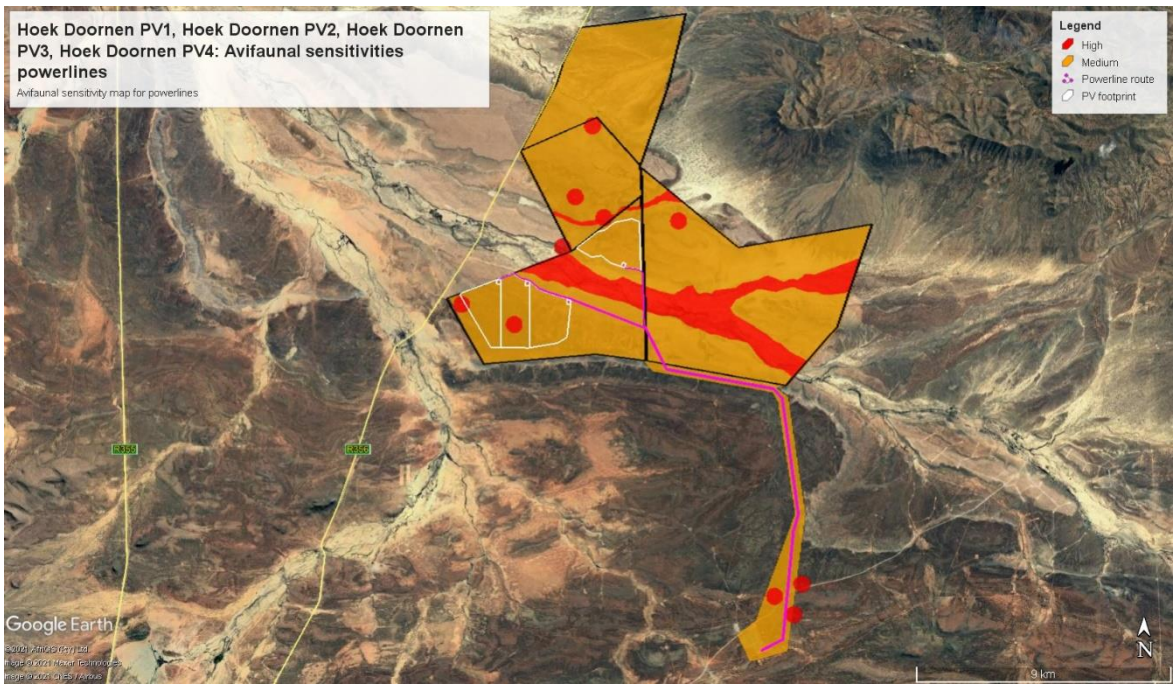


Figure B.19. Avifaunal sensitivities (for the powerlines) supporting the Grootfontein PV Facilities (van Rooyen and Froneman, 2020).

B.12 Visual Aspects and Sensitive Receptors

The Visual Impact Assessment is included in Appendix C.2 of the BA Report, and includes details on landscape and sensitive receptors. The information provided in this section is extracted from the Visual Impact Assessment.

The Visual Impact Assessment provides information on landscape, geology, and vegetation, as described above, as well as other aspects such as land use and sensitive receptors.

In terms of land use, the relatively low rainfall and sparse vegetation limit the agricultural potential to mainly extensive grazing, including sheep, interspersed with game farms. Crops are confined to the minor patches of deeper soils along drainage courses or where irrigation is available. Farms tend to be large in area in order to be viable for sheep or game farming, with farmsteads being on average 5 to 10 km apart. The Eskom Kappa substation is located about 12 km to the south of the site. The substation and Eskom 400 kV power lines, together with the existing Perdekraal wind farm to the south-west have already resulted in visual intrusions in the local area.

In terms of sensitivities, the Screening Tool contains the Relative Landscape (Solar) Theme Sensitivity, which is indicated in Figure B.20 below. The Screening Tool shows that the sites for the EGI are mainly sensitive from a drainage line perspective.

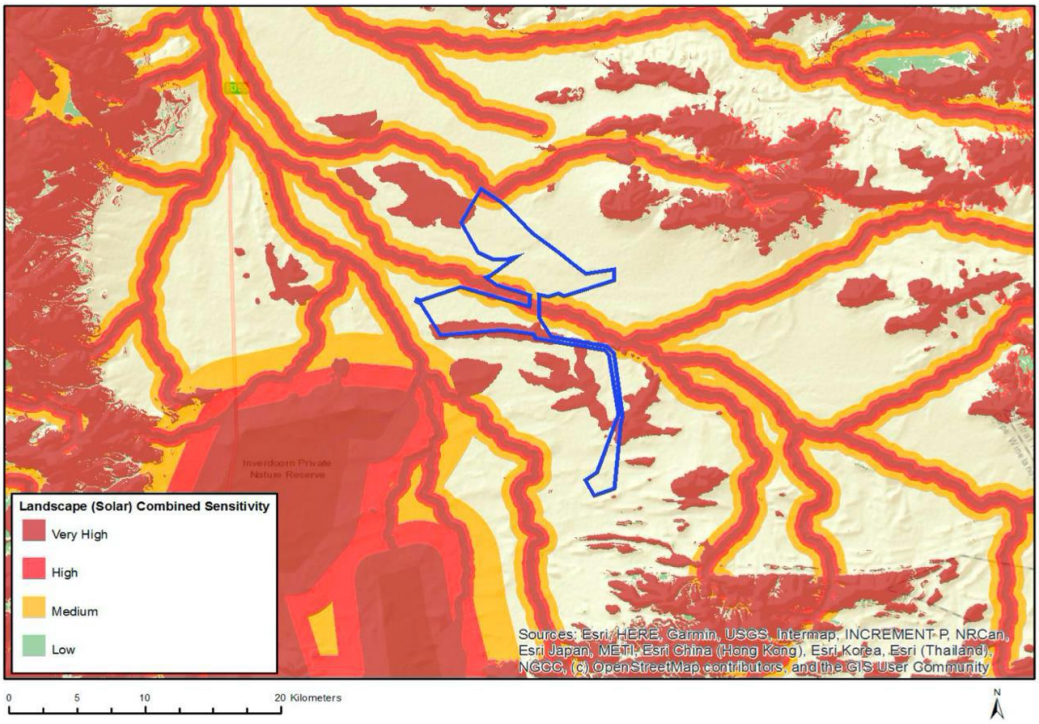


Figure B.20. Landscape (Solar) Combined Sensitivity as depicted on the Screening Tool.

The current visual sensitivity mapping undertaken in the Visual Impact Assessment is in greater detail at the site scale, and takes into account detailed viewshed mapping and local site conditions, as indicated in Figures B.21, B.22 and B.23. The four-tier sensitivity map of the study area, from a visual perspective, which shows very high, high, medium and low sensitivities, is included in Figures B.21, B.22, B.23 below.

In terms of the scenic resources and landscape features within or adjacent to the proposed project site, the following has been identified by the Visual Specialists:

- **Topographic features**: These are landscape features in the area, such as hills, koppies and outcrops which contribute to scenic and natural heritage value, providing visual interest or contrast in the landscape. The actual feature is rated as Very High sensitivity, and High sensitivity is allocated to within 150 m of the feature. Slopes more than 1:4 are rated as High sensitivity.
- **Water features**: As noted above, in places, rivers have been carved into the softer Ecca shales, such as the Droëlaagte River, Groot River and Doring River, which traverse the study area. In the arid landscape, drainage features with riverine thicket and dams provide scenic and amenity value. The actual drainage features are rated as Very High sensitivity and High sensitivity is allocated to the area within 50 m.
- **Cultural landscapes**: Intact wilderness or rural landscapes contribute to scenic value and sense of place, along with green patches of cultivated land and tree copses around farmsteads. Cultural landscapes include archaeological and historical sites as identified in the Heritage Impact Assessment (Appendix C.3 of this BA Report). Very High sensitivity is allocated within 100 m of the feature; and High sensitivity is allocated within 150 m of the feature.

In terms of the receptors adjacent to the site or in the local surroundings, the following has been identified by the Visual Specialists:

- **Protected Areas**: As noted above, the Tanqua Karoo National Park is more than 30 km from the study area, and would not be affected by the proposed projects. The Touw Local Nature Reserve is about 15 km from the site, in a view shadow behind the Bontberg Mountains.

- **Private nature reserves and game farms**: Private nature reserves and game farms in the area, some of which have guest accommodation, are important for the local tourism economy, and tend to be sensitive to loss or degradation of scenic quality. The Inverdoorn Private Nature Reserve facilities to the south-west are about 10 km from the project site. The Klaserie Private Nature Reserve to the south is a similar distance from the site and both are unlikely to be visually affected by the proposed projects. Sadawa (Doringrivier) and Wittewal game farms have also been identified. The impact on the nearby Sadawa game farm is described further in the Visual Impact Assessment for the Hoek Doornen PV projects. Very high sensitivity was allocated to the private reserve and game farm itself, High sensitivity is within 250 m, and Medium sensitivity is within 500 m.

- **Human settlements and farmsteads**: Surrounding farmsteads are widely spread and tend to be 5 km or more from the project sites. It is assumed that farms that form part of the leased development site are less visually sensitive. Farmsteads outside site have a sensitivity allocated as Very high within 50 m and High within 100 m. Farmsteads inside site have a sensitivity allocated as Very high within 50 m and High within 100 m.

- **Scenic or arterial routes**: The R355, which runs north to the Tanqua Karoo and Calvinia, and which is some 12 km away, would not be in the viewshed of the proposed projects. The R356 runs north-east in the direction of Sutherland and abuts the study area for several kilometres. This stretch would probably not be considered a scenic route, but would require a nominal visual buffer. Within 50 m of the scenic or arterial routes are allocated as Very High sensitivity, and within 100 m is rated as High sensitivity.

- **Cultural and heritage sites**: These form part of the Heritage Impact Assessment (Appendix C.3 of this BA Report), but could have visual implications.

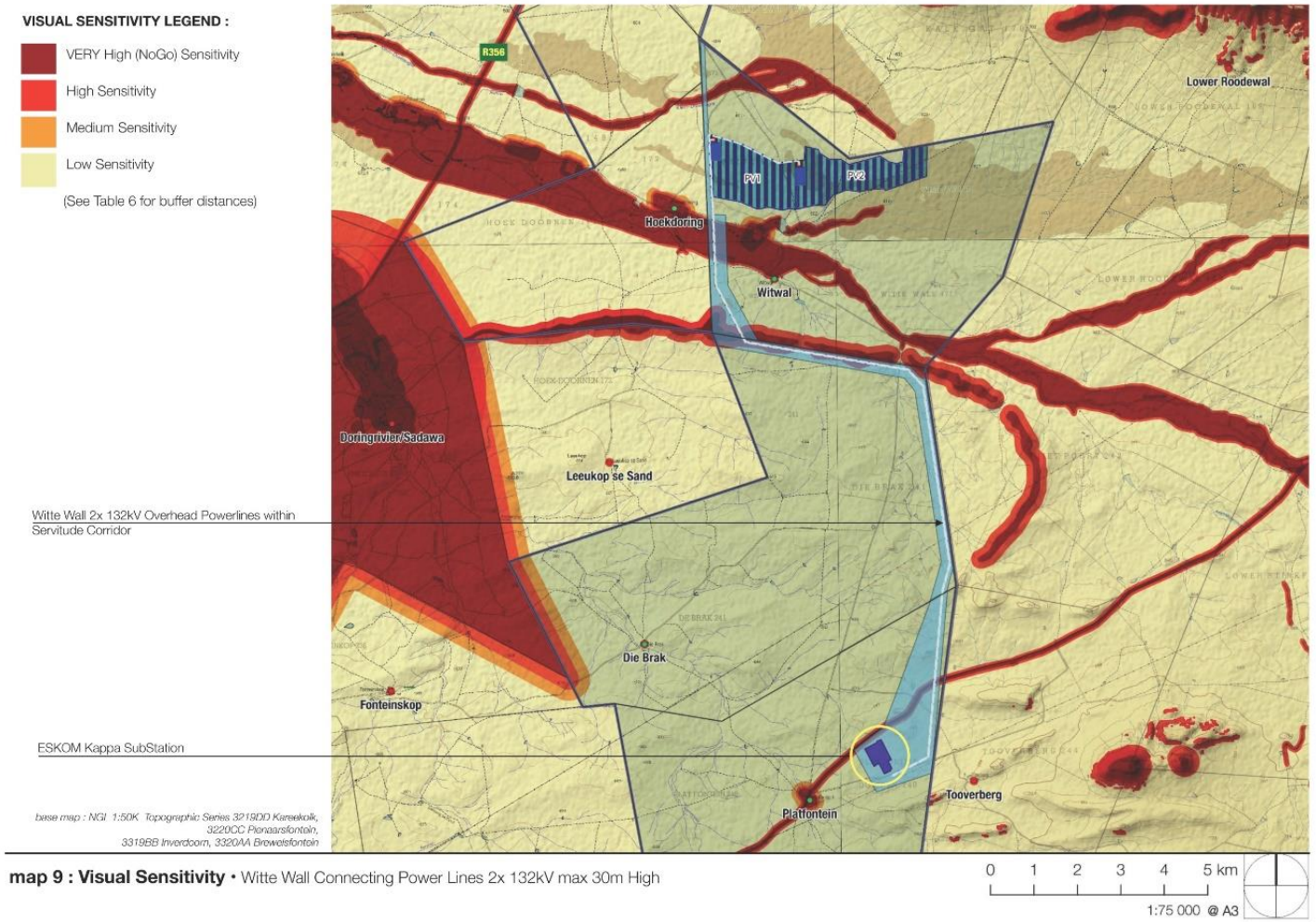


Figure B.21. Detailed Sensitivities identified by the Visual Specialists for Power Lines associated with the Witte Wall PV Facilities.

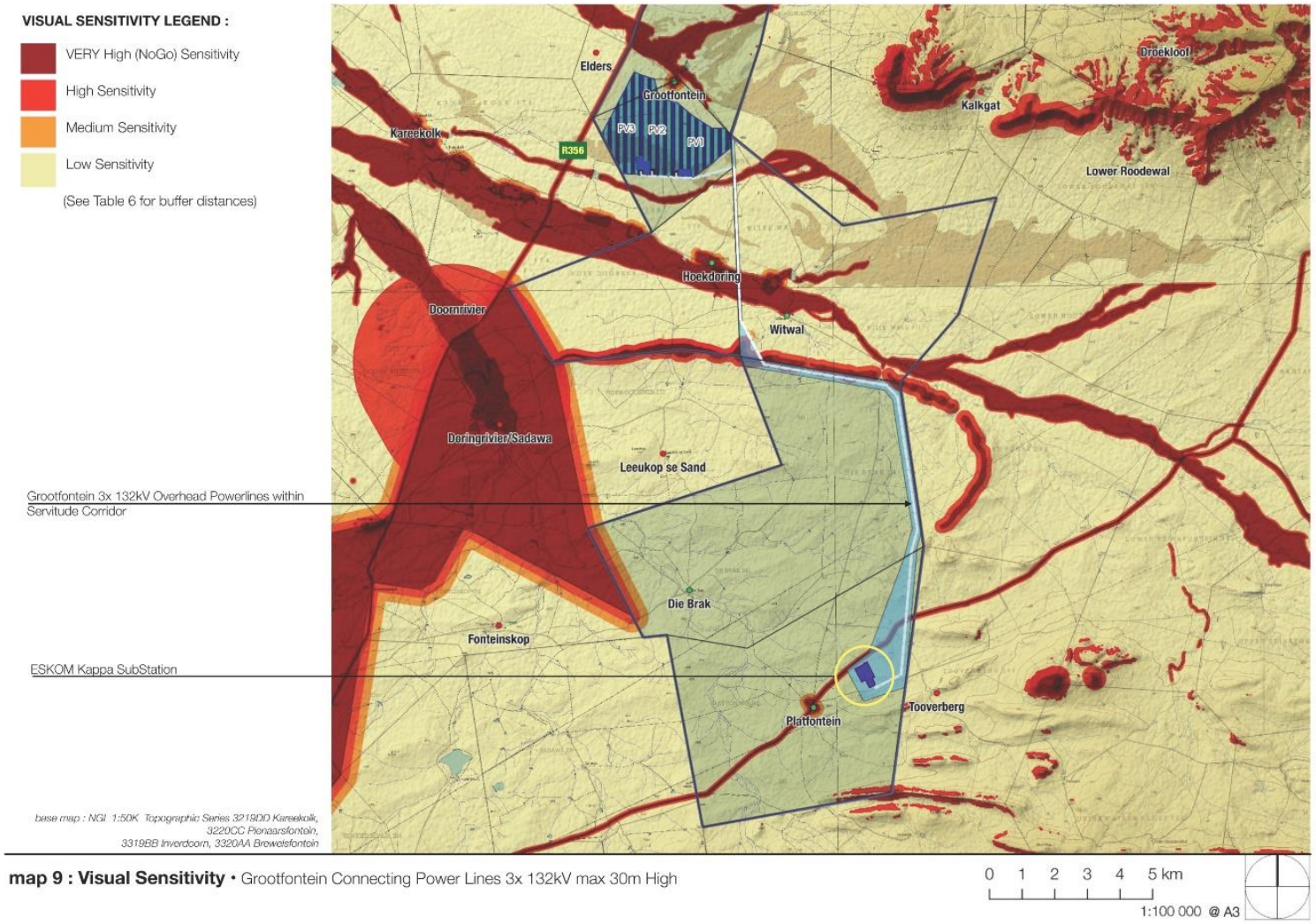


Figure B.22. Detailed Sensitivities identified by the Visual Specialists for Power Lines associated with the Grootfontein PV Facilities.

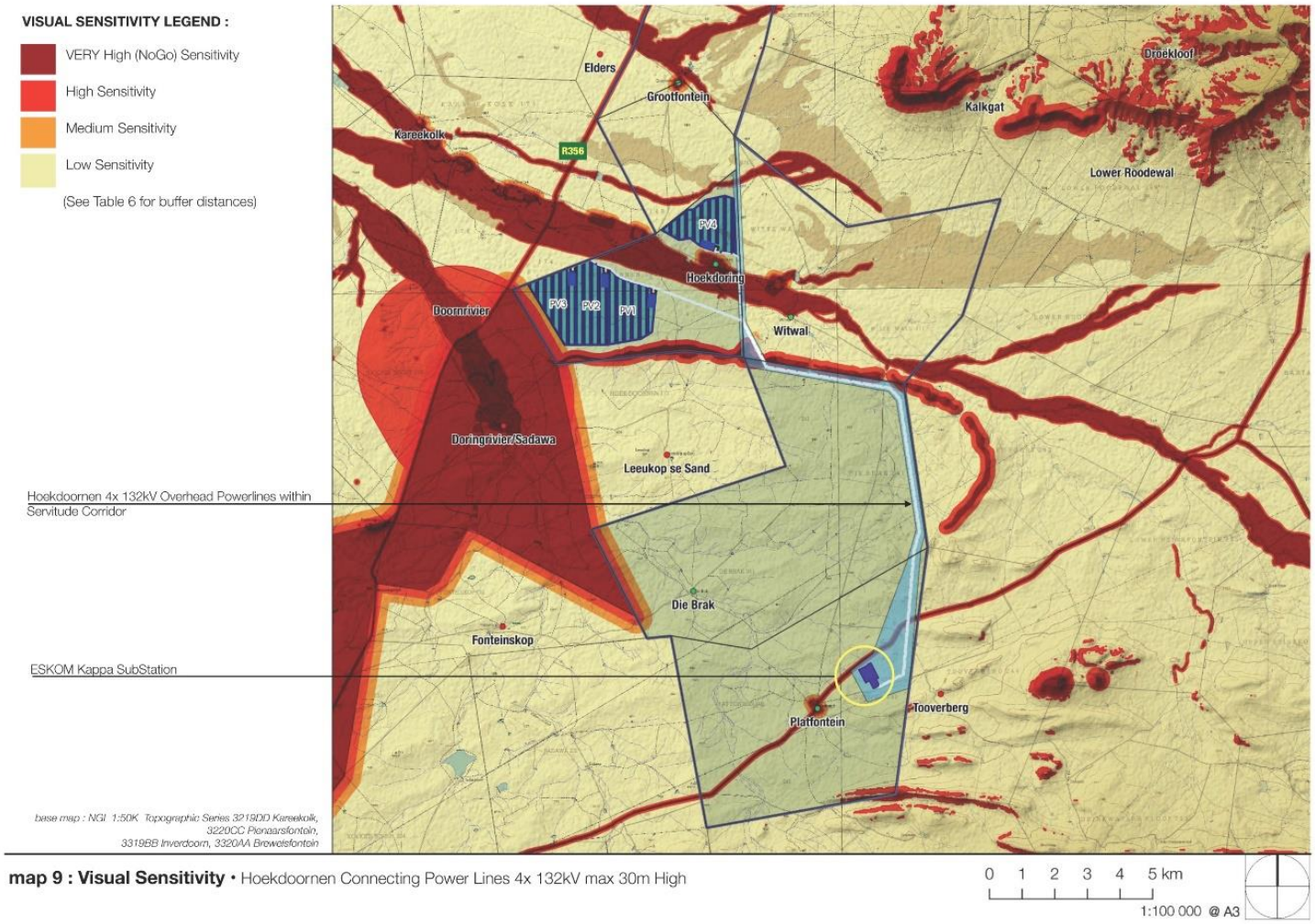


Figure B.23. Detailed Sensitivities identified by the Visual Specialists for Power Lines associated with the Hoek Doornen PV Facilities.

The visual sensitivities described above and in Figures B.21, B.22, and B.23 correspond roughly with the Screening Tool sensitivities, the former being more detailed and specific to the study area.

B.13 Heritage: Archaeology and Cultural Landscape

A detailed description of the archaeological features and cultural landscape within the study area is included in the Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape), which is included in Appendix C.3 of this BA Report. The information presented in this section is based on the Heritage Impact Assessment.

In terms of the desktop phase of the Heritage Impact Assessment, Halkett and Webley (2011) located many light scatters of artefacts in an area to the southeast of the present study area and focused along the margins of streams. The vast majority were considered to be Middle Stone Age (MSA) with far fewer relating to either the Early (ESA) or Late (LSA) Stone Ages. A few bifacial pieces seemed likely to be ESA handaxes though. Orton (2008) worked at the southern end of the present power line corridor and located a number of light scatters of artefacts. Most were MSA artefacts but one small scatter was strongly dominated by LSA artefacts. A single willow pattern ceramic (plate) fragment was also found.

Towards the east and into the foothills of the escarpment, Smuts (2018) found stone artefacts to be far rarer than out on the plains but also noted that what was present was focused along rivers. Smuts (2018) also recorded a rock shelter with finger paintings and a single pot sherd. A subsequent visit to this site by the Heritage Specialist showed it to contain a good deposit with many stone artefacts, some grindstones, a grooved stone, many finger-painted images on the rear wall and a string of five *Nassarius kraussianus* shell beads. These are estuarine shells that had to have been brought to the site from the coast.

A site visit was also undertaken by the specialists in September 2020. Table 1 of the Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape), included in Appendix C.3 of this BA Report, provides a list and description of all heritage resources recorded during the ground survey. Not recorded are the very large number of isolated Stone Age artefacts seen throughout the study area (except for ESA bifaces and LSA lower grindstones which were recorded). These isolated artefacts are what are commonly referred to as background scatter, their distribution having been conditioned more by natural forces than anthropogenic ones (Orton 2016). They are dominated by MSA artefacts but ESA and LSA artefacts were also frequently seen.

The following conclusions were made in the Heritage Impact Assessment:

- **Witte Wall PV and EGI Area**: There are currently no areas within the PV layouts or power line corridors that require avoidance but there is a possible grave at waypoint 150 alongside an existing farm track to the south of the PV layouts that, for precautionary reasons, should be protected and avoided with a 30 m buffer.
- **Grootfontein PV and EGI Area**: There are currently no areas within the PV layouts or power line corridors that require avoidance, but it should be noted that a highly significant archaeological site lies immediately beyond the northern study area boundary at waypoint 177. Although the current farm road crosses the edge of the 30 m buffer, it is acceptable that this road may be used by the project so long as the fence is not moved.
- **Hoek Doornen PV Project Area and EGI Corridor**: There are currently no areas within the PV layouts or power line corridors that require avoidance, but it should be noted that a stone

boundary beacon occurs alongside the current access to the southern part of the farm at waypoint 132. It is acceptable that this road may be used by the project so long as any widening happens northwards, away from the beacon.

B.13.1 Screening Tool Descriptions and Site Verification

Figure B.24 indicates the archaeological and heritage sensitivity as captured on the Screening Tool. The screening tool map shows parts of the power line corridor to be of medium sensitivity. However, only sites of low cultural significance were found in the areas examined and there is little reason to believe that this would change with further survey. The nature of the archaeological resources along the area shown in the screening tool map as of medium sensitivity is such that it is an extensive resource with low cultural significance.

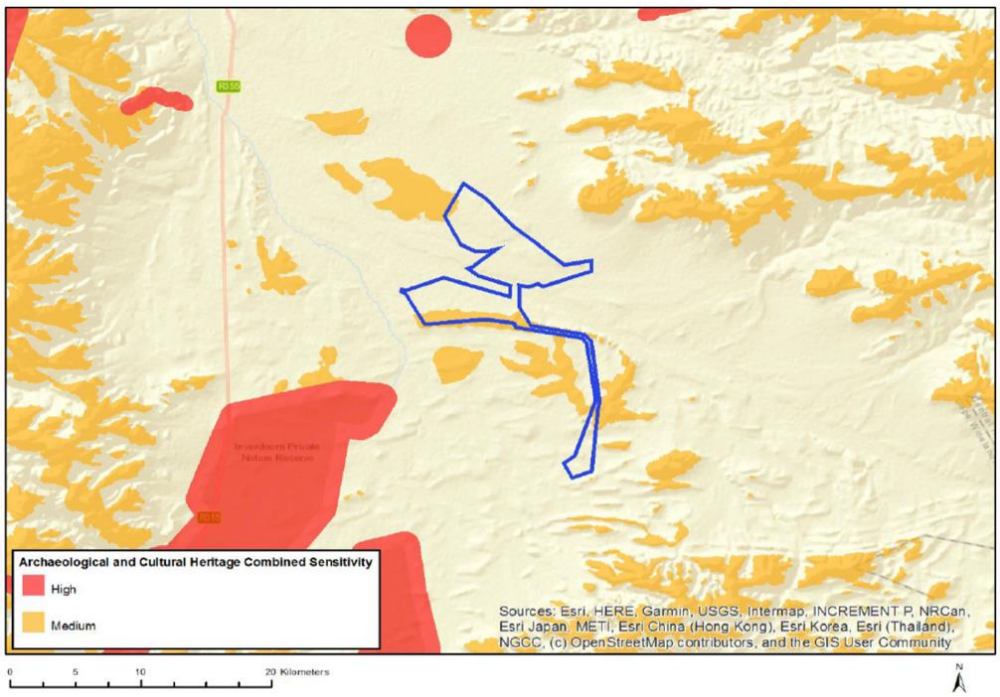


Figure B.24. The Screening Tool map for Archaeology and Cultural Heritage Combined Sensitivity for the proposed development area (note that one map has been generated for the all nine PV Facilities and the EGI corridor).

B.14 Palaeontology

A detailed description of the palaeontological features within the study area is included in the Heritage Impact Assessment (Archaeology, Palaeontology and Cultural Landscape), which is included in Appendix C.3 of this BA Report. The information presented in this section is based on the Palaeontology Assessment.

The South African Heritage Resources Information System (SAHRIS) Palaeosensitivity map shows the study area to be of medium to high sensitivity.

Almond (2020) notes that the project area is situated on a pediment surface of Neogene to Pleistocene age that has been planed off by river erosion. Beneath a thin capping of alluvial gravels, calcrete hardpans, sandy soils and downwasted surface gravels are Tierberg Formation (Ecca Group) sediments of Middle Permian age. They are weathered, folded and often tectonically-cleaved. The only fossil remains recorded from such pediment settings in the Ceres Karoo comprise (1) sparse, generally small blocks of reworked silicified fossil wood within alluvial and surface gravels of uncertain provenance (probably Ecca Group) and (2) occasional calcretised fossil termite nests of probable Pleistocene age that are found embedded within calcretised superficial sediments as well as weathered, calcrete-veined bedrocks. The majority of fossil sites recorded fall within designated No-Go areas lying outside the project footprint. These fossils are of widespread occurrence within the Ceres Karoo region and are not of high scientific interest or conservation value. No fossil sites of high sensitivity or No-Go areas were identified within the project areas during the palaeontological field survey and the palaeontological sensitivity of the project area is assessed as generally **LOW**.
In terms of Section 38(3)(b) of the NHRA the palaeontological resources are deemed to have low cultural significance for their scientific value. Any fossils found are likely to be in the Grade IIIB to NCW range.

Figure B.25 provides a satellite image of the solar PV facility project areas (yellow polygons) with associated power lines (pink) in the corridor linking to the existing Eskom Kappa Substation. The numbered squares show new fossil sites, most of which are associated with drainage line exposures falling in No-Go areas outside the project footprint. None of these sites (which represent only a small fraction of potential fossil sites in the area) are considered to be of high scientific or conservation value and no recommendations for their mitigation are proposed.

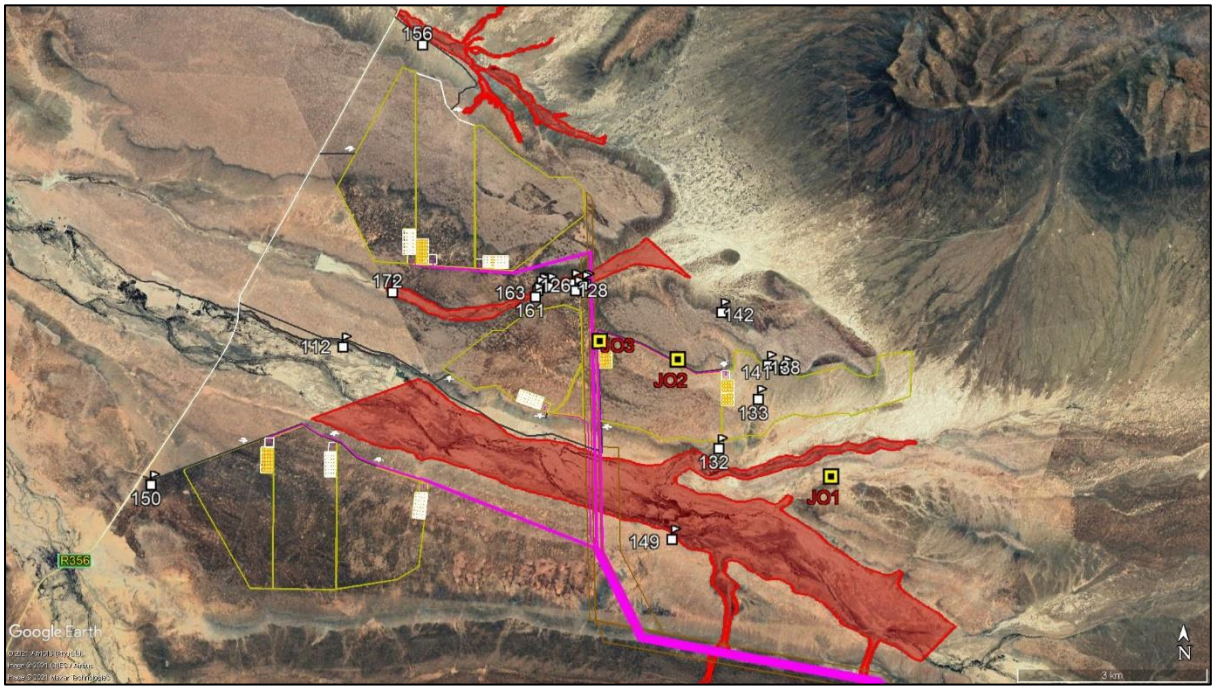


Figure B.25. Palaeontology Sensitivity Map for the larger study area.

B.14.1 Screening Tool Descriptions and Site Verification

On the basis of information sources listed previously, the Screening Tool palaeosensitivity map in Figure B.26 is disputed. The main reasons for this are:

- The inaccurate overlay of the project area on the palaeosensitivity map (which is based primarily on the relevant geological maps).
- The Dwyka Group (indicated in red) is generally regarded as of LOW palaeosensitivity whereas the Tierberg Formation is of MEDIUM sensitivity, at most. Field data for the proposed project suggest a LOW palaeosensitivity for the Tierberg Formation outcrop area here due to weathering and extensive cover by low-sensitivity calcrete, gravels and soils.
- Potentially-sensitive rock units such as the basal Prince Albert Formation and Whitehill Formation are not rated as high sensitivity on the map (Field data suggests these are generally of LOW palaeosensivity in this region, mainly due to weathering and cleavage development).
- The map does not address the Late Caenozoic sediments that mantle the bedrocks in the project area, and in particular the pediment gravels (ancient alluvium) underlying almost the entire solar PV study areas as well as younger alluvium along the Groot River and its tributaries. Almost all the new fossil occurrences noted during the recent field survey were found in such settings. However, these fossils are of low conservation value and the palaeosensitivity of the Late Caenozoic sediments is according rated as LOW.

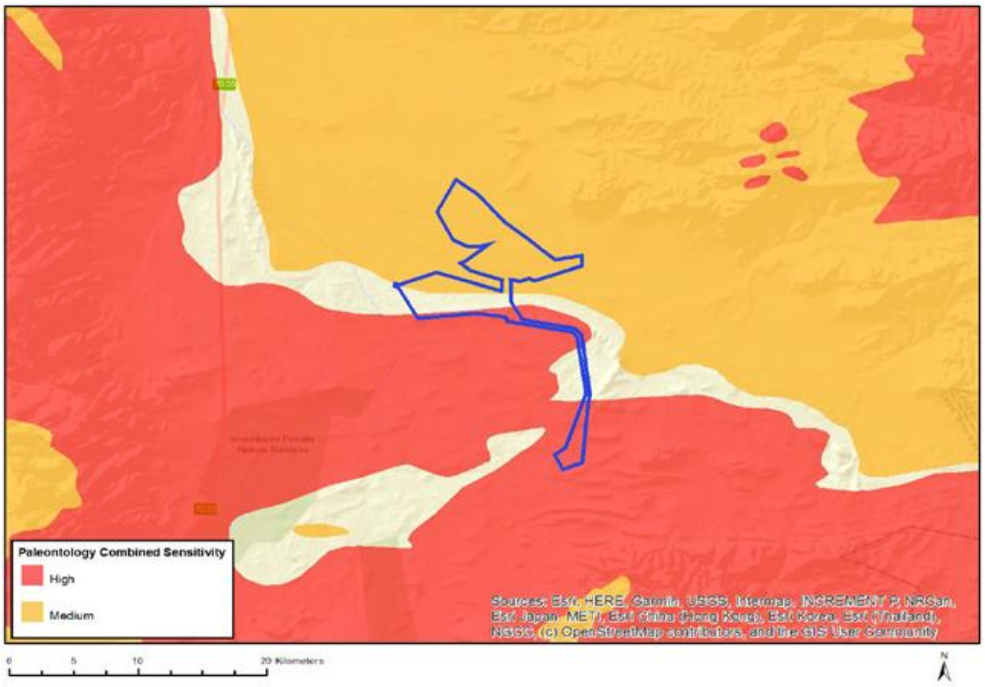


Figure B.26. The Screening Tool map for Palaeontology Combined Sensitivity for the proposed development area (note that one map has been generated for the all nine PV Facilities and the EGI corridor).

As noted above, it is concluded that the entire combined project area for the proposed solar PV facilities and EGI corridor is in practice of LOW palaeosensivity. Potentially fossiliferous rock units underlying the project footprint such as the Prince Albert and Whitehill Formations are too weathered and tectonically deformed (cleaved) to contain scientifically valuable fossils in the project area.

B.15 Socio-Economic Character

The information provided below has been extracted from the Socio-Economic Assessment, which is included in Appendix C.7 of this BA Report.

This Socio-Economic Assessment covers the individual land parcels on which the proposed projects will be developed if approved, the surrounding area, known as the Ceres Karoo (of which the land parcels are a part), and the nearest towns, Touws River and Ceres, as the anticipated socio-economic impacts will be spread to varying degrees across these localities. While Touws River falls within the Breede Valley Local Municipality (BVLM), the project sites and Ceres fall within the Witzenberg Local Municipality (WLM). The study area falls within the Cape Winelands District Municipality (CWDM).

The BVLM has a population of 186 796 (estimates in 2018), making it the second most populated municipal area in the CWDM (BVLM IDP Review 2020 – 2021 citing Stats SA Community Survey 2016). The BVLM area comprises 47 569 households of which approximately 14,7% (7 000) are classified as indigent. The BVLM's 2020 average household size is 3,8 persons. (2019 Socio-economic Profile: BVLM). It is worth noting that although the number of households in the area is increasing, the actual size of households is trending downwards. This potentially implies an inflow of young professionals (either single, as couples or with small family groupings) into the area as a result of enhanced urbanisation. Other contributing factors include, but are not limited to, lower fertility rates, occurrences of divorce, ageing population, etc. (2019 Socio-economic Profile: BVLM). In 2016, Touws River actual population stood at 8 768 persons. (Stats SA Community Survey 2016).

The WLM has a population of 140 124, comprising 35 976 households (based on 2018 and 2016 data, respectively). The average household size is 3,6 persons. (2018 Socio-economic Profile: WLM). In 2016, Ceres actual population stood at 36 043 persons. (Stats SA Community Survey 2016).

According to a 2014/15 survey, 34 074 people live and or work on farms in the Cape Winelands area. Witzenberg had the highest number of households (2482) and individuals (8181), followed by Breede Valley, which contained 1005 households and 4222 individuals (Western Cape Government Farmworker Household Survey Report 2014/15).

Table B.3 depicts the BVLM and WLM population composition per age cohorts. These groupings are also expressed as a dependency ratio which indicates the number of people supported by each economically active person. A higher dependency ratio means a more vulnerable community, higher pressure on social systems and the delivery of basic services.

Table B.3. Demographic profile of Breede Valley and Witzenberg by age cohort (2019 Socio-economic Profile: BVLM; 2018 Socio-economic Profile: WLM).

Year	Children: 0 – 14 Years	Working Age: 15 – 65 Years	Aged: 65+	Dependency Ratio (%)
Breede Valley: Age Cohorts, 2019 - 2025				
2019	55 143	121 646	10 007	53.6
2022	56 671	125 281	11 199	54.2
2025	58 057	128 072	12 056	54.7
Growth	0.9%	0.9%	3.2%	-
Witzenberg: Age Cohorts, 2011 - 2024				
2011	29 460	81 634	4 849	42.0
2019	34 457	100 049	8 974	43.4
2024	36 098	112 780	11 143	41.9
Growth	Not available			

In 2019, the population density in BVLM was 49 people/km² while the WLM had only 13 people/km² (2019 Socio-economic Profile: BVLM).

In terms of education, only 40,8% of children in the BVLM and 42,6% of children in the WLM aged 0–5 years attend an educational institution. In real terms, this means that 10 965 children in the BVLM and 8100 children in the WLM are not benefitting from early childhood education. However, the distribution of the population aged 5–24 years attending an educational institution increases in both the BVLM and WLM to 57,8% and 63% respectively. This represents a drop in this population attending an educational institution in BVLM from 67,8% and an increase in WLM from 61,3% in 2011.

Household income an indicator of current poverty levels and provides information about the living standards prevalent in a particular community. A community's ability to meet their basic needs is determined by the level of household income. Table B.4 provides the household income distribution in the CWDM, BVLM and WLM.

Table B.4. Household income distribution (WLM Amended IDP 2017 – 2022).

Income Category	Cape Winelands	Witzenberg	Drakenstein	Stellenbosch	Breede Valley	Langeberg	
No income	13.1	6.4	12.8	20.4	12.0	10.0	
R1 - R6 314	1.9	1.7	1.8	2.0	1.7	2.5	
R6 315 - R12 628	3.5	4.0	3.2	3.5	3.1	4.3	Low Income
R12 629 - R25 257	13.4	18.7	10.7	10.6	15.2	15.8	
R25 258 - R50 514	20.1	25.8	17.1	16.6	21.8	24.3	
Subtotal	**51.9**	**56.6**	**45.5**	**53.1**	**53.8**	**57.0**	
R50 515 - R101 028	18.4	20.6	18.7	15.5	18.6	19.8	
R101 029 - R202 055	12.3	10.6	13.9	11.6	12.7	10.8	Middle Income
R202 056 - R404 111	8.8	6.8	10.7	8.5	8.5	7.3	
Subtotal	39.4	38.0	43.2	35.6	39.8	38.0	
R404 112 - R808 221	5.7	3.9	7.6	6.5	4.7	3.6	
R808 222 - R1 616 442	2.0	1.1	2.5	3.3	1.0	1.0	
R1 616 444 - R 3 232 885	0.5	0.3	0.6	1.0	0.3	0.2	High Income
R3 232 886+	0.4	0.2	0.4	0.7	0.3	0.2	
Subtotal	**8.6**	**5.4**	**11.2**	**11.4**	**6.4**	**5.0**	

As noted above, the majority of households in the BVLM (53,8 %) fall under the low-income brackets. This could indicate that an increasing number of households find it difficult to survive and will ultimately become dependent on social assistance in the form of social grants in the absence of targeted sustainable employment creation programmes (BVLM IDP Review 2020-2021). Within the CWDM, the WLM had the lowest level of households without income (6.4%) but the second highest level of low-income earners (56.6%), followed by the BVLM (53.8%).

In terms of basic services, the vast majority of households in the BVLM and WLM live in formal dwellings, have piped water inside or within 200m of their dwelling, use electricity for lighting, have a flush or chemical toilet, and at least weekly refuse removal (2019 Socio-economic Profile BVLM; 2018 Socio-economic Profile WLM). One of the most important indicators of backlogs in service delivery is provided through examining the number of people living in informal settlements. In the BVLM and WLM, 4% and 5% of the population respectively live in informal areas both of which are above the national average of 3,2% (Municipal Capacity Assessment 2018). The BVLM and WLM do not provide basic services to rural communities, including farm dwellers. Basic services are provided by the land owner with Eskom providing bulk electricity provision. The 2014/15 survey found that approximately

90% of the farmworker households have piped water, electricity, and flush toilets. Water is provided free to 90% of the farmworkers living on farms across the regions while refuse and sanitation service are free for all farmworkers (Western Cape Government Farmworker Household Survey Report 2014/15).

In terms of economic performance, in 2017, the BVLM local economy was dominated by the finance, insurance, real estate and business services (R2.506 billion; 20%); wholesale and retail trade; catering and accommodation (R2.307 billion; 18.4%); and manufacturing (R1.705 billion; 13.6%) sectors. Combined, these top three sectors contributed R6.518 billion (or 51.8%) to the area's economy. The 10-year trend shows the economy grew by an average annual rate of 2.5%, but tapered off significantly to 1.7% in more recent times (2014 to 2018). From 2008 to 2017, the finance, insurance, real estate, and business services sector registered the highest average growth rate (5%), followed by the construction (5%) and the wholesale and retail trade; catering and accommodation (3%) sectors. Growth in the agriculture, forestry, and fishing sector was robust at 10% in 2017. However, the sector was estimated to contract by 3.9% in 2018 as the effects of the drought intensifies (BVLM IDP Review 2020-2021; 2019 Socio-economic Profile BVLM).

In 2016, the WLM local economy was dominated by the wholesale and retail trade, catering and accommodation sector (R1.4 billion or 17.4%), followed by the finance, insurance and real estate, and business services sector (R1.3 billion or 15,9%); agriculture, forestry and fishing sector (R1.2 billion or 15.2%); manufacturing (R1.2 billion or 14%) and general government (R928.9 million or 11%). Combined, these top five sectors contributed R6.1 billion (or 74%) to the WLM municipal economy, which was estimated be worth R8.2 billion in 2016. The 10-year trend, between 2006 and 2016, showed that the construction sector registered the highest average growth rate (9%) in Witzenberg during this period, followed by the finance and business services sector (7.7%), general government (5.8%); community and social services (5.3%) and wholesale trade (5%). It is concerning that sectors with a significant contribution to the economy, such as agriculture (15%) and manufacturing (14%), registered the lowest growth rates in the period, 2.5% and 2.9% respectively. Growth of the agriculture sector shrunk into negative territory in 2015 and 2016 due to the severe drought but the estimated growth rate for 2017 was a healthy 6% (2018 Socio-economic Profile WLM).

In terms of unemployment, in 2018, the unemployment rate, referring to individuals without work, but actively seeking work in a recent past period (usually four weeks), and are currently available for work, was 14,4% in the BVLM and 7,6% in the WLM. The youth unemployment rate is a serious problem in both areas and has reached 20% in the BVLM and 9,9% in the WLM. The youth unemployment rate refers to unemployed individuals aged 15 – 24 who are without work, actively seeking work in a recent past period (past four weeks), and currently available for work (BVLM Municipal Capacity Assessment 2018; WLM Municipal Capacity Assessment 2019).

The proportion of formal to informal employment is 25,5% in the BVLM and 17,4% in the WLM. Informal employment identifies persons who are in precarious employment situations irrespective of whether or not the entity for which they work is in the formal or informal sector. Persons in informal employment, therefore, comprise all persons in the informal sector, employees in the formal sector, and persons working in private households who do not get basic benefits such as pension or medical aid contributions from their employer, and who do not have a written contract of employment (BVLM Municipal Capacity Assessment 2018; WLM Municipal Capacity Assessment 2019).

The Farmworker Household Survey Report of 2014/15 reports on general demographic trends of farmworker households within the Cape Winelands. According to the study, BVLM had 1005 households and approximately 4222 people living and working on farms, while WLM had the highest

number of households at 2482, and 8181 number of people. The study found that an overall of 62.6% of individuals living in farmworker households had permanent jobs both on and off the farm on which they reside. Approximately 18% of individuals living on farms were unemployed, while 19% had either temporary or seasonal work. It is important to note that these statistics presented are based on a survey conducted by the Western Cape Department of Agriculture during the 2014/15 financial period. It is therefore likely that figures have changed over the past six years (Western Cape Government Farmworker Household Survey Report 2014/15; BVLM IDP Review 2020-2021).
In terms of the local context, brief participant observation and a limited number of interviews were conducted to supplement secondary data. Key socio-economic issues listed by respondents confirm themes identified by the secondary data and include:

- Lack of economic development and job opportunities – especially for youth;
- Lack of recreational opportunities for youth;
- Increasing level of school dropout, lack of access to post school training, and other future enhancing opportunities among the youth resulting in despondency, apathy and growing rate of social ills;
- Increasing rate of teenage pregnancies;
- Poverty;
- Food insecurity;
- Rising levels of crime, drug abuse and gangsterism;
- Lack of municipal services, such as road maintenance, transport, and policing; and
- Marginalization from renewable energy developments.

B.16 Eco-Tourism Activities

The potential impacts on eco-tourism activities have been addressed in the Visual Impact Assessment (Appendix C.2 of this Final BA Report), and the Socio-Economic Assessment (Appendix C.7 of this Final BA Report). Further to the game reserves, game farms, nature reserves and National Parks noted above, further high level research has been undertaken to document some of the key eco-tourism activities in the area.

The Klondyke Cherry Farm[6] is located approximately 30 km from the town of Ceres in the Koue Bokkeveld. It offers accommodation, camping and cherry picking, and is located more than 40 km from the proposed project sites, towards the south-west. The Tankwa Padstal is on the R355 about 70 km north-east of Ceres, and is a well-known feature of the Ceres Karoo. The padstal is located more than 40 km from the proposed project sites, towards the north-west. The Zwartkop Guest Farm is located more than 20 km from the project sites, and the Matroosberg Nature Reserve, Gatsrivier Guest Farm, Kapklip Private Nature Reserve and Aquila Private Game Reserve are all located more than 50 km away from the proposed project sites.

The above activities will not be impacted by the proposed projects due to their respective distances from the proposed project sites. General traffic related impacts, although of low to very low significance, are addressed in Section D and Appendix J of this Final BA Report.

[6] https://www.cherryfarm.co.za/; Accessed February 2021.

B.17 Civil Aviation

As required by GN 320, a Civil Aviation Site Sensitivity Verification has been compiled and included in Appendix C.9 of this BA Report. Overall, the proposed project areas fall within a low sensitivity area from a Civil Aviation perspective.

B.18 Bats

The DEFF Screening Tool shows that the site is low sensitivity for bats in relation to Solar PV, and no information is provided in relation to EGI. In addition, a Bat Impact Assessment study is not triggered by the Screening Tool for solar PV or EGI developments. The Wind and Solar SEA Phase 1 and Phase 2, explain that "to date, Solar PV developments have not been found to present a significant direct impact on bat populations" (DEFF, 2019, Part 3.2, Page 2). The EGI Expansion SEA states the following in terms of bats and power lines (DEFF, 2019, Part 4.2.1, Page 14):

- *No record of bat fatalities due to power line electrocution or collision with infrastructure exists to date in South Africa.*
- *There is limited evidence to suggest that electromagnetic radiation emitted by the power lines will affect flying bats or interfere with the echolocation of insectivorous bats during foraging.*

In terms of the potential impact of habitat disturbance of bat communities through land clearance, the EMPr contains various management actions that relate to the clearance of vegetation, and to limit the disturbance of construction activities on the surrounding environment and species. For example, the Generic EMPr for Power Lines notes that vegetation clearing must be restricted to the authorised development footprint of the proposed infrastructure.

SECTION C: PUBLIC PARTICIPATION

C.1 Introduction to the Public Participation Process

This section provides an overview of the tasks undertaken during the BA, with a particular emphasis on providing a clear record of the Public Participation Process (PPP) that was followed. An integrated PPP has been undertaken for the BA Processes (i.e. Witte Wall PV1; Witte Wall PV2; Grootfontein PV 1; Grootfontein PV 2; Grootfontein PV 3; Hoek Doornen PV 1; Hoek Doornen PV 2; Hoek Doornen PV 3; and Hoek Doornen PV 4). The integrated PPP for the proposed projects ensured that all public participation documents (such as newspaper advertisements, site notices, notification letters, emails etc.) served to notify Interested and Affected Parties (I&APs), Stakeholders and Organs of State of the joint availability of reports for the abovementioned projects and provided I&APs with an opportunity to comment on the reports. This approach was undertaken due to the close proximity of the sites (i.e. the proposed projects will take place within the same geographical area) and that proposed projects entail the same activity (i.e. generation of energy using a renewable source (i.e. Solar PV), and distribution of electricity via power lines).

The PPP for these BA Processes is driven by a stakeholder engagement process that includes inputs from authorities, I&APs, technical specialists and the project proponent. Guideline 4 on "Public Participation in support of the EIA Regulations" published by the former Department of Environmental Affairs and Tourism (DEAT) in May 2006, states that public participation is one of the most important aspects of the EA Process. This stems from the requirement that people have a right to be informed about potential decisions that may affect them and that they must be afforded an opportunity to influence those decisions. Effective public participation also improves the ability of the Competent Authority (CA) to make informed decisions and results in improved decision-making as the view of all parties are considered.

An effective PPP could therefore result in stakeholders working together to produce better decisions than if they had worked independently. The DEAT guideline states the following in terms of PPP:

- "*Provides an opportunity for I&APs, EAPs and the CA to obtain clear, accurate and understandable information about the environmental impacts of the proposed activity or implications of a decision;*
  - *Provides I&APs with an opportunity to voice their support, concern and question regarding the project, application or decision;*
  - *Enables an applicant to incorporate the needs, preferences and values of affected parties into its application;*
  - *Provides opportunities for clearing up misunderstanding about technical issues, resolving disputes and reconciling conflicting interests;*
  - *Is an important aspect of securing transparency and accountability in decision-making; and*
  - *Contributes toward maintaining a health, vibrant democracy*."

To the above, one can add the following universally recognised principles for public participation:

- Inclusive consultation that enables all sectors of society to participate in the consultation and assessment processes;

- Provision of accurate and easily accessible information in a language that is clear and sufficiently non-technical for I&APs to understand, and that is sufficient to enable meaningful participation;
- Active empowerment of grassroots people to understand concepts and information with a view to active and meaningful participation;
- Use of a variety of methods for information dissemination in order to improve accessibility, for example, by way of discussion documents, meetings, workshops, focus group discussions, and the printed and broadcast media;
- Affording I&APs sufficient time to study material, to exchange information, and to make contributions at various stages during the assessment process;
- Provision of opportunities for I&APs to provide their inputs via a range of methods, for example, via written submissions or direct contact with members of the BA team; and
- Public participation is a process and vehicle to provide sufficient and accessible information to I&APs in an objective manner to assist I&APs to identify issues of concern, to identify alternatives, to suggest opportunities to reduce potentially negative or enhance potentially positive impacts, and to verify that issues and/or inputs have been captured and addressed during the assessment process.

At the outset it is important to highlight two key aspects of public participation:

- There are practical and financial limitations to the involvement of all individuals within a PPP. Hence, public participation aims to generate issues that are representative of societal sectors, not each individual. Hence, the PPP will be designed to be inclusive of a broad range of sectors relevant to the proposed project.
- The PPP will aim to raise a diversity of perspectives and will not be designed to force consensus amongst I&APs. Indeed, diversity of opinion rather than consensus building is likely to enrich ultimate decision-making. Therefore, where possible, the PPP will aim to obtain an indication of trade-offs that all stakeholders (i.e. I&APs, technical specialists, the authorities and the development proponent) are willing to accept with regard to the ecological sustainability, social equity and economic growth associated with the project.

The Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations was also considered during this BA Process.

The key steps in the PPP for the BAs are described below. This approach is structured in line with the requirements of Chapter 6 (PPP) of the 2014 NEMA EIA Regulations (as amended, i.e. GN R326), as well as the approved Public Participation Plan, as described below. Various mechanisms have been undertaken to provide notice to all potential and registered I&APs of the proposed projects, as described below.

The BA Processes commenced in August 2020, whereby the specialist studies were commissioned and the Draft BA Reports were being compiled. The Draft BA Reports were released to I&APs, Stakeholders and Organs of State (including the National DEFF) for a 30-day comment period, extending from 3 December 2020 to 25 January 2021. The Application for EA was be submitted to the National DEFF at the same time as the Draft BA Reports.

C.2 Requirement for a Public Participation Plan

On 5 June 2020, the Minister of Forestry, Fisheries and the Environment issued Directions in terms of regulation 4 (10) of the Regulations issued by the Minister of Cooperative Governance and Traditional Affairs in terms of section 27(2) of the Disaster Management Act, 2002 (Act 57 of 2002). These

Directions were published in Government Gazette 43412, GN 650 on 5 June 2020, regarding measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences.

Regulation 5.1 of GN 650 states that Authorities responsible for the processing of applications contemplated in the EIA Regulations, will be receiving such applications from 5 June 2020 and will receive and process applications and issue decisions in the manner as set out in Annexure 2 of GN 650. Regulation 5.2 of GN 650 states that Annexure 3 includes additional requirements in respect of the provision, supporting or obtaining of services contemplated in Regulation 5.1.

Annexure 3 of GN 650 states that an EAP must:

- Prepare a written public participation plan, containing proposals on how the identification of and consultation with all potential Interested and Affected Parties (I&APs) will be ensured in accordance with Regulation 41(2)(a) to (d) of the 2014 NEMA EIA Regulations (as amended) or proposed alternative reasonable methods as provided for in regulation 41(2)(e), for purposes of an application and submit such plan to the competent authority; and
- Request a meeting or pre-application discussion with the competent authority to determine the reasonable measures to be followed to identify potential I&APs and register IA&Ps for purposes of conducting public participation on the application requiring adherence to Chapter 6 of the 2014 NEMA EIA Regulations (as amended) as set out in the public participation plan and obtain agreement from the competent authority on the public participation plan.

GN 650 also states that for new applications, the public participation plan agreed with the competent authority must be annexed to the application form.

The Public Participation Plan required in terms of GN 650 was submitted to the DEFF via email on 1 September 2020 and then approved by the DEFF on 3 September 2020. Refer to Appendix D.1 of this BA Report for a copy of the Public Participation Plan, Appendix D.2 for proof of submission of Public Participation Plan to the DEFF, and Appendix D.3 for a copy of DEFF's Approval of the Public Participation Plan. The PPP was undertaken in compliance with the Public Participation Plan.

C.3 Pre-Application Meeting and Consultation with the DEFF

A Pre-Application Meeting took place with the Competent Authority, the National Department of Environment, Forestry and Fisheries (DEFF), on 25 August 2020 (Reference Number: 2020-08-0013), in order to discuss and agree on various aspects with the DEFF prior to release of the BA Reports. The following points were discussed with the DEFF:

- An overview of the project description;
- Confirmation on the approach towards including Lithium Ion Battery Energy Storage Systems in the project description;
- Findings of the National Web-Based Screening Tool Reports;
- Discussion and confirmation on the specialist assessments and compliance statements to be undertaken;
- Discussion and confirmation on the approach towards the specialist reporting, including that of the recently published Assessment Protocols (GN 320, dated 20 March 2020);
- Approach to the Public Participation Process, including the Public Participation Plan required as per the Directions issued by the DEFF on 5 June 2020 in GN 650;

- Discussion and confirmation on the proposed project schedule and overall process for the BAs, including the applicable Listed Activities and Cumulative Impact Assessment approach; and
- Points for clarification.

Refer to Appendix I.1 of this BA Report for a copy of the Pre-Application Meeting Request Form submitted to the DEFF; Appendix I.2 for a copy of the presentation delivered at the Pre-Application Meeting; Appendix I.3 for a copy of the Pre-Application Meeting Notes; as well as Appendix I.4 with a copy of correspondence from the DEFF with approval of the Pre-Application Meeting Notes. The Pre-Application Meeting Notes were submitted to the DEFF via email on 2 September 2020 and approved by the DEFF on 16 September 2020.

The Public Participation Plan was therefore discussed with the DEFF during the Pre-Application Meeting in order to facilitate the decision-making on the plan itself.

As noted above, a request for a combination application and multiple EA approach was also discussed with the DEFF in August and September 2020, which was formally submitted to the DEFF on 9 September 2020, and thereafter approved on 6 October 2020 (with the letter dated 2 October 2020). A copy of this approval letter from the DEFF is included in Appendix I.5 of this BA Report.

C.4 Landowner Written Consent

Regulation 39 (1) of the 2014 NEMA EIA Regulations (as amended) states that "*if the proponent is not the owner or person in control of the land on which the activity is to be undertaken, the proponent must, before applying for an environmental authorisation in respect of such activity, obtain the written consent of the landowner or person in control of the land to undertake such activity on that land*".

Regulation 39 (2) of the 2014 NEMA EIA Regulations (as amended) further states that "*sub-regulation (1) does not apply in respect of: (a) linear activities; (b) activities constituting, or activities directly related to prospecting or exploration of a mineral and petroleum resource or extraction and primary processing of a mineral or petroleum resource; and (c) strategic integrated projects as contemplated in the Infrastructure Development Act, 2014*".

Written consent has been obtained from the landowners on which the non-linear infrastructure is proposed to be located. The written consent has been included as an appendix to the Application for EA, which was submitted to the DEFF, together with the Draft BA Reports for comment. As noted in Section A of this Final BA Report, an amended Application for EA will be submitted to the DEFF with the Final BA Reports based on certain listed activities no longer being applicable.

C.5 Site Notice Boards

One specific mechanism of informing I&APs of the proposed projects includes the placement of site notice boards. Regulation 41 (2) (a) of the 2014 NEMA EIA Regulations (as amended) requires that a notice board providing information on the project and BA Process is fixed at a place that is conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of the site where the application will be undertaken or any alternative site.

Notice boards were placed at the entrance of the key affected farm portions on which the proposed projects will be constructed, as well as at strategic locations, government facilities, and well-known

retail facilities in Ceres and Touws River. The site notice boards were placed on 15 and 16 October 2020. Table C.1 provides a breakdown of the locations at which the site notice boards were placed.

Table C.1. Site Notice Board Placement for the Proposed Projects

Number	Locality / Description	Co-ordinates
1	Site Notice board placed at the entrance gate to Witte Wall farm on R356	S32°58'26.6" and E19°54'28.6"
2	Site Notice board placed at the entrance gate to Grootfontein farm on R356	S32°55'58.6" and E19°56'02.8"
3	Site Notice board placed at the entrance gate to the Eskom Kappa Substation	S33°06'19.9" and E20°00'15.7"
4	Site Notice board placed at the Super Spar in Ceres	S33°22'20.08" and E19°18'21.05"
5	Site Notice board placed at the Witzenberg Local Municipality in Ceres	S33°22'15.91" and E19°18'26.86"
6	Site Notice board placed at the AgriMark Cooperation in Ceres	S33°21'36.06" and E19°18'49.74"
7	Site Notice board placed at the Medical Clinic in Touws River	S33°20'26.39" and E20°01'43.51"
8	Site Notice board placed at the Breede Valley Local Municipality in Touws River	S33°20'25.69" and E20°01'51.83"
9	Site Notice board placed at the Super Spar in Touws River	S33°20'24.69" and E20°01'52.77"
10	Site Notice board placed at the Public Library in Touws River	S33°20'24.62" and E20°01'53.89"

Site notice boards were placed in English and Afrikaans; and included the following, in compliance with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended):

- The details of the proposed projects that are subjected to public participation;
- Explanation that a BA procedure is applicable to the proposed projects;
- The nature and location of the proposed projects;
- Details on where further information on the BA projects can be obtained; and
- The manner in which and the person to whom representations in respect of the BA Projects can be made.

Refer to Appendix D.4 of this BA Report for copies and proof of placement of the site notice boards. The site notice boards proved to be successful as various requests for registration as I&APs were received during the pre-application stage when the site notices were placed. In addition, the EAP received various telephonic calls from I&APs that viewed the notice boards, to enquire about the proposed projects, especially from a job creation perspective.

C.6 Newspaper Advertisements

Regulation 41 (2) (c) of the 2014 NEMA EIA Regulations (as amended) requires the placement of a newspaper advertisement in one local newspaper or any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of the NEMA EIA Regulations.

In line with this, in order to notify and inform the public of the proposed projects, to invite I&APs to register on the project database, as well as to inform I&APs of the release of the BA Reports for comment, the BA Processes were advertised in two local newspapers at the commencement of the 30-day comment period for the Draft BA Reports. Specifically, newspaper advertisements were placed in the Worcester Standard in English; and in the Witzenberg Herald in Afrikaans. The content of the newspaper advertisement complies with Regulation 41 (3) of the 2014 NEMA EIA Regulations (as amended). The newspaper advertisements also included the details of the project website, where information available on the proposed project can be downloaded from. Refer to Appendix D.5 of this BA Report for copies the content of and proof of placement of the newspaper advertisements.

At this stage, there are no official Gazettes published specifically for the purpose of providing public notice of applications or other submissions made in terms of the 2014 NEMA EIA Regulations (as amended).

C.7 Determination of Appropriate Measures

Refer to the section below which provides a detailed outline of the measures taken to include all potential I&APs, stakeholders and Organs of State in the BA Process.

In terms of Regulation 41 (2) (e) of GN R326, no persons have been identified as desiring but unable to participate in the process. No comments or telephonic calls were received from I&APs or stakeholders during the 30-day review period noting that they were desiring but unable to participate in the process. Comments were received on the Public Participation Process from four members of the Ceres-Tankwa Karoo Farmers Association, as well as the owner of the nearby Sadawa Game Farm (who is also the Chairperson of the Ceres-Tankwa Karoo Farmers Association). These comments have been adequately responded to in the Comments and Responses Report included in Appendix D of this Final BA Report.

Therefore, no alternative methods have been agreed to by the competent authority. It was proposed that if during the BA Processes, persons are identified as desiring but unable to participate due to illiteracy, disability or any other disadvantage, then the EAP will contact the I&AP to discuss the proposed projects and provide assistance, where needed.

In line with Regulation 41 (2) (b) of GN R326 and prior to the commencement of the BA Processes (and advertising the EA Processes in the local print media), an initial database of I&APs (including key stakeholders and Organs of State) was developed for the BA Processes. This was undertaken based on research. Appendix D.6 of this BA Report includes a copy of the I&AP Database, which indicates interaction with I&APs, key stakeholders and all I&APs that have been added to the project database.

In line with Regulation 41 (2) (b) of GN R326, the database includes the details of the following:

- Landowners of the affected farm portions;
- Occupiers of the affected farm portions;
- Landowners of the neighbouring adjacent farm portions;
- The municipal councillor of the ward in which the proposed projects will be undertaken (Ward 12 of the Witzenberg Local Municipality);
- The municipality which has jurisdiction in the area (i.e. Witzenberg Local Municipality and the Cape Winelands District Municipality);
- Relevant Organs of State that have jurisdiction in respect of any aspect of the activity; and
- Any other party as required by the competent authority.

The I&AP database contains, as a minimum, the competent authority (DEFF); relevant state departments (e.g. Western Cape Department of Environmental Affairs and Development Planning (DEADP), Department of Human Settlements and Water and Sanitation (DHSWS), Department of Mineral Resources and Energy (DMRE) etc.); relevant organs of state (e.g. Witzenberg Local Municipality, Cape Winelands District Municipality, Eskom SOC Ltd etc.); as well as potential and registered I&APs (e.g. landowners, neighbours etc.).

The above stakeholders, Organs of State and I&APs have accordingly received written notification of the commencement of the BA Processes and release of the Draft BA Reports for comment.

While I&APs have been encouraged to register their interest in the project from the start of the process, following the public announcements, the identification and registration of I&APs are ongoing for the duration of the study. Stakeholders from a variety of sectors, geographical locations and/or interest groups are expected to show an interest in the proposed project, for example:

- Provincial and Local Government Departments;
- Local interest groups, for example, Councillors and Rate Payers associations;
- Surrounding landowners;
- Farmer Organisations;
- Environmental Groups and NGOs; and
- Grassroots communities and structures.

As per Regulation 42 of the GN 326, in terms of the electronic database, I&AP details will be captured and automatically updated as and when information is distributed to or received from I&APs. This ongoing record of communication is an important component of the PPP. It must be noted that while not required by the regulations, those I&APs proactively identified at the outset of the BA Process will remain on the project database throughout the process and will be kept informed of all opportunities to comment and will only be removed from the database by request.

C.8 Approach to the PPP

In terms of Regulation 41 (6) of GN R326 the section below outlines the PPP for this assessment in order to provide potential I&APs, Stakeholders and Organs of State access to information on the project and the opportunity to comment at the various stages of the assessment process.

C.8.1 BA Report Phase - Review of the Draft BA Report

As noted above, the Draft BA Reports for the proposed projects were released to I&APs, Stakeholders and Organs of State for a 30-day comment period. The section below summarises the PPP undertaken for the review of the BA Reports.

- **Database Development and Maintenance**: In line with Regulation 41 (2) (b) of GN R326, an initial database of potential I&APs was developed for the BA Process, and has been updated throughout the process.
- **Site Notice Board**: As noted in Section C (5) above, notice boards were placed for the proposed projects. A copy of the notice boards is included in Appendix D.4 of this BA Report.
- **Advertisements to Register Interest:** An advertisement was placed in the Worcester Standard in English; and in the Witzenberg Herald in Afrikaans at the commencement of the 30-day review

period for the Draft BA Reports. A copy of the content of and proof of placement of the advertisements is included in Appendix D.5 of this Final BA Report.

- **Submission of the Application Form and Draft BA Reports to the DEFF**: The Application Form for EA and Draft BA Reports were submitted to the DEFF via the DEFF Novell Filr System and proof of upload was emailed to the DEFF on 3 December 2020. Proof of submission of the Draft BA Reports to the DEFF and proof of upload to the DEFF Novell Filr System is included in Appendix D.13 of this BA Report.
- **Letter 1 to I&APs (Commencement of the BA Process)**: Written notification of the availability of the BA Reports (i.e. Letter 1) was sent to all I&APs and Organs of State (including landowners and adjacent landowners) included on the project database (at the time of releasing the Draft BA Reports for comment) via email, where email addresses were available. This letter was sent at the commencement of the 30-day review period on the BA Reports, and included information on the projects and notification of the release and availability of the reports. Letter 1 was written in English and Afrikaans. Proof of the email, as well as copies of the Letter 1 sent are included in Appendix D.13 of this Final BA Report, which has been submitted to the DEFF for decision-making. A follow up email was also sent to all I&APs on the database on 11 January 2021 to serve as a reminder of the closure of the comment period and to seek as many comments as possible. Proof of the follow up email is included in Appendix D.13 of this Final BA Report, as well as various other follow up emails sent to seek comment.
- **Personalized Letters:** Such letters were sent via email to the DEFF, Witzenberg Local Municipality; Cape Winelands District Municipality; Western Cape DEADP; Endangered Wildlife Trust (EWT), and the Breede-Gouritz Catchment Management Agency (BGCMA) in order to seek comments on the Draft BA Reports. Proof of the personalized letters sent via email are included in Appendix D.13 of this Final BA Report.
- **Text Messaging**: SMS texts were also sent on 4 December 2020 to all I&APs on the database (at the time of releasing the Draft BA Reports for comment), where cell phone numbers were available, to inform them of the proposed project and how to access the Draft BA Reports. Furthermore, a reminder SMS text was also sent on 11 January 2021 to all I&APs on the database (at the time) to request for comment on the Draft BA Reports and to remind I&APs of the comment period closure. Proof of text messaging is included in Appendix D.13 of this BA Report.
- **Broader Associations**: The Chairperson of the Ceres-Tankwa Karoo Farmers Association also circulated comments on the Draft BA Reports to the various members of the association, which served to spread awareness of the proposed projects.
- **Executive Summaries of the BA Reports**: Executive Summaries of the BA Reports were also emailed to I&APs on the database together with Letter 1, and uploaded to the project website and Google Drive.
- **30-day Comment Period**: As noted above, potential I&APs, including authorities and Organs of State, were notified via Letter 1, of the 30-day comment and registration period within which to submit comments on the BA Reports and/or to register on the I&AP database. The comment period extended from 3 December 2020 to 25 January 2021 and in line with the 2014 NEMA EIA Regulations (as amended), the period of 15 December 2020 to 5 January 2021 was excluded from the reckoning of days.
- **Availability of Information:** The Draft BA Reports were made available for a 30-day comment period, and were distributed to ensure access to information on the project and to communicate the outcome of specialist studies. The Draft BA Reports were uploaded to the project website (i.e. https://www.csir.co.za/environmental-impact-assessment) for I&APs to access it. As a supplementary mechanism, the Draft BA Reports were also uploaded to an alternative web-

platform (i.e. Google Drive[7]). Proof of upload of the Draft BA Reports to the project website and Google Drive is included in Appendix D.13 of this Final BA Report. If an I&AP could not access the report via the project website, via the alternative web-platforms such as Dropbox or Google Drive, and if additional information is required (other than what is provided in the Executive Summaries), then the I&AP could contact the EAP, who would have then make an electronic copy available (where feasibly possible).

- **Focus Group Meeting:** A meeting was held, under adjusted Lockdown Level 3, with the Chairperson of the Ceres-Tankwa Karoo Farmers Association in the town of Ceres on 14 January 2021. This took place as the EAP was contacted in December 2020 by the Chairperson to request a meeting to discuss the proposed projects, request feedback on queries and to raise comments on an individual basis and as the Chairman of the Ceres-Tankwa Karoo Agricultural Association.
- **Comments Received**: A key component of the BA Process is documenting and responding to the comments received from I&APs and the authorities. Copies of all comments received during the review of the Draft BA Reports have been included as Appendix D.14 of the Final BA Reports, and in the Comments and Response Report (Appendix D.15 of the Final BA Report). Refer to Section C.11 of this report for additional information on the comments received.

C.8.2 Compilation of Final BA Reports for Submission to the DEFF

Following the 30-day commenting period of the BA Reports and incorporation of the comments received into the reports, the Final BA Reports were submitted to the DEFF in line with Regulation 19 (1) (a) of the 2014 NEMA EIA Regulations (as amended). The reports have been submitted electronically to the DEFF via the Novell Filer system, as recommended by the DEFF since June 2020.

In line with best practice, I&APs on the project database will be notified via Letter 2 via email (where email addresses are available) of the submission of the Final BA Reports to the DEFF for decision-making. To ensure ongoing access to information, copies of the Final BA Reports that have been submitted for decision-making and the Comments and Response Reports (detailing comments received during the BA Phase and responses thereto) will be placed on the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). As a supplementary mechanism, the Final BA Reports will also be uploaded to other alternative web-platforms such as Dropbox or Google Drive.

The Final BA Reports which have been submitted for decision-making to the DEFF include proof of the PPP that was undertaken to inform Organs of State, Stakeholders and I&APs of the availability of the BA Reports for the 30-day review (as explained above).

The DEFF will have 57 days (from receipt of the Final BA Reports) to either grant or refuse EA (in line with Regulation 20 (1) of the 2014 NEMA EIA Regulations (as amended) and GN 114 of February 2018).

C.8.3 Environmental Decision-Making and Appeal Period

Subsequent to the decision-making phase, if EAs are granted by the DEFF for the proposed projects, all registered I&APs, Organs of State and stakeholders on the project database will receive notification of the issuing of the EAs and the associated appeal period. The 2014 NEMA EIA

[7] Google Drive Link: https://drive.google.com/drive/folders/1V3Ehq6JJUfKzCjq5wH7IF_vbifbQi7Wo?usp=sharing

Regulations (as amended) (i.e. Regulation 4 (1)) states that after the Competent Authority has a reached a decision, it must inform the Applicant of the decision, in writing, within 5 days of such decision. Regulation 4 (2) of the 2014 NEMA EIA Regulations (as amended) stipulates that I&APs need to be informed of the EA and associated appeal period within 14 days of the date of the decision. All registered I&APs will be informed of the outcome of the EAs and the appeal procedure, as well as the respective timelines.

The distribution of the EAs (should such authorisations be granted by the DEFF), as well as the notification of the appeal period, will include a letter (i.e. Letter 3 (Release of Environmental Authorisation and Notification of Opportunity to Appeal)) to be sent via email to all registered I&APs, Stakeholders and Organs of State on the database, where email addresses are available. The letter will include information on the appeal period, as well as details regarding where to obtain a copy of the EAs. A copy of the EAs will be emailed with Letter 3. The EAs will also be uploaded to the project website (i.e. https://www.csir.co.za/environmental-impact-assessment). SMS texts will also be sent to all I&APs on the database, where cell phone numbers are available, to inform them of the EAs (should they be granted).

C.9 Consultation with Heritage Western Cape

In line with Heritage Western Cape (HWC) requirements, three Notifications of Intent to Develop (NIDs) were submitted for the proposed projects to the HWC on 21 August 2020 by Dr. Jayson Orton of ASHA Consulting (PTY) Ltd. HWC responded on 14 September 2020 confirming that a Heritage Impact Assessment that satisfies the provisions of Section 38(3) of the NHRA be submitted; and it must have specific reference to a Visual Impact Assessment; an Archaeological Impact Assessment; and a Palaeontological Impact Assessment. The following reference numbers were assigned to the HWC applications:

- Witte Wall PV Facilities, EGI and associated infrastructure: Case 20081910SB0825E;
- Grootfontein PV Facilities, EGI and associated infrastructure: Case 20081908SB0821E; and
- Hoek Doornen PV Facilities, EGI and associated infrastructure: Case 20081909SB0825E.

Refer to Appendix D.8 of this BA Report for proof of submission of the NID to HWC; as well as Appendix D.9 for the acknowledgement of receipt of the NID from HWC.

In line with the above, a Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) and Visual Impact Assessment (Appendix C.3 and Appendix C.2 of this BA Report, respectively), were commissioned, as described in Section A of this report.

As per HWC requirements, the Heritage Impact Assessment and Visual Impact Assessment were sent to the Witzenberg Local Municipality. There are no heritage conservation bodies within the jurisdiction of the proposed projects, however the reports were sent to the closest bodies i.e. the Hex River Valley Heritage and Conservation Society; and the Touws River Heritage and Conservation Society. The reports were sent via email on 16 October 2020 for a 30-day comment period. The Hex River Valley Heritage and Conservation Society provided comment on the above reports, noting that they were in support of the proposed projects and the findings of the studies. Refer to Appendix D.10 of this BA Report for proof of consultation with the Witzenberg Local Municipality and Heritage Conservation Bodies. The Heritage Impact Assessment (Archaeology, Cultural Landscape and Palaeontology) and Visual Impact Assessment were then sent to the HWC for consideration on 17 November 2020. Refer to Appendix D.11 of this Final BA Report for proof of submission of the Heritage Impact Assessment to HWC for decision-making, as well as their acknowledgement of

receipt. HWC provided approval of the Heritage Impact Assessment on 15 December 2020, after the report was discussed at the HWC Impact Assessment Committee (IACOM) meeting held on 9 December 2020. Refer to Appendix D.12 of this Final BA Report for a copy of the approval from HWC.

C.10 Summary of Post-Application Consultation with the DEFF

As noted above, the Application Form for EA and Draft BA Reports were submitted to the DEFF via the DEFF Novell Filr System on 3 December 2020. Refer to Appendix D.13 of this BA Report for copies of such correspondence. The DEFF acknowledged receipt and provided the following reference numbers (as indicated in Appendix D.14 of this Final BA Report):

Table C.2. DEFF Reference Numbers

Report	Project	Reference Number
Witte Wall Report 1	Witte Wall PV 1	14/12/16/3/3/1/2273
	Witte Wall PV 2	14/12/16/3/3/1/2274
Grootfontein Report 2	Grootfontein PV 1	14/12/16/3/3/1/2275
	Grootfontein PV 2	14/12/16/3/3/1/2276
	Grootfontein PV 3	14/12/16/3/3/1/2277
Hoek Doornen Report 3	Hoek Doornen PV 1	14/12/16/3/3/1/2278
	Hoek Doornen PV 2	14/12/16/3/3/1/2279
	Hoek Doornen PV 3	14/12/16/3/3/1/2280
	Hoek Doornen PV 4	14/12/16/3/3/1/2281
EGI Report 4 (i.e. this report)	Witte Wall PV 1 EGI	14/12/16/3/3/1/2282
	Witte Wall PV 2 EGI	14/12/16/3/3/1/2283
	Grootfontein PV 1 EGI	14/12/16/3/3/1/2284
	Grootfontein PV 2 EGI	14/12/16/3/3/1/2285
	Grootfontein PV 3 EGI	14/12/16/3/3/1/2286
	Hoek Doornen PV 1 EGI	14/12/16/3/3/1/2287
	Hoek Doornen PV 2 EGI	14/12/16/3/3/1/2288
	Hoek Doornen PV 3 EGI	14/12/16/3/3/1/2289
	Hoek Doornen PV 4 EGI	14/12/16/3/3/1/2290

C.11 Issues Raised by Stakeholders and Comments and Responses Report

Issues raised by I&APs during the release of the Draft BA Reports for comment have been captured in Appendix D.14 of this Final BA Report, and responses to the comments have been provided by the project team in the Comments and Responses Report included in Appendix D.15 of this Final BA Report.

A summary of the key issues raised and responses are captured below in Table C.3. Note that comments related to Visual and Heritage (specifically regarding the Old Forgotten Highway) aspects are only applicable to the Hoek Doornen PV Project. Refer to the Final BA Report for the Hoek Doornen PV Project (i.e. Report 3) for additional information.

Table C.3. Summary of Key Issues Raised during the 30-Day Review Period

Key Issue	Response
Requests to register on the I&AP database, general comments, requests for the link to download the reports, comments on the need for the proposed projects, and comment on the impact assessment methodology	These comments relate to the requests to register interest, submission of comments, and acknowledgement of receipts. These have all been included in Appendix D.14 and D.15 of this Final BA Report. The impact assessment methodology has been adequately captured in Section D of this Final BA Report, as well as each specialist assessment in Appendix C. The impact assessment is based on various factors and assumptions, including specialist expertise, as detailed in the specialist assessments. With regard to the comments on the positive and negative impacts of the proposed project, the benefits of the proposed project, as well as the need and desirability, along with all positive and negative impacts predicted for the proposed project are captured in the BA Report. The relevant management actions are also included in the EMPr. If the proposed projects receive Environmental Authorisation, and the EMPr is accepted, it becomes legally binding on the Applicant. Furthermore, an Environmental Control Officer will be appointed to ensure compliance of the construction activities with the Environmental Authorisation (should it be granted) and EMPr.
Clarification and confirmation of the applicable listed activities	Section A.11 of the Final BA Report has been updated to include feedback on some of the listed activities that are no longer applicable to the project. The WC DEADP explains in their comment on the Draft BA Report that a bioregional plan has not been adopted by the competent authority for the Western Cape geographical area, and as such as relevant listed activities in Listing Notice 3 are not applicable. As described in Section A.11 of this Final BA Report, the relevant listed activities that are no longer applicable, based on feedback from the WC DEADP, have been removed from the Application Form for EA. However, even though the bioregional plan has not been formally adopted by the Competent Authority, this BA Process has still assessed the impact of the proposed projects on Critical Biodiversity Areas and Ecological Support Areas in terms of the WCBSP (2017).
Request for various feature, sensitivity maps and layout maps by the DEFF	The relevant feature, layout and sensitivity maps requested by the DEFF have been included in Section D of this BA Report, as well as Appendix A, as applicable. Where certain maps could not be combined due to scale, separate maps were then provided.
Feedback on the manner in which the Cumulative Impact Assessment has been undertaken and linking it to the need and desirability of the proposed project and provision of an overall cumulative impact	The approach for the cumulative impact assessment included all renewable energy and EGI projects within a 30 km radius that received an EA at the time of starting this BA (i.e. by August 2020), as well as the

Key Issue	Response
environmental statement	nine proposed Veroniva PV Developments and nine proposed Veroniva EGI Developments. The specialists have identified cumulative impacts as per the above approach, and such impacts have been clearly defined, and where possible the size of the identified impact was quantified and indicated, i.e. hectares of cumulatively transformed land. Refer specifically to the Appendix C.1 (Agriculture Compliance Statement), Appendix C.4 (Terrestrial Biodiversity and Species), Appendix C.5 (Aquatic Biodiversity and Species) and Appendix C.6 (Avifauna Assessment) for additional information in this regard. With regards to the levels of transformation, the current state of the affected area must also be taken into consideration. A cumulative impact environmental statement was provided in the Draft BA Report, and retained in this Final BA Report (Section E of this Final BA Report). Cumulative impacts were originally considered in the Need and Desirability of the proposed project. Overall, the cumulative impacts are acceptable with the implementation of mitigation measures. The Need and Desirability section of the Final BA Report has been supplemented with additional information.
Public Participation requirements and opinions on the manner in which the process has been undertaken	As indicated above, the Public Participation Process undertaken has complied with the 2014 NEMA EIA Regulations (as amended), as well as the Public Participation Plan that was approved by the DEFF. The Public Participation Plan was required in terms of the directives issued in GN 650 specifying measures to address, prevent and combat the spread of COVID-19 relating to national environmental management permits and licences. In the Public Participation Plan, it was stated that no physical meetings would be undertaken as part of the 30-day comment period, and that the EAP would be able to call any I&AP that may need to raise concerns, require further information or request clarity. Various mechanisms, as described above, have been adopted to ensure that the BA Process notification is widespread. This included sending out emails and text messages, and placement of site notice boards and newspaper advertisements. In addition, a meeting was held, under adjusted Lockdown Level 3, with the Chairperson of the Ceres-Tankwa Karoo Farmers Association in the town of Ceres on 14 January 2021. A detailed copy of the I&AP database is included in Appendix D of this Final BA Report. The database includes the names, contact details and addresses of the I&APs, as well as an indication of the interaction

Key Issue	Response
	with I&APs, as well as all I&APs that have been added to the project database based on requests, submission of comments or based on research. This complies with Regulation 42 of the 2014 NEMA EIA Regulations (as amended). Copies of all comments received during the 30-day comment period of the Draft BA Report have been captured in Appendix D.14 of this Final BA Report. A detailed Comments and Responses Report is included as Appendix D.15 of this Final BA Report. Proof of correspondence with various stakeholders is included in Appendix D.13 of this Final BA Report.
Need for a Generic EMPr for Substations and EMPr for the PV Facility	The Draft BA Report did include two Environmental Management Programmes, as follows: • Appendix G: Environmental Management Programme (EMPr) for the Power Lines to support the proposed PV projects; and • Appendix G.2: Environmental Management Programme (EMPr) for the On-Site Substations to support the proposed PV projects. These EMPRs comply with the Generic EMPr published for substation and power line development (Government Gazette 42323, GN 435, dated 22 March 2019).
Requirement for the validity period and auditing frequency	Such information has been provided in Section E of this Final BA Report.
Agriculture: • The effect of road conditions, poor road maintenance on the production(s) and transport of goods produced in the area. • The potential increase in crime and its effect on the agricultural community. • The development can have a negative effect on the following activities a) hunting in general on all neighbouring farms; management of problem animals; and movement of migrating, indigenous animals.	• Deterioration (or improvement) of road conditions will indeed have an agricultural impact. The rating of the impact would be determined by the prediction of the extent to which roads will deteriorate, based on the traffic assessment, and then the extent to which that is likely to influence farm profitability. The Traffic Impact Statement recognises that heavy traffic contributes to the deterioration of the road surfaces and proposes regular maintenance of access roads by the contractor and ensuring that access roads are restored to original pre-construction road condition as mitigation. With mitigation the significance of this impact is rated as very low. The knock-on effect impact on farm profitability will therefore also be very low. • Various management actions to improve safety are included in the EMPr. • The issue of stray bullets is the responsibility of the hunter and game farm owner, and not the responsibility of the Developer. Nonetheless, health and safety recommendations have been included in the EMPr in relation to open channels of communication needed between relevant parties with regards to hunting on adjacent properties.

Key Issue	Response
Heritage: • Feedback from SAHRA regarding the commenting body for heritage matters in the Western Cape. • Approval from HWC documenting agreement of the management actions provided in the Heritage Impact Assessment.	• As noted above, the Heritage Impact Assessment was submitted to and approved by HWC on 15 December 2020. SAHRA was included on the database for completeness. • The recommendations provided in the Heritage Impact Assessment (Appendix C.3 of the BA Report) have been captured in the EMPr accordingly.
Aquatic Ecology and Biodiversity: • Feedback on sensitive features and buffers, and the identification thereof. • Impact on watercourses.	The specialists have approached determination of flood extent by use of the following features: • Identification of the riparian edge. • Identification of alluvial deposits beyond the riparian edge. • Review and determination of flood extent using the most proximal post Laingsburg flood (1981), aerial imagery (1982) and compared the above findings with this information. • Identified the nearest eco-morphological change in habitat from the extreme flood event and denoted this as the optimal placement of buffer. In most instances, buffer distance to accommodate flood regimes extended beyond 100 m. In addition, with the addition of habitat features such as riverine wash, these buffers were extended even further.
Terrestrial Ecology and Biodiversity: • Query on whether ecological corridors have been allowed for between each of the nine PV facilities. • Focus needed on plant communities. • Extent the vegetation will be shaded by the solar panels. • Recommendations to reduce collisions of vehicles with fauna and other management actions relating to terrestrial ecology, including the potential impact of Riverine Rabbit, as well as the need for a monitoring programme should such species be found on site.	• The broader riverine and wash areas serve, as of present, as the dominant refugia for flora and fauna. These areas have been set outside of the PV facilities. • The field assessment carried out had been inclusive of all ecological factors within the study site. • It is impossible to predict such outcomes in terms of shading. However, other PV projects give rise to increased graminoid cover. The same outcome for these particular projects can be assumed. Continued alteration of habitat structure and composition on account of continuing low level anthropogenic impacts, such as “shading of vegetation” from arrays, has been addressed in the BA. • The EMPr for the proposed projects has been updated to include the various management actions.
Avifauna: • Support for the installation of bird flight diverters. • Recommendation for post-construction monitoring of the power lines to monitor for collision fatalities and reporting requirements. • Query on whether there are any breeding grounds for rare, large bird species such as eagles, vultures or blue cranes along the proposed power	• Clear recommendations for the installation of Bird Flight Diverters are noted in the Avifauna Assessment (Appendix C.6 of the Final BA Report). • The Avifauna Assessment explains that an Avifaunal Specialist must be commissioned to undertake inspections of the power lines during the operational phase on a regular basis to inspect for carcasses. Requirements for reporting to

Key Issue	Response
line route. • Recommendation for a dynamic 5 km buffer area around Martial eagle nests and a 3 km buffer around Verreaux's eagle nest sites in order to reduce fatalities.	relevant authorities have been included in the EMPr. • There are no breeding areas for vultures and Blue Cranes in the power line corridor. The large eagle nests were identified during the pre-construction monitoring, as discussed in the Avifauna Assessment. The closest eagle nest is a Martial Eagle nest which is located approximately 3.7 km from the corridor (on an existing transmission tower) at its closest point. It is not expected that the proposed power line will impact on the eagle nest. It should be noted that the nest was not active in 2019 and 2020. • There are no active Verreaux's Eagle nests which could be influenced by the proposed development. The closest potential breeding habitat is approximately 4 km away to the east. Refer to the comment above about the Martial Eagle nest. The avifauna specialists are of the opinion that construction activities in the corridor will not affect the birds, should the nest be active.
Queries on certain project specifications (i.e. maintenance procedures for infrastructure close to water courses, need for borrow pits, access roads required, confirmation on whether staff housing on site is required, and farm portion clarifications).	These have been responded to in the Comments and Responses Report in Appendix D.15 of this Final BA Report, and additional information has been added to Section A of this report, where required.
Traffic: • Poor condition of the R356. • Need for maintenance and upgrade of the surrounding roads. • Clarification on the vehicle trip definition. • Distinction between external public and internal private access roads in terms of maintenance. • Provision of various management actions (e.g. survey will local ecotourism businesses to plan around tourist traffic). • Recommendations for from the Western Cape Government: Transport and Public Works - Roads Department for a geotechnical and geometric design report, including improvement proposals, must be compiled to ensure that all the roads (on the entire road network) that will be affected by this development are adequately improved and maintained.	• With regards to the condition of the road, the information presented in the Traffic Impact Statement report was taken from the Western Cape Government (WCG) Road Network Information System (RNIS) database (dated 2020) and just serves as background information. • The WCG Transport and Public Works - Roads Department is the controlling authority along these roads and their comments will address any evaluations / improvements that need to be undertaken. The Traffic Impact Statement and EMPr have been updated to contain relevant requirements from the WCG Transport and Public Works - Roads Department. • The trip generation information in the Traffic Impact Statement has been updated to distinguish between and clarify the daily trips to and from the site. The trips listed in the report now relate to the total daily two-way traffic (in and out of the site) and remain more or less unchanged from the numbers originally presented in the Draft BA Report. • The Traffic Impact Statement has been updated to reflect which road is considered as the external public gravel access road (i.e. R356) and internal private gravel access road (i.e. farm roads leading off the R356 to the sites). A drawing distinguishing between these roads has been included in the

Key Issue	Response
	reports, and the text relating to maintenance updated accordingly.
Socio-Economic • A lack of direct communication with local residents and a reliance on secondary data. • Queries on the scale used in determining the significance of job losses. • Limitations of municipal data. • Comments on the EDP specifically benefiting local communities in the Ceres Karoo and the developer's participation in and contribution to crime management in the area during construction phase.	• Interviews were conducted with representatives of local and regional stakeholders, and inputs were received from local stakeholders via email. These concerns were not found to constitute fatal flaws and furthermore the methodology employed by the specialist is in keeping with other Socio-Economic Assessments undertaken for similar BA and EIA projects in the area. • With regards to the comments on the EDP and security management actions, while these concerns were already well addressed in the draft report, the wording of the relevant mitigation and management measures were amended to clarify these points.
Various recommendations were provided on the management of waste and risks of pollution of sensitive environmental features.	The comments received have been noted and where applicable, recommendations have been included in the EMPr to ensure proper waste and pollution management.

SECTION D: IMPACT ASSESSMENT

This section includes a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the construction phase, operational phase, and decommissioning phase, in line with the requirements of the 2014 NEMA EIA Regulations (as amended).

D.1 Approach to the BA: Methodology of the Impact Assessment

The identification of potential impacts includes impacts that may occur during the construction, operational and decommissioning phases of the proposed development. The assessment of impacts includes direct, indirect as well as cumulative impacts. In order to identify potential impacts (both positive and negative) it is important that the nature of the proposed projects is well understood so that the impacts associated with the projects can be assessed. The process of identification and assessment of impacts includes:

- Determining the current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- Determining future changes to the environment that will occur if the activity does not proceed;
- Develop an understanding of the activity in sufficient detail to understand its consequences; and
- The identification of significant impacts which are likely to occur if the activity is undertaken.

The impact assessment methodology has been aligned with the requirements for BA Reports as stipulated in Appendix 1 (3) (1) (j) of the 2014 NEMA EIA Regulations (as amended), which states the following:

“A BA Report must contain the information that is necessary for the Competent Authority to consider and come to a decision on the application, and must include an assessment of each identified potentially significant impact and risk, including –

(i) cumulative impacts;
(ii) the nature, significance and consequences of the impact and risk;
(iii) the extent and duration of the impact and risk;
(iv) the probability of the impact and risk occurring;
(v) the degree to which the impact and risk can be reversed;
(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and
(vii) the degree to which the impact and risk can be mitigated”.

As per the then Department of Environmental Affairs and Tourism (DEAT) Guideline 5: Assessment of Alternatives and Impacts, the following methodology is applied to the prediction and assessment of impacts and risks. Potential impacts and risks have been rated in terms of the direct, indirect and cumulative:

- **Direct impacts** are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

- **Indirect impacts** of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- **Cumulative impacts** are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

The cumulative impacts have been assessed by identifying other renewable energy projects and other applicable (and relevant) projects, such as construction and upgrade of electricity generation, and transmission or distribution infrastructure in the local area (i.e. within 30 km of the proposed solar PV facilities). There are various renewable energy projects being investigated in the local area that are at different stages of planning, ranging from projects that were awarded Preferred Bidder status in terms of the REIPPP, one operational Wind Farm, and projects where the EIAs or BAs are currently being conducted. The Perdekraal East Wind Farm, proposed Hidden Valley Wind Farm, and proposed Roggeveld Wind Farm have all received preferred bidder status. The Perdekraal East Wind Farm became operational in March 2020.

The approach for this BA is that the assessment includes all renewable energy and EGI projects within 30 km that have received an EA at the time of starting this BA (i.e. by August 2020), as well as the nine proposed Veroniva PV Developments and nine proposed Veroniva EGI Developments. The information was collected from the National DEFF Renewable Energy EIA Application (REEA) database, 2020 Quarter 2; as well as from the South African Heritage Resources Information System (SAHRIS), and Eskom's Generation Connection Capacity Assessment (GCCA) (2020). Table D.1, Table D.2 and Table D.3 provides more details; and Figure D.1 provides an illustration of the projects considered in the cumulative impact assessment.

A summary of the process flow followed in the cumulative impact assessment is provided below:

- A list of authorised Renewable Energy and EGI projects within a 30 km radius was identified based on research, SAHRIS, REEA and the Eskom GCCA.
- This resulted in 11 Renewable Energy Projects. Of these, only two are solar PV projects, and one is a hybrid wind and solar PV project. The rest (i.e. majority) are wind energy facilities. Two approved power line projects and other planned and existing power lines based on the Eskom GCCA were also identified.
- In addition to the above, the nine PV projects and nine power line projects as part of this Veroniva development was also considered in conjunction.
- Considering all of the above, the cumulative impacts were then clearly defined, and where possible the size of the identified impact was quantified and indicated, i.e. hectares of cumulatively transformed land. With regards to the levels of transformation, the current state of the affected area was also taken into consideration. In most cases the actual development footprint of the nearby Renewable Energy developments could not be easily quantified or accessed spatially. For example, the REEA database contains land parcels, and not the footprints. Hence the land parcels were considered, which took into account the worst case. This typically allowed the determination of the following aspects (or similar aspects) in the **relevant** specialist assessments:
    - The total affected land parcel area taken up by authorised renewable energy projects and their grid connections within the 30 km radius.
    - The total affected land parcel area of the nine Veroniva Ceres PV projects and grid connections.

  - Combined land parcel area affected by renewable energy developments within the 30 km radius around the Veroniva projects.
  - The total area within the 30 km radius around the proposed projects.
  - The total combined size of the land parcels affected by renewable energy projects and their grid connections as a percentage of the available habitat in the 30 km radius.
- Therefore, the assessment of cumulative impacts was based on the specialist and EAP's knowledge of similar approved Renewable Energy and EGI projects in the 30 km radius. In some cases, the specialists involved in this BA Process were also involved in some of the other Renewable Energy and EGI Projects within the 30 km radius, thus being well aware of the type of impacts and mitigation measures recommended. The specialists assessed such impacts based on their expertise and knowledge of similar projects and management actions. However, the following points are important to note in terms of the cumulative impact assessment:
  - As indicated above, the majority of the projects in the 30 km radius employ wind turbines, which present fundamentally different impacts and externalities that may affect the broader ecology of the region. Furthermore, the majority of the mitigation measures adopted for wind energy facilities do not necessarily apply to Solar PV, such as those relating to avifaunal collisions, noise from turbines, and visual screening.
  - The assessment of cumulative impacts is not necessarily solely focused on an assessment of impacts linked to previously authorised similar developments and consideration of their mitigation measures, but also about the sensitivities of the land on which the projects take place. For example, from a heritage point of view, it is also about other heritage resources, the type of locations they could occur in, and any other developments that may have impacted on heritage resources

Table D.1. Proposed renewable energy and EGI projects that have received EA within 30 km of the proposed projects (Source: DEFF REEA, 2020)

DEFF REFENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
Renewable Energy Projects – Source: DEFF REEA, 2020								
14/12/16/3/3/1/1976	BAR	Proposed development of the 325MW Kudusberg Wind Energy Facility and associated infrastructure in Western and Northern Cape Provinces	Kudusberg Wind Farm (Pty) Ltd	CSIR	Northern Cape Western Cape	Onshore Wind	325	Approved
12/12/20/1783/1	Scoping and EIA (and Amendments)	Proposed development of a Renewable Energy Facility at Perdekraal, Western Cape - Split 1	South Africa Mainstream Renewable Power Perdekraal East Pty Ltd	Environmental Resource Management (Pty) Ltd and Savannah Environmental Consultants (Pty) Ltd	Western Cape	Onshore Wind	150	Approved
12/12/20/1783/2 12/12/20/1783/2/AM1 12/12/20/1783/2/AM3 12/12/20/1783/2/AM4 12/12/20/1783/2/AM5	Scoping and EIA (and Amendments)	Proposed development of a Renewable Energy Facility at Perdekraal, Western Cape - Split 2	South Africa Mainstream Renewable Power Perdekraal East Pty Ltd	Environmental Resource Management (Pty) Ltd and Savannah Environmental Consultants (Pty) Ltd	Western Cape	Onshore Wind	150	Approved
12/12/20/1787	Scoping and EIA	Proposed Renewable Energy Facility at Konstabel	South Africa Mainstream Renewable Power Developments (Pty) Ltd	Environmental Resource Management (Pty) Ltd	Western Cape	Onshore Wind and Solar PV	170	Approved
12/12/20/1956	Scoping and EIA	Proposed Touwsrivier Solar Energy Facility	CPV Power Plant No.1 Pty Ltd	University of Cape Town Environmental Evaluation	Western Cape	Solar PV	36	Approved
12/12/20/1988	Scoping and EIA	Proposed Construction of the 750 MW Roggeveld Wind Farm within the Karoo Hoogland Local Municipality of the Northern Cape Province and within the Laingsburg Local Municipality of the Western Cape Province	G7 Renewable Energies Pty Ltd	Environmental Resource Management (Pty) Ltd	Western Cape	Onshore Wind	750	Approved

DEFF REFENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
12/12/20/1988/1/AM1	Amendment	Proposed Construction of the 750 MW Roggeveld Wind Farm within the Karoo Hoogland Local Municipality of the Northern Cape Province and within the Laingsburg Local Municipality of the Western Cape Province	G7 Renewable Energies Pty Ltd	Environmental Resource Management (Pty) Ltd	Western Cape	Onshore Wind	0	Approved
14/12/16/3/3/2/899	Scoping and EIA	140 MW Rietkloof WE, near Sutherland, Northern Cape and Western Cape	Rietkloof Wind Farm (Pty) Ltd	EOH Coastal and Environmental Services (Pty) Ltd	Western Cape	Onshore Wind	36	Approved
14/12/16/3/3/2/810	Scoping and EIA	75 MW Montague Road Solar PV SEF on Vredefort No. 34 Near Touws River within the Breede Valley Local Municipality in the Western Cape Province	Montague Road Energy (Pty) Ltd	Sharples Environmental Services cc	Western Cape	Solar PV	75	Approved
14/12/16/3/3/2/900	Scoping and EIA	147 MW Brandvalley Wind Energy Facility north of the town of Matjiesfontein within Karoo Hoogland Local Municipality	Brandvalley Wind Farm (Pty) Ltd.	EOH Coastal and Environmental Services	Western Cape	Onshore Wind	147	Approved
14/12/16/3/3/1/1983	BAR	Proposed Development of the Tooverberg On-site Eskom Substation and 132kV Power Line for the proposed Tooverberg Wind Energy Facility near Touws River, Western Cape Province	Genesis Tooverberg Wind Farm (Pty) Ltd	SiVEST SA (Pty) Ltd	Western Cape	EGI	EGI	Approved
Renewable Energy Projects – Source: SAHRIS, 2020								
14/12/16/3/3/1/1984	BAR	Proposed Development of the Tooverberg Wind Energy Facility (WEF) near Touws River, Western Cape Province	Genesis Tooverberg Wind Farm (Pty) Ltd	SiVEST SA (Pty) Ltd	Western Cape	Onshore Wind	264	Approved
Not provided	BAR	Powerline between the Perdkekraal West Wind Energy Facility and the Eskom Kappa Substation, Western Cape Province	Perderkraal West Wind Farm (Pty) Ltd	Savannah Environmental	Western Cape	EGI	EGI	Not confirmed
14/12/16/3/3/2/1115	Scoping and EIA	Proposed Construction of the 325MW Rondekop Wind Energy Facility between Matjiesfontein and Sutherland, Northern Cape Province	Rondekop Wind Farm (Pty) Ltd	SiVEST SA (Pty) Ltd	Northern Cape	Onshore Wind	325	Approved

Table D.2. Proposed and existing EGI projects within 30 km of the proposed projects (Source: Eskom GCCA 2020)

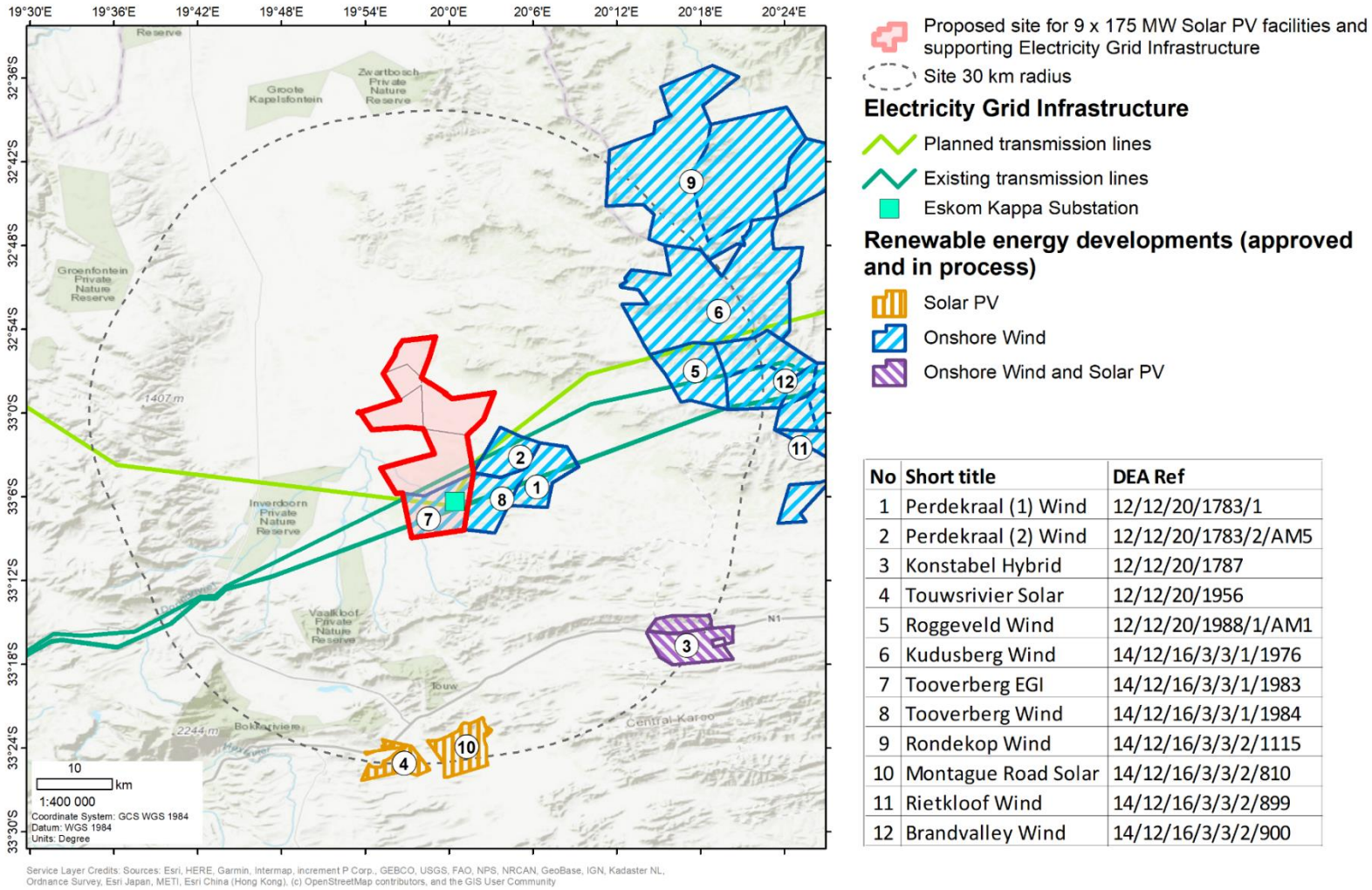
STATUS / LAYER SOURCE	TDP ID	TDP SCHEME	GP PROJECT
EGI Projects (Existing and Planned) – Source: Eskom GCCA 2020			
Tx Planned Lines	TS019	Cape Corridor Phase 4: 2nd Zeus-Per-Gam-Ome 765kV Line	GPP0288
Tx Planned Lines	TS019	Cape Corridor Phase 4: 2nd Zeus-Per-Gam-Ome 765kV Line	GPP0502
Tx Existing Lines	EXISTING	400kv_line	N/A
Tx Existing Lines	EXISTING	400kv_line	N/A
Tx Existing Lines	TS015	Cape Corridor Phase 2: Gamma-Omega 765kV Integration	GPP0283
Tx Existing Lines	TS015	Cape Corridor Phase 2: Gamma-Omega 765kV Integration	GPP0500

Table D.3. Proposed Veroniva PV Developments and EGI

DEFF REFENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
Proposed Veroniva PV Developments								
14/12/16/3/3/1/2273	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Witte Wall PV 1), near Touws River, Western Cape	Witte Wall PV 1 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2274	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Witte Wall PV 2), near Touws River, Western Cape	Witte Wall PV 2 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2275	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Grootfontein PV 1), near Touws River, Western Cape	Grootfontein PV 1 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2276	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Grootfontein PV 2), near Touws River, Western Cape	Grootfontein PV 2 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2277	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Grootfontein	Grootfontein PV 3 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress

DEFF REFENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
		PV 3), near Touws River, Western Cape						
14/12/16/3/3/1/2278	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 1), near Touws River, Western Cape	Hoek Doornen PV 1 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2279	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 2), near Touws River, Western Cape	Hoek Doornen PV 2 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2280	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 3), near Touws River, Western Cape	Hoek Doornen PV 3 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
14/12/16/3/3/1/2281	BA	Proposed Development of a 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 4), near Touws River, Western Cape	Hoek Doornen PV 4 (PTY) Ltd	CSIR	Western Cape	PV	175	BA in Progress
Proposed Veroniva EGI Developments								
14/12/16/3/3/1/2282	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Witte Wall PV 1), near Touws River, Western Cape	Witte Wall PV 1 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2283	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Witte Wall PV 2), near Touws River, Western Cape	Witte Wall PV 2 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2284	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Grootfontein PV 1), near Touws River, Western Cape	Grootfontein PV 1 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2285	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Grootfontein PV 2), near Touws River, Western Cape	Grootfontein PV 2 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2286	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic	Grootfontein PV 3 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress

DEFF REFENCE	EA PROCESS	PROJECT TITLE	APPLICANT	EAP	PROVINCE	TECHNOLOGY	MW	STATUS
		Facility and associated Infrastructure (i.e. Grootfontein PV 3), near Touws River, Western Cape						
14/12/16/3/3/1/2287	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 1), near Touws River, Western Cape	Hoek Doornen PV 1 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2288	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 2), near Touws River, Western Cape	Hoek Doornen PV 2 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2289	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 3), near Touws River, Western Cape	Hoek Doornen PV 3 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress
14/12/16/3/3/1/2290	BA	Proposed Development of Electrical Grid Infrastructure to support the proposed 175 MW Solar Photovoltaic Facility and associated Infrastructure (i.e. Hoek Doornen PV 4), near Touws River, Western Cape	Hoek Doornen PV 4 (PTY) Ltd	CSIR	Western Cape	EGI	N/A	BA in Progress



No	Short title	DEA Ref
1	Perdekraal (1) Wind	12/12/20/1783/1
2	Perdekraal (2) Wind	12/12/20/1783/2/AM5
3	Konstabel Hybrid	12/12/20/1787
4	Touwsrivier Solar	12/12/20/1956
5	Roggeveld Wind	12/12/20/1988/1/AM1
6	Kudusberg Wind	14/12/16/3/3/1/1976
7	Tooverberg EGI	14/12/16/3/3/1/1983
8	Tooverberg Wind	14/12/16/3/3/1/1984
9	Rondekop Wind	14/12/16/3/3/2/1115
10	Montague Road Solar	14/12/16/3/3/2/810
11	Rietkloof Wind	14/12/16/3/3/2/899
12	Brandvalley Wind	14/12/16/3/3/2/900

Figure D.1. Projects within the 30 km radius considered for the Cumulative Impact Assessment

In addition to the above, the impact assessment methodology includes the following aspects:

Nature of impact/risk - The type of effect that a proposed activity will have on the environment.

Status - Whether the impact/risk on the overall environment will be:
- Positive - environment overall will benefit from the impact/risk;
- Negative - environment overall will be adversely affected by the impact/risk; or
- Neutral - environment overall not be affected.

Spatial extent – The size of the area that will be affected by the impact/risk:
- Site specific;
- Local (<10 km from site);
- Regional (<100 km of site);
- National; or
- International (e.g. Greenhouse Gas emissions or migrant birds).

Duration – The timeframe during which the impact/risk will be experienced:
- Very short term (instantaneous);
- Short term (less than 1 year);
- Medium term (1 to 10 years);
- Long term (the impact will cease after the operational life of the activity (i.e. the impact or risk will occur for the project duration)); or
- Permanent (mitigation will not occur in such a way or in such a time span that the impact can be considered transient (i.e. the impact will occur beyond the project decommissioning)).

Consequence – The anticipated consequence of the risk/impact:
- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).

Reversibility of the Impacts - the extent to which the impacts/risks are reversible assuming that the project has reached the end of its life cycle (decommissioning phase):
- High reversibility of impacts (impact is highly reversible at end of project life i.e. this is the most favourable assessment for the environment);
- Moderate reversibility of impacts;
- Low reversibility of impacts; or
- Impacts are non-reversible (impact is permanent, i.e. this is the least favourable assessment for the environment).

Irreplaceability of Receiving Environment/Resource Loss caused by impacts/risks – the degree to which the impact causes irreplaceable loss of resources assuming that the project has reached the end of its life cycle (decommissioning phase):

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or
- Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

Using the criteria above, the impacts are further assessed in terms of the following:

Probability – The probability of the impact/risk occurring:

- Extremely unlikely (little to no chance of occurring);
- Very unlikely (<30% chance of occurring);
- Unlikely (30-50% chance of occurring)
- Likely (51 – 90% chance of occurring); or
- Very Likely (>90% chance of occurring regardless of prevention measures).

To determine the significance of the identified impact/risk, the consequence is multiplied by probability (qualitatively as shown in Figure D.2). This approach incorporates internationally recognised methods from the Intergovernmental Panel on Climate Change (IPCC) (2014) assessment of the effects of climate change and is based on an interpretation of existing information in relation to the proposed activity, to generate an integrated picture of the risks related to a specified activity in a given location, with and without mitigation. Risk is assessed for each significant stressor (e.g. physical disturbance), on each different type of receiving entity (e.g. the municipal capacity, a sensitive wetland), qualitatively (very low, low, moderate, high, and very high) against a predefined set of criteria (i.e. probability and consequence):

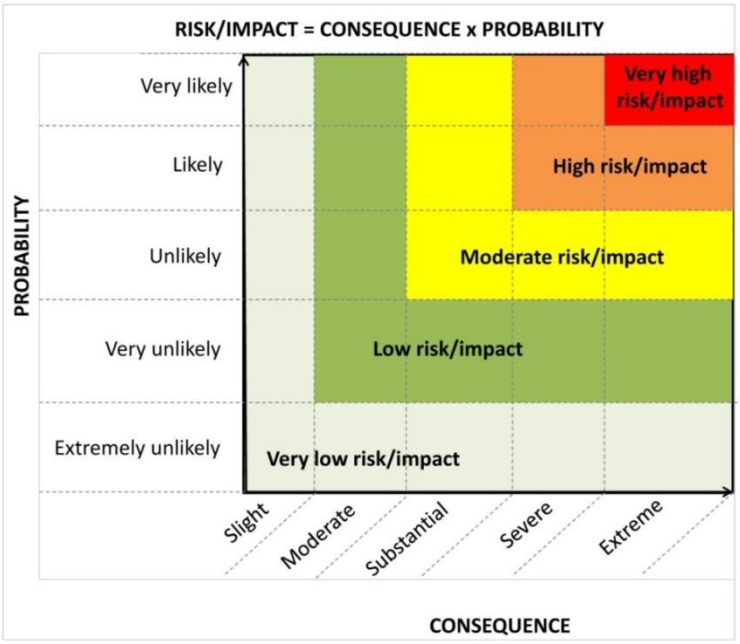


Figure D.2. Guide to assessing risk/impact significance as a result of consequence and probability

Significance – Will the impact cause a notable alteration of the environment?

- Very low (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Low (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making);
- Moderate (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated);
- High (the risk/impact will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making); and
- Very high (the risk/impact will result in very major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making (i.e. the project cannot be authorised unless major changes to the engineering design are carried out to reduce the significance rating)).

With the implementation of mitigation measures, the residual impacts/risks will be ranked as follows in terms of significance (based on Figure D.2):

- Very low = 5;
- Low = 4;
- Moderate = 3;
- High = 2; and
- Very high = 1.

Confidence – The degree of confidence in predictions based on available information and specialist knowledge:

- Low;
- Medium; or
- High.

Impacts have been collated into the EMPr (Appendix G and Appendix H of the BA Report) and these include the following:

- Quantifiable standards for measuring and monitoring mitigatory measures and enhancements (as applicable). This includes a programme for monitoring and reviewing the recommendations to ensure their ongoing effectiveness.
- Identifying negative impacts and prescribing mitigation measures to avoid or reduce negative impacts. Where no mitigatory measures are possible this is stated.
- Positive impacts and augmentation measures have been identified to potentially enhance positive impacts where possible.

Other aspects to be taken into consideration in the assessment of impact significance are:

- Impacts are evaluated for the construction and operational phases of the development. The assessment of impacts for the decommissioning phase is brief, as there is limited understanding at this stage of what this might entail. The relevant rehabilitation guidelines and legal requirements applicable at the time will need to be applied;
- Impacts have been evaluated with and without mitigation in order to determine the effectiveness of mitigation measures on reducing the significance of a particular impact;

- The impact evaluation has, where possible, taken into consideration the cumulative effects associated with this and other facilities/projects which are either developed or in the process of being developed in the local area; and
- The impact assessment attempts to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

D.2 Assessment of Environmental Risks and Impacts

The issues and impacts presented in this Section have been identified via the environmental *status quo* of the receiving environment (environmental, social and heritage features present on site - as discussed in Section B of this BA Report) and input from specialists that form part of the project team. The impact assessments of the specialist studies undertaken to inform this BA have been summarised in this section. It should be noted that unless otherwise stated, impacts identified and their associated significance are deemed to be negative.

Refer to Appendix C of this report for the full specialist studies undertaken (including the Terms of Reference for each study). All proposed mitigation measures, as relevant, have been carried over into the EMPr, included in Appendix G and Appendix H of this report.

D.2.1 Agriculture

The Agriculture Compliance Statement was undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statement is included in Appendix C.1 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Agriculture Compliance Statement. The information below is extracted from Lanz (2020) (Appendix C.1 of the BA Report).

D.2.1.1 Approach and Methodology

An Agricultural Compliance Statement was required and undertaken in terms of the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more*, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998). As per the requirement of the Protocol in GN 320, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site. Various information and desktop sources of information were used.

D.2.1.2 Relevant Project Aspects relating to Agricultural Impacts

For agricultural impacts, the exact nature of the different infrastructure within a development has very little bearing on the significance of impacts. What is of most relevance is simply the occupation of the land and whether it is being occupied by a solar panel, a road, a building or a substation makes no difference. What is of most relevance and addressed in this assessment, therefore, is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land.

D.2.1.3 Potential Impacts

The following potential negative agricultural impacts have been identified:

- Loss of agricultural land use - Agricultural land directly occupied by the development infrastructure will become unavailable for agricultural use. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.
- Soil degradation - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth. This impact is relevant only during the construction and decommissioning phases.

The study also notes that deterioration (or improvement) of public road conditions could have a potential agricultural impact because agriculture makes use of the roads for transport. The significance of the impact will be determined by the extent to which roads will change, and then the extent to which that is likely to influence farm profitability. The Traffic Impact Statement (included in Appendix I of this Final BA Report) recognises that heavy traffic contributes to the deterioration of the road surfaces and proposes regular maintenance of access roads by the contractor and ensuring that access roads are restored to original pre-construction road condition as mitigation. With mitigation the significance of this impact is rated as very low. The knock-on effect impact on farm profitability will therefore also be very low.

However, EGI has negligible agricultural impact in this study area for the following two reasons:

- Overhead transmission lines have no agricultural impact because all agricultural activities that are viable in this environment (grazing) can continue completely unhindered underneath transmission lines.
- The direct, permanent, physical footprint of the EGI that has any potential to interfere with agriculture is restricted to pylon bases and substation footprints that, in the context of the agricultural environment of extremely low density grazing on farms which are typically thousands of hectares large, is entirely insignificant.

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of agricultural land, with a consequent decrease in agricultural production. There are eleven other renewable energy project applications within 30 km of the proposed sites (as indicated in Table D.1). In addition, the nine separate proposed Veroniva PV projects (with a total of nine power lines, substations and BESS's) have also been included in the consideration of cumulative impact. Because of the negligible agricultural impacts of EGI, the agricultural environment can accommodate far more EGI than currently exists, or is currently proposed, before acceptable levels of change are exceeded.

It should also be noted that there are few land uses, other than renewable energy, that are competing for agricultural land use in this area. The cumulative impact from developments, other than renewable energy, is therefore likely to be low.

Due to all of the considerations discussed above, the cumulative impact of loss of agricultural land use will not have an unacceptable negative impact on the agricultural production capability of the

area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it is approved.

D.2.1.4 Concluding Statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed development is therefore acceptable. This is substantiated by the following points:

- The amount of agricultural land loss is within the allowable development limits prescribed by the agricultural protocol. These limits reflect the national need to conserve valuable agricultural land and therefore to steer, particularly renewable energy developments, onto land with low agricultural production potential.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by mitigation management actions. In addition, the degradation risk is only to land of low agricultural value, and the significance of the impact is therefore low.

Therefore, from an agricultural impact point of view, it is recommended that the proposed development be approved.

D.2.2 Visual Impact Assessment

The Visual Impact Assessment was undertaken by Quinton Lawson and Bernard Oberholzer to inform the outcome of this BA from a visual perspective. The complete Visual Impact Assessment is included in Appendix C.2 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Visual Impact Assessment. The information below is extracted from Lawson and Oberholzer (2020) (Appendix C.2 of the BA Report).

D.2.2.1 Approach and Methodology

The methodology of the Visual Impact Assessment involved a number of standard procedures including those in the “Guideline for Involving Visual and Aesthetic Specialists” (Oberholzer,2005), including the following steps:

- A baseline survey of existing scenic resources and visual characteristics of the study area was made, including desktop work and field observations.
- A photographic survey included views from potentially sensitive receptor locations. A number of cameras were used to record features and determine the Global Positioning System (GPS) coordinates and compass direction of viewpoints.
- View corridors / routes and important viewpoints / receptors were mapped in relation to the proposed Solar Energy Facilities (SEFs).

- Distance radii from the proposed SEFs were mapped to determine its potential visibility from the identified viewpoints.
- The viewsheds of the proposed SEFs and connecting power lines were mapped to determine their zones of visual influence as well as those areas in a view shadow.
- Photomontages were constructed from selected viewpoints using panoramic photographs taken in the field, along with digital terrain modelling and superimposing a 3D model of the proposed SEFs. The montages give a realistic impression of the proposed SEFs from the identified viewpoints at a range of distances.
- The potential visibility, zone of visual influence and photomontages of the proposed SEFs provided a quantitative measure of visual impact intensity.
- Existing vegetation cover, land uses, topographic features and general intactness of the landscape, along with the overall “sense of place” provided a qualitative measure of visual impact intensity.
- Potential impacts identified in the visual specialist study have been assessed based on the criteria and methodology outlined in Section D.1 of this BA Report.
- A site inspection was carried out over a full day on 27 August 2020 by two principal visual specialists. The season was not a consideration, nor had any effect on carrying out a visual assessment. Clear visibility was required for the photographic survey.

Various base data was used in the assessment.

D.2.2.2 Relevant Project Aspects relating to Visual Impacts

Components of the proposed project that are relevant in terms of visual aspects are those typically associated with such developments, with a specific focus on overhead power lines.

D.2.2.3 Potential Impacts

The potential visual impacts resulting from the proposed projects on landscape features and receptors are listed below for each of the project phases, including cumulative impacts. The potential visual impacts would be identical for each of the proposed PV facilities. The impacts identified are direct and cumulative impacts. No indirect impacts have been identified.

Construction Phase:

- Potential effect of dust and noise from construction machinery during the construction of the substation and pylons, and the effect of this on residents and visitors to the area.
- Potential visual effect of access roads, stockpiles and construction camps in the exposed landscape.

Operational Phase:

- Potential visual intrusion of substations and power lines, and the impact on receptors, particularly where power lines cross roads.
- Potential visual impact of industrial type activities on the rural or wilderness character of the area.

Decommissioning Phase

- Potential visual effect of any remaining electrical grid structures and disused roads on the landscape.

Cumulative Impacts

- Potential combined visual effect of the nine Solar PV Facilities, nine power lines, as well as the nearby existing Perdekraal WEF. This would potentially result in the visual effect of nine connecting power lines to the ESKOM Kappa substation.

D.2.2.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the proposed project for the construction, operational and decommissioning phases.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Impact 1 and Impact 2 for the construction phase	*Status*	**Negative**	**Low risk (Level 4)**	▪ Locate construction camps and stockpiles in visually unobtrusive areas, away from public roads. ▪ Implement the EMPr with an ECO during construction.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**Medium**				
	Irreplaceability	**Low**				
DIRECT IMPACTS - OPERATIONAL PHASE						
Impact 1 and Impact 2 for the operational phase	*Status*	**Negative**	**Low risk (Level 4)**	▪ Locate substations in unobtrusive low-lying areas, away from public roads. ▪ Avoid power lines on hillcrests and ridge skylines where possible. ▪ Use monopoles in preference to lattice pylons. ▪ Keep maintenance / access roads as narrow as possible, and use existing roads or tracks as far as possible. ▪ Fit outdoor or security lighting at substations with reflectors to minimise light spillage.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Moderate**				
	Probability	**Very Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
DIRECT IMPACTS - DECOMMISSIONING PHASE						
Impact 1 for the decommissioning phase	*Status*	**Negative**	**Low risk (Level 4)**	▪ Remove or recycle the pylons and associated EGI. ▪ Rip and regrade hardened platform areas and access roads no longer required. ▪ Revegetate or return to grazing exposed or disturbed areas to blend with the surroundings.	**Very low risk (Level 5)**	**Medium**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **cumulative impacts** identified for the proposed project for the construction, operational and decommissioning phases.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS - CONSTRUCTION PHASE						
Cumulative Impact 1 for the construction phase	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Combine the connecting power lines from Witte Wall, Grootfontein and Hoek Doornen, where possible. ▪ Implement the EMPr with an ECO during construction.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Short Term**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
CUMULATIVE IMPACTS - OPERATIONAL PHASE						
Cumulative Impact 1 for the operational phase	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Combine the connecting power lines from Witte Wall, Grootfontein and Hoek Doornen, where possible. ▪ Locate substations in unobtrusive low-lying areas, away from public roads. ▪ Avoid power lines on hillcrests and ridge skylines where possible. ▪ Use monopoles in preference to lattice pylons. ▪ Keep maintenance / access roads as narrow as possible, and use existing roads or tracks as far as possible. ▪ Fit outdoor or security lighting at substations with reflectors to minimise light spillage.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
CUMULATIVE IMPACTS - DECOMMISSIONING PHASE						
Cumulative Impact 1 for the decommissioning phase	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Remove or recycle the pylons and associated EGI. ▪ Rip and regrade hardened platform areas and access roads no longer required. ▪ Revegetate or return to grazing exposed or disturbed areas to blend with the surroundings.	**Very low risk (Level 5)**	**Medium**
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

D.2.2.5 Concluding Statement

The EGI would have a low risk significance after mitigation, provided the proposed power lines leading to the Eskom Kappa substation to the south of the study area are consolidated. (Although nine power lines have been assessed, in reality a maximum of four power lines from the project sites to the Kappa Substation would be constructed, depending on the bidding process).

Although the potential cumulative visual impacts, when combined with the nine power lines and nine PV facilities, as well as the existing Perdekraal WEF, could result in a semi-industrialised landscape, the proposed solar PV facilities tend to have less visual significance than the larger scale wind farms. It would be important however for power lines to be shared where possible, to avoid the proliferation of these in the exposed landscape.

There are no fatal flaws from a visual perspective arising from the proposed projects, and given the marginal nature of agriculture in the area, the project is probably an inherently suitable land use that should receive authorisation, provided the mitigation measures are implemented as a condition of approval.

D.2.3 Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by Dr. Jayson Orton to inform the outcome of this BA from an archaeology and cultural landscape perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete Heritage Impact Assessment is included in Appendix C.3 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Heritage Impact Assessment. The information below is extracted from Orton (2020) (Appendix C.3 of the BA Report).

D.2.3.1 Approach and Methodology

A Heritage Impact Assessment is a means of identifying any significant heritage resources before development begins so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. The Heritage Impact Assessment aims to fulfil the requirements of the heritage authorities such that a comment can be issued by them for consideration by the DEFF. The Heritage Impact Assessment outlines any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted. The methodology of the Heritage Impact Assessment involved a literature review, field survey, impact assessment and grading of the sites found on site.

D.2.3.2 Relevant Project Aspects relating to Heritage Impacts

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains, while the above-ground aspects create potential visual (contextual) impacts to the cultural landscape and any significant heritage sites that might be visually sensitive.

D.2.3.3 Potential Impacts

The potential impacts identified during the Heritage Impact Assessment include:

Construction Phase
- Potential impacts to palaeontological resources
- Potential impacts to archaeological resources and graves
- Potential visual impacts to the cultural landscape

Operational Phase
- Potential visual impacts to the cultural landscape

Decommissioning Phase
- Potential visual impacts to the cultural landscape

Cumulative impacts
- Potential impacts to palaeontological resources
- Potential impacts to archaeological resources
- Potential impacts to the cultural landscape

No indirect impacts are anticipated for the Heritage Impact Assessment.

D.2.3.4 Impact Assessment

The assessments for palaeontology are provided in the following section in terms of potential **direct impacts** for he construction, operational and decommissioning phases.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Potential impacts to archaeological resources and graves	*Status*	**Negative**	**Low risk (Level 4)**	▪ A detailed pre-construction survey of the final layouts should be undertaken in order to determine appropriate sample areas from which to collect artefacts. There is a small possibility that more significant sites or even graves may be found. ▪ While background scatter artefacts occur widely and in variable densities across the landscape, it is suggested that one area per PV project footprint could be collected from in order to record some of the variability across the wider project area. Note that in the Witte Wall PV 2 area there is a small scatter of pottery that must also be collected during this exercise. ▪ The ECO should also ensure that all staff are alerted to the possibility of finding archaeological resources and instructed to report any unusual finds.	**Very low risk (Level 5)**	**High**
	Spatial Extent	**Site specific**				
	Duration	**Permanent**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**Non-reversible**				
	Irreplaceability	**High**				
Potential impacts to the cultural landscape	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Minimise disturbance footprint. ▪ Employ dust suppression measures. ▪ Ensure effective rehabilitation of areas not needed during operation. ▪ Locate the laydown area, batching plant (if needed) and buildings as far from public roads as possible. ▪ Use natural colours and finishes on buildings.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Medium term**				
	Consequence	**Substantial**				
	Probability	**Very likely**				
	Reversibility	**Non-reversible**				
	Irreplaceability	**High**				
DIRECT IMPACTS - OPERATIONAL PHASE						
Potential impacts to the cultural landscape	*Status*	**Negative**	**Low risk (Level 4)**	▪ Security lighting should be directed to minimise light pollution. ▪ Signage should be as small and unobtrusive as possible.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
	Reversibility	**Non-reversible**				
	Irreplaceability	**High**				
DIRECT IMPACTS - DECOMMISSIONING PHASE						
Potential impacts to the cultural landscape	*Status*	**Negative**	**Moderate (Level 3)**	▪ Employ best practice. ▪ Minimise the disturbance footprint. ▪ Employ dust suppression measures. ▪ Ensure effective rehabilitation of all areas.	**Low (Level 4)**	**Medium**
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Very likely**				
	Reversibility	**Non-reversible**				
	Irreplaceability	**High**				

The table below includes an assessment of the potential **cumulative impacts** for the construction, operational and decommissioning phases. Note that because the various facilities in the landscape will be built, operated and decommissioned at different times, there is no distinction made between the project phases for cumulative impacts.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS – CONSTRUCTION; OPERATIONAL AND DECOMMISSIONING PHASES						
Cumulative impacts to all heritage resources	*Status*	**Negative**	**Moderate (Level 3)**	▪ Pre-construction archaeological surveys with sampling as needed. ▪ Minimise areas disturbed. ▪ Minimise light pollution and signage. ▪ Effective rehabilitation	**Moderate (Level 3)**	**High**
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Very likely**				
	Reversibility	**Reversible**				
	Irreplaceability	**High**				

D.2.3.5 Concluding Statement

Because no significant impacts to culturally significant heritage resources are anticipated and impacts of low significance can be easily managed or mitigated, the proposed developments should be authorised in full.

D.2.4 Palaeontology Impact Assessment

The Palaeontology Impact Assessment was undertaken by Dr. John Almond to inform the outcome of this BA from a palaeontological perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project in line with the requirements of HWC. However, for ease of reference, this section only deals with the Palaeontology. The complete Heritage Impact Assessment is included in Appendix C.3 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Palaeontology input to the Heritage Impact Assessment. The information below is extracted from Almond (2020) (Appendix C.3 of the BA Report).

D.2.4.1 Approach and Methodology

The approach to this palaeontological heritage study can be briefly summarized as follows. Fossil bearing rock units occurring within the broader study area (including all relevant land parcels) were determined from geological maps and relevant geological sheet explanations as well as satellite images. Known fossil heritage associated with each rock unit was inventoried from published and unpublished scientific literature, previous PIAs of the broader study region, and the author's field experience and palaeontological database (Almond & Pether, 2008). Based on this data as well as field examination of representative exposures of all major sedimentary rock units present, both within and in the vicinity of the project footprint, the impact significance, including cumulative impacts, of the proposed developments was assessed. Recommendations for any further studies or mitigation were also outlined for inclusion within the EMPr.

In the case of the present solar PV facility and associated infrastructure assessments, several transects across the stratigraphy underlying the affected land parcels were made over the course of four days in order to gauge the levels of exposure, weathering, tectonic deformation and palaeontological sensitivity of each of the sedimentary rock units represented.

D.2.4.2 Relevant Project Aspects relating to Palaeontological Impacts

All aspects of the proposed development are relevant since excavations for foundations may impact on archaeological and/or palaeontological remains.

D.2.4.3 Potential Impacts

The key impacts on local palaeontological heritage resources considered are direct and relate to the potential disturbance, damage, destruction or sealing-in of scientifically-important and legally-protected fossils preserved at or beneath the surface of the ground due to construction phase excavations (e.g. building foundations, underground cables, storm water channels), and ground clearance (e.g. access roads).

The impacts identified only apply to the construction phase of the proposed developments since further significant impacts on fossil heritage during the planning, operational and decommissioning phases of the facilities are not anticipated.

It should be noted that, should the recommended mitigation measures for the construction phase of the solar PV developments be fully and consistently implemented, the impact significance would remain very low but would entail both *positive* and negative impacts. Residual negative impacts from inevitable loss of some fossil heritage would be partially offset by an improved palaeontological database for the study region as a direct result of appropriate mitigation. This is a positive outcome because any new, well-recorded and suitably-curated fossil material from this palaeontologically little-known region would constitute a useful addition to our scientific understanding of South African fossil heritage.

Construction Phase

- Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance.

Cumulative impacts

- Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance.

No indirect impacts were identified for the Palaeontology Impact Assessment.

D.2.4.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** for the construction phase.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	*Status*	**Negative**	**Very low risk (Level 5)**	▪ Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the Environmental Control Officer (ECO) on an on-going basis during the construction phase. ▪ Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist (Contact details: Heritage Western Cape. Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). ▪ Professional mitigation, involving the recording and judicious sampling of fossil material together with pertinent field data (stratigraphy, taphonomy), should conform to best practice. Fossil material collected must be curated within an approved repository (university or museum collection). ▪ Refer to and implement the general protocol for Chance Fossil Finds which is appended to the Palaeontology Impact Assessment Report (Appendix C.3 of the BA Report).	**Very low risk (Level 5)**	**Medium**
	Spatial Extent	**Site specific**				
	Duration	**Permanent**				
	Consequence	**Slight**				
	Probability	**Very likely**				
	Reversibility	**Non-reversible**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **cumulative impacts** for the construction phase.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS - CONSTRUCTION PHASE						
Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance	*Status*	**Negative**	**Low risk (Level 4)**	▪ Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the Environmental Control Officer (ECO) on an on-going basis during the construction phase. ▪ Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist (Contact details: Heritage Western Cape. Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). ▪ Professional mitigation, involving the recording and judicious sampling of fossil material together with pertinent field data (stratigraphy, taphonomy), should conform to best practice. Fossil material collected must be curated within an approved repository (university or museum collection). ▪ Refer to and implement the general protocol for Chance Fossil Finds which is appended to the Palaeontology Impact Assessment Report (Appendix C.3 of the BA Report).	**Very low risk (Level 5)**	**Medium**
	Spatial Extent	**Site specific**				
	Duration	**Permanent**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**Non-reversible**				
	Irreplaceability	**Low**				

D.2.4.5 Concluding Statement

As a consequence of (1) the paucity of irreplaceable, unique or rare fossil remains within the development footprint, as well as (2) the extensive superficial sediment cover overlying most potentially-fossiliferous bedrocks within the solar PV facility project areas, the overall impact significance of the construction phase of the proposed solar PV facilities regarding legally-protected palaeontological heritage resources is assessed as **very low** (negative status), with and without mitigation. Confidence levels for this assessment are medium, given the generally low exposure levels of potentially-fossiliferous bedrocks.

Anticipated cumulative impacts in the context of other renewable energy projects in the Ceres Karoo region – including the nine proposed solar PV facilities and power lines - are assessed as **low** (negative) without mitigation but **very low** (negative) with mitigation. It is concluded that as far as fossil heritage resources are concerned, the proposed solar facility projects, whether considered individually or together, will not result in an unacceptable loss or unacceptable additional impacts, considering all the renewable energy projects proposed in the area. This analysis only applies provided that all the proposed monitoring and mitigation recommendations made for all these various projects are consistently and fully implemented.

No specialist palaeontological monitoring or mitigation is recommended for this development, pending the potential discovery of significant new fossil material here during the construction phase.

There are no identified fatal flaws and no objections on palaeontological heritage grounds to authorisation of the proposed solar PV facilities.

D.2.5 Terrestrial Biodiversity and Species

The Terrestrial Biodiversity and Species Assessment was undertaken by Simon Bundy, Luke Maingard, and Alex Whitehead of Sustainable Development Projects cc to inform the outcome of this BA from a terrestrial biodiversity and species perspective. The complete Terrestrial Biodiversity and Species Assessment is included in Appendix C.4 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Terrestrial Biodiversity and Species Assessment. The information below is extracted from Bundy *et. al.* (2020) (Appendix C.4 of the BA Report).

D.2.5.1 Approach and Methodology

The approach and methodology adopted in the Terrestrial Biodiversity and Species Assessment is described in this section.

A biophysical reconnaissance and site evaluation of the assessed area was undertaken over a 5-day period in September 2020, during which specific primary data was collected and evaluated. In addition, the identification of key terrestrial ecological features on site and an interpretation of the prevailing habitat form were undertaken. The study also included a literature review of the region to confirm or corroborate findings, as well as to consider the likelihood of specific fauna that may be of conservation value. The literature review utilized various sources including the South African National Biodiversity Institute (SANBI) data and other relevant sources. In addition, recent and historical aerial imagery of the site was also reviewed in order to identify points for investigation during the field survey.

All data collected in the field and during the literature review was evaluated and interpreted in order to provide an understanding of the nature of the prevailing environment at a landscape and habitat level, together with specific evaluation of data relating to habitat form and structure. The evaluation also sought to identify any anomalies within the prevailing environment. Such variance may be considered to be indicative of differing habitat forms, which under consideration, may be of higher order ecological value in relation to the prevailing environment.

The following key approach was used for evaluating the study area on site:

- Identification of the key ecological drivers within the region and determination of their relevance within the site;
- Identification of habitat forms and structures within site and identification of their ecological significance;
- Consideration was then given to the applicability of establishing the proposed development in terms of the following:
    - The identification of areas where habitat forms will not be directly affected by the proposed development;
    - The identification of areas of the site where the proposed development will not adversely affect the key drivers of terrestrial habitat;
    - Consideration of the presence or absence of specific fauna within the site;
    - The identification of areas of the site where biophysical factors will not adversely affect the proposed development; and
    - Other specific issues that may be of relevance e.g. specific high faunal populations within specific areas.

In order to evaluate faunal presence and composition the following actions were undertaken:

- A review of the site was undertaken to identify specific features, in particular habitat conducive to the presence of *Bunolagus monticularis* (Riverine Rabbit). As discussed above, a separate specific camera trapping exercise was undertaken by Simon Todd of 3 Foxes Biodiversity Solutions to determine the presence of Riverine Rabbit, and to provide recommendations and management actions. The Riverine Rabbit Report is included in Appendix F of the Terrestrial Biodiversity and Species Assessment (which is included in Appendix C.4 of this BA Report).
- Additional cameras were placed at points in the study area by the authors of the Terrestrial Biodiversity and Species Assessment.
- Specific habitat was traversed on foot (river bed and across scarps) identifying inter alia evidence of fauna (through spoor, scat or other features) or actual siting of specimens. The presence of such species was noted in relation to the habitat under investigation.
- Nocturnal assessments were undertaken on two nights.

D.2.5.2 Relevant Project Aspects relating to Terrestrial Biodiversity and Species Impacts

The development of a PV facility and associated infrastructure within the study area will by necessity, be undertaken on land that meets a number of criteria including, inter-alia, level or gradual falls, generally suitable founding conditions and avoidance of areas that may be inundated by flooding. As a consequence, the proposed PV facilities will avoid all riverine and wetland environments. The proposed projects will see a land use change that differs significantly from the prevailing land use. The implementation of the proposed development will result in notable change to the prevailing

catchment associated with the river systems in the area, primarily on account of the construction phase, as well as the long-term operational stage.

The commencement of construction on site will entail low to significant alteration of the prevailing habitat, depending upon the final design and layout of the PV facilities. A general sequestering of the study area, through the fencing of the site from the surrounding habitat forms will thus arise. While the construction phase will see temporary disturbances and transformation to the environment, these impacts on the prevailing ecology are likely to be significant in terms of impact, but of short temporal extent, as the construction project rolls out and a stability, albeit within a differing environment, arises on the site.

D.2.5.3 Potential Impacts

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. Direct impacts are those that are directly attributable to the implementation and operation of the project, while indirect impacts are consequential effects of the proposed project that may not be directly attributable to the development. Cumulative impacts are those externalities that arise from the proposed development and compound existing effects or influences on the ecology of the region. These impacts occur during the construction, operational and decommissioning phases, as relevant, and are listed below.

Construction Phase:

- Potential Impact 1: Alteration of habitat structure and composition;
- Potential Impact 2: Ousting (and recruitment) of various fauna;
- Potential Impact 3: Changes in the geomorphological state of drainage patterns due to construction activities leading to change in the eco-morphology of lower lying areas and those immediately adjacent to it;
- Potential Impact 4: Increased electrical light pollution (ELP) leading to changes in nocturnal behavioural patterns of fauna;
- Potential Impact 5: Exclusion or entrapment of (in particular) large fauna, on account of the fencing of the site;
- Potential Impact 6: Changes in edaphics (soils) on account of excavation and import of soils, leading to the alteration of plant communities and fossorial species in and around these points;
- Potential Impact 7: Changes in subsurface water resources arising from alteration of percolation and recharge at points;
- Potential Impact 8: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) as a result of construction activities;
- Potential Impact 9: Exotic weed invasion;
- Potential Impact 10: Clearance of vegetation to establish roadways and other infrastructure;
- Potential Impact 11: Increased dust levels due movement of traffic and other construction related factors will affect factors such as palatability of vegetation;
- Potential Impact 12: Incidental pollution events, including the loss of solid waste, spillage of liquids such as hydrocarbons and other fuels as well as possible sewerage and other waste, which is likely to alter selected points within the subject site, possibly affecting habitat form and other factors; and
- Potential Impact 13: General disturbance on account of pedestrian movement and activities on site.

Operational Phase:

- Potential Impact 14: Continued alteration of habitat structure and composition on account of continuing low level anthropogenic impacts, such as "shading of vegetation" from arrays and general disturbance on account of pedestrian movement and activities on site;
- Potential Impact 15: Ousting (and recruitment) of various fauna on account of long term changes in the surrounding habitat/environment. The isolation of the site by a fence (perhaps electrified), will alter faunal ethos, while a changed habitat within the site may act to encourage faunal passage into the site. The fence may also alter predator – prey relationships both within and adjacent to the site, where prey is cordoned on account of the presence of fencing (e.g. jackals may use fencing to direct and run down prey);
- Potential Impact 16: Changes in the geomorphological state of drainage lines on account of long term climatic changes and the concomitant change in the nature of the catchment arising from the land use change;
- Potential Impact 17: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities. Incidental pollution events are likely to continue throughout the operational stage. If tracking modules are utilised spills of hydraulic fluid may arise or other spillages may be evident. Small volumes of sewerage may be introduced into the localised environment from operational offices, while solid waste may arise within the site from time to time. Such changes will be related to the long term activities on site, but are likely to be negligible; and
- Potential Impact 18: Exotic weed invasion as a consequence of regular and continued disturbance of site.

Decommissioning Phase:

Such alterations and changes will be dependent upon the expectant post-decommissioning land use and operation cease of the PV Facilities and associated infrastructure. However, abandonment of the site would probably result in:

- Potential Impact 19: A reversion to an early seral stage;
- Potential Impact 20: A reversion of present faunal population states within the study area, with some variation to these populations being possible;
- Potential Impact 21: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment; and
- Potential Impact 22: Exotic weed invasion as a consequence of abandonment of site and cessation of weed control measures.

Indirect Impacts:

- Potential Impact 23: Changes in broader landscape ecology through alteration of eco-morphological drivers.
- Potential Impact 24: Changes in faunal ethos as a result of the establishment of the PV facilities and associated infrastructure.

Cumulative Impacts:

The cumulative assessment considers all nine proposed PV plants and nine power lines as part of this suite of developments (referred to as the Ceres PV Development) and 11 other renewable energy projects that have received EA within 30 km of the subject site. The cumulative impact assessment also considers other proposed, approved and existing power lines within the 30 km radius.

Given the above, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:

- Potential Impact 25: Alteration of habitat structure and composition, albeit primarily sporadic in nature, over an extensive and wide area.
- Potential Impact 26: Changes in faunal populations through exclusion of certain species and beneficiation of others over an extensive and wide area – primarily on account of change in habitat as well as the implementation of security fencing;
- Potential Impact 27: Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment;
- Potential Impact 28: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment; and
- Potential Impact 29: Exotic weed invasion as a consequence of regular and continued disturbance across an extensive area of site.

D.2.5.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** for the **construction phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Impact 1: Alteration of habitat structure and composition	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Implement general management principles as per the EMPr to ensure that the site is managed appropriately.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 2: Ousting (and recruitment) of various fauna	*Status*	**Negative**	**High risk (Level 2)**	▪ Exclusion areas should be maintained. Maintain scarp slopes and ensure that they are unimpeded by the proposed development. ▪ Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna. ▪ Implement other general management principles as per the EMPr.	**Moderate risk (Level 3)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Severe**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 3: Changes in the geomorphological state of drainage patterns	*Status*	**Negative**	**High risk (Level 2)**	▪ Exclusion areas should be maintained. Maintain scarp slopes unimpeded by development. Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna ▪ Implement other general management principles as per the EMPr.	**Moderate risk (Level 3)** / **Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Severe**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 4: Increased ELP	*Status*	**Negative**	**Low risk (Level 4)**	▪ Ensure reduced security lighting, downward lighting and restriction on lumens employed	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 5: Exclusion or entrapment of (in particular) large fauna	*Status*	**Negative**	**Low risk (Level 4)**	▪ Ensure regular flushing of the area throughout the construction phase.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 6: Changes in edaphics (soils) due to excavation and import of soils, leading to the alteration of plant communities and fossorial species in and around these points	*Status*	**Negative**	**Low risk (Level 4)**	▪ Ensure construction activities are limited to the development foot print in order to minimise the extent of impact.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 7: Changes in subsurface water resources arising from alteration of percolation and recharge at points	*Status*	**Negative**	**Low risk (Level 4)**	▪ Provide adequate storm water controls to ensure that attenuation of storm water runoff emanating from the PV panels and other hard panned surfaces is achieved.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 8: Changes in water resources and surface water in terms of water quality	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Ensure all hazardous materials are adequately stock piled in a leak proof receptacle. ▪ Ensure a spill kit is placed on site in order to contain any hydrocarbon leaks if necessary.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
Impact 9: Exotic weed invasion	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Limit construction activities to the development footprint to lessen disturbance within the area. ▪ The removal through mechanical or application of a herbicide is likely to be required in order to curtail proliferation. Note that the appointed Environmental Control Officer (ECO) of the project is to be consulted prior to application of the herbicide.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 10: Clearance of vegetation to establish roadways and other infrastructure	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Specimens to be relocated if possible, through plant rescue. ▪ Clearance activities are to be strictly confined to the development foot print. ▪ Clearance is to be carried out where needed to accommodate infrastructure.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 11: Dust – according to movement of traffic and other construction related factors will affect factors such as palatability of vegetation	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Impose a speed limit on construction vehicles operating within the construction site.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 12: Incidental pollution events, including the loss of solid waste, spillage of liquids such as hydrocarbons and other fuels as well as possible	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ A waste management plan is to be compiled and implemented onsite ▪ A spill kit is to be placed on site in order to curtail and contain any hydrocarbon spill. ▪ A designated waste area is to be placed within a suitable	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
sewerage and other waste is likely to alter select points within the subject site, possibly affecting habitat form and other factors.	*Probability*	**Likely**		place onsite, which is to be identified by the appointed ECO.		
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 13: General disturbance on account of pedestrian movement and activities on site	*Status*	Negative	**Moderate risk (Level 3)**	▪ Limit pedestrian/labour movement to within the confines of the site. ▪ Appropriate signage and environmental induction are to be carried out in order to convey this point to onsite labourers (i.e. convey acceptable areas in which to traverse within the subject site).	**Low risk (Level 4)**	High
	Spatial Extent	Local				
	Duration	Medium				
	Consequence	Substantial				
	Probability	Likely				
	Reversibility	Low				
	Irreplaceability	Low				

The table below includes an assessment of the potential **direct impacts** for the **operational phase**.

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
DIRECT IMPACTS - OPERATIONAL PHASE						
Impact 14: Continued alteration of habitat structure and composition on account of continuing low level anthropogenic impacts, such as "shading of vegetation" from arrays	*Status*	**Neutral**	**Moderate risk (Level 3)**	▪ Ensure that the faunal components are retained and management of the facilities are ecologically driven. ▪ Implement other general management principles as per the EMPr.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 15: Ousting (and recruitment) of various fauna on account of long-term changes in the surrounding habitat/environment	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Exclusion areas should be maintained. Maintain scarp slopes and ensure that they are unimpeded by the proposed development. ▪ Avoid extensive alteration of sheet wash areas. ▪ Implement other general management principles as per the	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
	Reversibility	**Low**		EMPr.		
	Irreplaceability	**Low**				
Impact 16: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change	*Status*	**Negative**	**Low risk (Level 4)**	▪ Exclusion areas should be maintained. Maintain scarp slopes unimpeded by development. Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna. ▪ Implement other general management principles as per the EMPr.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 17: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities	*Status*	**Negative**	**Low risk (Level 4)**	▪ All vehicles that are stationary or parked at the construction site camp for longer than 30 days are to have a drip tray placed underneath the engine. ▪ A spill kit is to be placed onsite in order to limit any impact. ▪ Limit access to the riverine areas.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 18: Exotic weed invasion as a consequence of regular and continued disturbance of site	*Status*	**Negative**	**Low risk (Level 4)**	▪ Implementation of an alien invasive vegetation management plan.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **direct impacts** for the **decommissioning phase**.

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
DIRECT IMPACTS - DECOMMISSIONING PHASE						
Impact 19: A reversion to an early seral stage	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities. ▪ Manage stabilisation and reinstatement of the land.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 20: A reversion to present faunal population states within the study area, with some variation to these populations being possible	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities. ▪ Manage stabilisation and reinstatement of the land.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 21: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Cordon off access to dendritic drainage lines.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 22: Exotic weed invasion as a consequence of abandonment of site and cessation of weed control measures	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Post bi-yearly monitoring of the site to hinder proliferation of exotic species as a result of the development.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **indirect impacts** identified for the **operational phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
INDIRECT IMPACTS - OPERATIONAL PHASE						
Impact 23: Changes in the broader landscape ecology through alteration of eco-morphological drivers	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Appropriate management of the site must be undertaken along ecological integration approaches. ▪ Cordon off access to dendritic drainage lines.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 24: Changes in faunal ethos due to the establishment of the PV Facilities	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Implementation of security fencing is likely to arise.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **cumulative impacts** identified for the **construction and operational phases**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS – CONSTRUCTION AND OPERATIONAL PHASES						
Impact 25: Alteration of habitat structure and composition, albeit primarily sporadic in nature, over an extensive and wide area	*Status*	**Negative**	**Low risk (Level 4)**	• Ensure construction is limited to the approved development footprint. ▪ Clear vegetation only where necessary.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
Impact 26: Changes in fauna, faunal ethos and related factors	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Allow for permeability in fence line for greater ease of migration for fauna.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				
Impact 27: Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment	*Status*	**Negative**	**Low risk (Level 4)**	• Ensure storm water controls are adequately attenuate storm water runoff. ▪ Limit scour and erosion.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				
Impact 28: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment	*Status*	**Negative**	**Low risk (Level 4)**	• All vehicles that are stationary or parked at the construction site camp for longer than 30 days are to have a drip tray placed underneath the engine. • A spill kit is to be placed onsite in order to limit any impact. • Limit access to the riverine areas.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				
Impact 29: Exotic weed invasion as a consequence of regular and continued disturbance across an extensive area of site	*Status*	**Negative**	**Low risk (Level 4)**	▪ Co-ordinated and sustained management of all nine PV and EGI Projects associated with this BA.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				

D.2.5.5 Concluding Statement

The overall impact significance (with the implementation of mitigation measures) associated with the PV facilities is rated as moderate during the construction phase, and low during the operational and decommissioning phases for direct impacts. The same trend applies to the cumulative and indirect impacts.

Given the information presented above it is recommended that the proposed project permitted to proceed, and that it has a limited impact on the broader ecological processes and those areas deemed to be of ecological significance (namely the lower riparian environments and sand wash environments). Therefore, the proposed projects show a low level ecological impact within the sites identified and, subject to the implementation of the prescribed management recommendations and conditions, should not be precluded from development on ecological grounds.

D.2.6 Aquatic Biodiversity and Species

The Aquatic Biodiversity and Species Assessment was undertaken by Simon Bundy, Luke Maingard, and Alex Whitehead of Sustainable Development Projects cc to inform the outcome of this BA from an aquatic biodiversity and species perspective. The complete Aquatic Biodiversity and Species Assessment is included in Appendix C.5 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Aquatic Biodiversity and Species Assessment. The information below is extracted from Bundy *et. al.* (2020) (Appendix C.5 of the BA Report).

D.2.6.1 Approach and Methodology

The approach and methodology adopted in the Aquatic Biodiversity and Species Assessment is described in this section.

A biophysical reconnaissance and site evaluation of the assessed area was undertaken over a 5-day period in September 2020, during which specific primary data was collected and evaluated. In addition, the identification of key hydrological features on site and an interpretation of the prevailing flora and fauna, as well as other features was undertaken. The study also included a literature review of the region to confirm or corroborate findings. The literature review utilized various sources including the National Fresh Water Priority Areas (NFEPA), South African National Biodiversity Institute (SANBI) data and other relevant sources. In addition, recent and historical aerial imagery of the site was also reviewed in order to identify points for investigation during the field survey.

All data collected in the field and during the literature review was evaluated and interpreted in order to provide an understanding of the nature of the prevailing environment at a landscape and habitat level, together with specific evaluation of data relating to habitat form and structure. The evaluation also sought to identify any anomalies within the prevailing environment. Such variance may be considered to be indicative of differing habitat forms, which under consideration, may be of higher order ecological value in relation to the prevailing environment.

The following key approach was used for evaluating the study area on site:

- Key features, such as rivers and scarps, were evaluated in order to determine the key, geophysical features on the site;

- Sites of geomorphological or topographic variance were identified and subjected to an evaluation of species present within a 40 m linear extent across the selected site. Species were identified and collated according to a "presence – absence" method of evaluation;
- Additional random sample points were selected from across the site for comparative purposes; and
- Any additional species of significance not identified within the sample sites were also noted.

All data was collated and subject to evaluation in order to:

- Place the data into a hierarchy of similarities according to species composition and sample sites.
- Give consideration to the overall structure of habitat within the subject site.
- Identify any habitat anomalies that may be identified in such analysis.
- Allow for the interpretation of such data in order to prioritise and evaluate habitat form and structure within the study area.

In addition, the delineation of riparian edge and ephemeral wetland environments was undertaken utilizing accepted delineation techniques contained within "A Practical Field Procedure for Identification of Wetlands and Riparian Areas" (DWAF, 2005) and the updated guidelines (DWAF 2008). Such evaluations utilized geomorphological conditions, geohydromorphic edaphic conditions and botanical indicators in order to identify such components. Where riparian and wetland systems were identified these areas were subject to specific evaluation. During the delineation exercise, the riparian and wetland areas associated with the site were delineated using aerial photography and field observations, which focus primarily on changes in vegetation, topography and the presence of alluvial deposits. Specific points were marked using a Garmin VI Montana Global Positioning System (GPS) device, where necessary.

In terms of wetland functionality and health, the Wet-Eco Services Tool (Kotze et. al. 2007) was used to determine the significance of the three identified wetland environments or zones (i.e. permanent, seasonal and temporary). Being an arid environment, with little or intermittent flow arising only on occasion, a "desktop" Environmental Importance and Sensitivity (EIS) and Present Ecological State (PES) was undertaken (i.e. it was not possible to evaluate aquatic biota or undertake water chemistry analysis). This exercise involved the identification of the appropriate riverine section. The results of the PES or ecological status of the system provide an indication of the level of importance of the river, according to a ranking.

The method used for the EIS determination was adapted from the method as provided by the Department of Water Affairs (DWA) (1999) for floodplains. The method takes into consideration PES scores obtained for WET-Health as well as function and service provision to enable the assessor to determine the most representative EIS category for the wetland feature or group being assessed. A series of determinants for EIS are assessed on a scale of 0 to 4, where 0 indicates no importance and 4 indicates very high importance.

D.2.6.2 Relevant Project Aspects relating to Aquatic Biodiversity and Species Impacts

The development of a PV facility and associated infrastructure within the study area will by necessity, be undertaken on land that meets a number of criteria including, inter-alia, level or gradual falls, generally suitable founding conditions and avoidance of areas that may be inundated by flooding. As a consequence, the proposed PV facilities will avoid all riverine and wetland environments. The proposed projects will alter the nature of the immediate catchment associated with such riverine

environments through both the construction and operational phases. Such change will arise primarily from changes in the rate of flow of surface water and possible alteration of the edaphics or soils within the facility, as well as, to a minor extent, water chemistry and perhaps, more indirectly, the biotic components of the riverine system.

The proposed projects will see a land use change that differs significantly from the prevailing land use. The implementation of the proposed development will result in notable change to the prevailing catchment associated with the river systems in the area, primarily on account of the construction stage of the project, as well as the long-term operational stage. Indirect impacts may therefore arise on riverine systems as a consequence of changes in the catchment.

The commencement of construction on site will entail low to significant alteration of the prevailing habitat, depending upon the final design and layout of the PV facilities. A general sequestering of the study area, through the fencing of the site from the surrounding habitat forms will thus arise. While the construction phase will see temporary disturbances and transformation to the environment, these impacts on the prevailing ecology are likely to be significant in terms of impact, but of short temporal extent, as the construction project rolls out and a stability, albeit within a differing environment, arises on the site.

D.2.6.3 Potential Impacts

A number of direct, indirect and cumulative impacts on the localised and broader ecology of the region can be identified as a consequence of the implementation of the proposed project. Direct impacts are those that are directly attributable to the implementation and operation of the project, while indirect impacts are consequential effects of the proposed project that may not be directly attributable to the development. Cumulative impacts are those externalities that arise from the proposed development and compound existing effects or influences on the ecology of the region. These impacts occur during the construction, operational and decommissioning phases, as relevant, and are listed below.

Construction Phase:

- Potential Impact 1: Changes in the geomorphological state of drainage patterns due to construction activities leading to change in the eco-morphology of lower lying areas and those immediately adjacent to it.
- Potential Impact 2: Increased electrical light pollution, leading to changes in nocturnal behavioral patterns of fauna.
- Potential Impact 3: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) as a result of construction activities.

Operational Phase:

- Potential Impact 4: Changes in the geomorphological state of drainage lines on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change.
- Potential Impact 5: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities. Such changes will be related to the long-term activities on site, but are likely to be negligible.

Decommissioning Phase:

Such alterations and changes will be dependent upon the expectant post-decommissioning land use and operation cease of the PV Facilities and associated infrastructure. However, abandonment of the site would probably result in:

- Potential Impact 6: A reversion of present faunal population states within the study area, with some variation to these populations being possible.
- Potential Impact 7: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment.

Indirect Impacts:

- Potential Impact 8: Changes in the broader landscape ecology through alteration of eco-morphological drivers.
- Potential Impact 9: Changes in faunal ethos as a result of the establishment of the PV facilities and associated infrastructure.

Cumulative Impacts:

The cumulative assessment considers all nine proposed PV plants and nine power lines as part of this suite of developments (referred to as the Ceres PV Development) and 11 other renewable energy projects that have received EA within 30 km of the subject site. The cumulative impact assessment also considers other proposed, approved and existing power lines within the 30 km radius.

Given the above, cumulative impacts arising from the implementation of this project and other land use changes in the region are likely to exhibit the following:

- Potential Impact 10: Increased change in the geomorphological state of drainage lines and watercourses on account of long term and extensive change in the nature of the catchment.
- Potential Impact 11: Changes in water resources and surface water in terms of water quality (i.e. impact on water chemistry) on account of extensive changes in the catchment.

D.2.6.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the **construction phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Impact 1: Changes in the geomorphological state of drainage patterns	*Status*	**Negative**	**High risk (Level 2)**	▪ Exclusion areas should be maintained. Maintain scarp slopes unimpeded by development. Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna. ▪ Implement other general management principles as per the EMPr.	**Moderate risk (Level 3)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Severe**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 2: Increased ELP	*Status*	**Negative**	**Low risk (Level 4)**	▪ Ensure reduced security lighting, downward lighting and restriction on lumens employed.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 3: Changes in water resources and surface water in terms of water quality	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Provide adequate storm water controls to ensure attenuation of storm water runoff emanating from the PV panels and other hard panned surfaces.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **direct impacts** identified for the **operational phase**.

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
DIRECT IMPACTS - OPERATIONAL PHASE						
Impact 4: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change	*Status*	**Negative**	**Low risk (Level 4)**	▪ Exclusion areas should be maintained. Maintain scarp slopes unimpeded by development. Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna. ▪ Implement other general management principles as per the EMPr.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 5: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities	*Status*	**Negative**	**Low risk (Level 4)**	▪ Provide adequate storm water controls to ensure attenuation of storm water runoff emanating from the PV panels and other hard panned surfaces. ▪ Implement proper spill control and management, such as the retention of emergency spill kits on site.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **direct impacts** identified for the **decommissioning phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - DECOMMISSIONING PHASE						
Impact 6: A reversion to present faunal population states within the study area, with some variation to these populations being possible	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities. ▪ Manage stabilisation and reinstatement of the land.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				
Impact 7: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Provide adequate storm water controls to ensure attenuation of storm water runoff emanating from the PV panels and other hard panned surfaces.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **indirect impacts** identified for the **construction and operational phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
INDIRECT IMPACTS – CONSTRUCTION AND OPERATIONAL PHASE						
Impact 8: Changes in the broader landscape ecology through alteration of eco-morphological drivers	*Status*	**Negative**	**Low risk (Level 4)**	▪ Appropriate management of the site must be undertaken along ecological integration approaches.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
	Irreplaceability	**Low**				
Impact 9: Changes in faunal ethos due to the establishment of the PV Facilities	*Status*	**Negative**	**Low risk (Level 4)**	▪ Exclusion areas should be maintained. Maintain scarp slopes and ensure that they are unimpeded by the proposed development. Mitigation of this impact would result in a low rating.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

The table below includes an assessment of the potential **cumulative impacts** identified for the **construction and operational phases**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS – CONSTRUCTION AND OPERATIONAL PHASES						
Impact 10: Increased change in the geomorphological state of drainage lines and watercourses, on account of long term and extensive change in the nature of the catchment	*Status*	**Negative**	**Low risk (Level 4)**	▪ Cordoning off the sites to prevent inward migration of fauna as well the implementation of other general management principles as per the EMPr.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				
Impact 11: Changes in water resources and surface water in terms of water quality on account of extensive changes in the catchment.	*Status*	**Negative**	**Low risk (Level 4)**	▪ Co-ordinated and sustained management of all nine PV and EGI Projects associated with this BA.	**Low risk (Level 4)**	High
	Spatial Extent	**Regional**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				
	Irreplaceability	**Low**				

D.2.6.5 Concluding Statement

The overall impact significance (with the implementation of mitigation measures) associated with the EGI and associated infrastructure is rated as low during the construction phase, operational and decommissioning phases for direct impacts. The same trend applies to the cumulative and indirect impacts.

Given the information presented above it is recommended that the proposed projects are is permitted to proceed, and that it has a limited impact on the broader ecological processes and those areas deemed to be of ecological significance (namely the lower riparian environments and sand wash environments). Therefore, the proposed projects show a low level aquatic ecological impact on adjacent riparian environments and, subject to the implementation of the prescribed management recommendations and conditions, should not be precluded from development on ecological grounds.

D.2.7 Riverine Rabbit Assessment

As noted above, the Riverine Rabbit Assessment was undertaken by Simon Todd of 3Foxes Biodiversity Solutions to inform the outcome of this BA from a faunal perspective, with particular reference to Riverine Rabbit, *Bunolagus monticularis*. The complete Riverine Rabbit Assessment is included in Appendix F of the Terrestrial Biodiversity and Species Assessment, which is included as Appendix C.4 of the BA Report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Riverine Rabbit Assessment. The information below is extracted from Todd (2020).

D.2.7.1 Approach and Methodology

The objectives of the Riverine Rabbit Assessment were to:

- Conduct a field assessment to evaluate the Riverine Rabbit habitat suitability of the site.
- Conduct a camera trapping campaign at the site to evaluate the presence of the Riverine Rabbit.
- Provide a Riverine Rabbit sensitivity map for the affected area with any associated buffers and development constraints.
- Provide an assessment of the impact of the development on the Riverine Rabbit with associated mitigation and avoidance measures.

As noted in Section B of this BA Report, camera trapping was used across the site to establish the presence or absence of the Riverine Rabbit and to characterise the fauna of the site more generally. A total of 30 camera traps were distributed across the site for a 6-week period over September 2020 and October 2020. Due to the association of Riverine Rabbits with riparian floodplain habitats, camera traps were concentrated within riparian areas identified as potential habitat for this species. This amounted to approximately two-thirds of the cameras in riparian areas and the remainder were located in other habitats. In order to increase the number of fauna captured, the cameras were placed along paths, fences etc. where fauna are likely to pass and be captured by the cameras.

Before going to the field, the different habitats present at the site were mapped from satellite imagery. This allowed the identification of the riparian areas and other areas where Riverine Rabbits are more likely to be present and also aid in camera trap placement. In the field, these different areas were assessed based on plant species composition and substrate conditions for habitat suitability in order to inform the sensitivity classification of these different areas.

A Riverine Rabbit sensitivity map of the site was thereafter produced by integrating the results of the field assessment and camera trapping results. The sensitivity of the mapped units was rated according to the scale as indicated below, which is discussed more at the end of this section of the BA Report:

- Low – Areas outside of riparian habitats where it is considered highly unlikely that the Riverine Rabbit is present or uses these areas on a regular basis. Development can proceed within these areas with little impact on the Riverine Rabbit.
- Medium - Areas where it is considered unlikely but possible that the Riverine Rabbit is present. These are areas of sub-optimal habitat where it is considered unlikely that there are any resident Riverine Rabbits present, although it is possible that rabbits move through this area occasionally. Some development in these areas is considered acceptable.
- High – Riparian areas where it is considered potentially likely that Riverine Rabbits are present. These are not areas of optimal habitat, but rather smaller drainage lines where the extent of suitable habitat and presence of food plants is limited. These areas are likely important for connectivity and it is likely that Riverine Rabbit utilise these areas when traversing the landscape.
- Very High – Riparian areas considered to represent optimal or near-optimal areas of habitat where the probability of Riverine Rabbit presence is high. However, even if no rabbits are located in these areas through camera trapping, they are considered essential for connectivity and as potential habitat. These areas are usually no-go areas from a developmental perspective and should be avoided as much as possible. It is however acceptable for access roads and power lines to traverse these areas where necessary.

D.2.7.2 Relevant Project Aspects relating to Riverine Rabbits Impacts

The assessed layout of the PV development sites has been informed by the Riverine Rabbit Assessment and the mapping of Riverine Rabbit sensitivity as well as the other environmental constraints present at the site.

D.2.7.3 Potential Impacts

The following impacts were identified:

- ***Construction Phase Impact 1: Direct and Indirect Impacts on Riverine Rabbits***

The construction of access roads, PV fields etc. will result in the destruction of currently intact vegetation, possibly leading to habitat loss and fragmentation. The large amount of traffic during construction will increase the probability of vehicle-related mortality. This would potentially be within the site as well as on the larger public roads to the site such as the R356. Roadkill is a significant source of mortality for Riverine Rabbits. As the public roads to the site go through several areas of potential habitat, the increase in traffic associated with construction could increase the probability of roadkill. As Riverine Rabbit activity is highest between dusk and dawn, traffic during these hours can be curtailed. In addition, speed limits in areas of potential conflict can be implemented as this reduces collision risk. In addition, construction activity will result in noise and disturbance which may deter Riverine Rabbits from the affected areas. These impacts would however be transient and restricted to the construction phase, with significantly lower levels of traffic and disturbance during the operational phase. The primary area of potential conflict in terms of habitat loss would be the areas of potential Riverine Rabbit habitat along the drainage lines of the site. As the drainage lines and floodplains have been mapped as Very High sensitivity, no PV fields would be located in these areas and the total

development footprint in these areas would be low. As a result, the total potential extent of habitat loss is likely to be very low and the resulting impact from habitat loss would also be low.

Without mitigation this impact is likely to be of Moderate significance. With the implementation of the suggested mitigation the construction phase impact on Riverine Rabbits can likely be reduced to a Low Significance. The mitigation measures are highlighted in the tables below.

- ***Operational Phase Impact 1: Impacts on Riverine Rabbits during operation***

The operational phase would entail significantly lower levels of disturbance than the construction phase. However, there would still be increased traffic to and from the site each day leading to increased collision risk as well as some noise and disturbance associated with the operation and maintenance of the PV facilities which would have a negative influence on any resident Riverine Rabbits. The noise and disturbance would however be of a relatively low intensity and would have a largely local impact only. Without mitigation this impact is likely to be of Low significance. With the implementation of the suggested mitigation the operational phase impact on Riverine Rabbits would remain at a Low significance. The mitigation measures are highlighted in the tables below.

- ***Cumulative Impact 1: Cumulative Impacts on Broad-Scale Ecological Processes as related to the Riverine Rabbit***

The development would result in cumulative impacts on broad-scale ecological processes such as movement and migration of Riverine Rabbits. The current proposed development would add approximately 2270 ha to the existing level of potential impact associated with approved PV and wind energy projects. This is a locally significant contribution and rivals the entire footprint of all approved projects within 30km of the site. However, it is important to note that with regards to Riverine Rabbit habitat, the loss associated with the current proposed projects would be very low and the proposed projects would be unlikely to generate significant habitat fragmentation for the Riverine Rabbit given the avoidance of the preferred habitat areas. Without mitigation this impact is likely to be of Moderate significance. With the implementation of the suggested mitigation the cumulative impact on Riverine Rabbits can likely be reduced to a Low significance. The mitigation measures are highlighted in the tables below.

Specifically, in terms of power lines, the study confirmed that the power line would not generate a significant extent of habitat loss within the riparian areas and a significant impact from the power line would not occur.

D.2.7.4 Impact Assessment

The table below includes an assessment of the potential **direct and indirect impacts** identified for the **construction phase** in relation to Riverine Rabbits.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT AND INDIRECT IMPACTS - CONSTRUCTION PHASE						
Impact on Riverine Rabbits due to construction phase activities (i.e. Habitat loss and disturbance)	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Adhere to the development restrictions placed on areas of High and Very High sensitivity. Any roads and power lines through these areas should use existing footprint areas where possible. **Note that the Riverine Rabbit Assessment also explains that it is however acceptable for access roads and power lines to traverse these areas where necessary.** ▪ All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h. ▪ Limiting access to the site and ensuring that construction staff and machinery remain within the demarcated construction areas during the construction phase. ▪ Environmental induction for all staff and contractors on-site must be undertaken. ▪ The design should ensure that there is no electrical fencing around the PV fields or substations (and associated battery facility) or other infrastructure that are within 20 cm of the ground as some fauna can become stuck against such fences and are electrocuted to death.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long-term**				
	Consequence	**Substantial**				
	Probability	**Very Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Moderate**				
DIRECT IMPACTS - OPERATIONAL PHASE						
Impact on Riverine Rabbits due to operational phase activities (i.e. Disturbance and vehicle collisions)	*Status*	**Negative**	**Low risk (Level 4)**	▪ Human activity and disturbance outside of the fenced PV areas should be kept to a minimum and restricted to required maintenance activities only. ▪ All vehicles should adhere to a low speed limit on-site. Heavy vehicles should be restricted to 30km/h and light vehicles to 40km/h.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long-term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Moderate**				

The table below includes an assessment of the potential **cumulative impacts** identified for the **operational phase** in relation to Riverine Rabbits.

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
CUMULATIVE IMPACTS - OPERATIONAL PHASE						
Cumulative Impacts on Broad-Scale Ecological Processes as related to the Riverine Rabbit (Disturbance and vehicle collisions)	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Adhere to the sensitivity maps provided within this assessment when determining the final layout of the PV facilities and associated infrastructure. ▪ Ensure that all the operational phase management plans are fully implemented and that the associated monitoring and feedback mechanisms to management are in place.	**Low risk (Level 4)**	**High**
	Spatial Extent	**Local**				
	Duration	**Long-term**				
	Consequence	**Substantial**				
	Probability	**Very Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Moderate**				

D.2.7.5 Concluding Statement

The camera trapping did not capture any images of Riverine Rabbits, suggesting at the very least that this species is not common in the area. The cameras did however pick up almost 600 images of Cape Hare, indicating that this is the dominant lagomorph of the area. Since these two species rarely co-occur at any individual camera trapping station, this suggests that Riverine Rabbits are not present at least within the areas sampled by the camera traps. It is possible that Riverine Rabbits are present along the major drainage lines of the site and were simply not picked by the camera traps. However, even if this is the case, there has been sufficient avoidance of this habitat that even if all 9 PV facilities and power lines were to be built that impact on Riverine Rabbit would likely remain low.

Based on the field assessment and assessed layout, the development would not generate significant impact on the Riverine Rabbit and with the provided buffers around the important habitat features, the loss of habitat and impacts on landscape connectivity for Rabbits would be low.

The grid connection route to the Kappa substation would generate a low impact on Riverine Rabbit habitat and no significant impacts on Riverine Rabbits are expected to occur as a result of the grid connection. Overall, there are no fatal flaws associated with any of the grid connections and it can be supported in terms of generating acceptably low Riverine Rabbit impacts. Overall, there are no fatal flaws associated with any of the proposed PV facilities and it can be supported in terms of generating acceptably low Riverine Rabbit impacts.

D.2.8 Avifauna Impact Assessment

The Avifauna Impact Assessment was undertaken by Chris van Rooyen and Albert Froneman of Chris van Rooyen Consulting to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessment is included in Appendix C.6 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Avifauna Impact Assessment. The information below is extracted from van Rooyen and Froneman (2020) (Appendix C.6 of the BA Report).

D.2.8.1 Approach and Methodology

The Avifauna Impact Assessment (Appendix C.6 of the BA Report) includes a description of the affected environment from an avifaunal perspective, mapping of the sensitivity of the site in terms of avifaunal features such as habitat use, roosting, feeding and nesting / breeding, feedback of the sensitivity in terms of the Screening Tool, an assessment of the potential impacts of the proposed development on avifauna including cumulative impacts, and recommendations for sufficient mitigation measures. The study considered various desktop information sources and data to source information on the impacts of solar facilities on avifauna; as well as on-site surveys which were conducted from 25 – 27 August 2020 (Survey 1) and 16 – 19 September 2020 (Survey 2) according to the best practice guidelines for avifaunal impact studies for solar developments, compiled by BirdLife South Africa (BLSA) in 2017 (Jenkins et al. 2017).

D.2.8.2 Relevant Project Aspects relating to Avifaunal Impacts

Components of the proposed project that are relevant in terms of avifauna are those typically associated with such developments, with a specific focus on overhead power lines.

D.2.8.3 Potential Impacts

The potential impacts identified in the Avifauna Impact Assessment include collisions with the 132 kV grid connections during the operational phase. This is rated as a direct and cumulative impact. No indirect impacts were identified.

D.2.8.4 Impact Assessment

The table below includes an assessment of the potential **direct and cumulative impacts** for the operational phase.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - OPERATIONAL PHASE						
Collision mortality of priority species due to the 132 kV grid connections	*Status*	**Negative**	**High risk (Level 2)**	▪ The avifaunal specialist must conduct a walk-through prior to implementation to demarcate sections of the power line that need to be marked with Eskom approved bird flight diverters. ▪ The bird flight diverters should be installed on the full span length on the earth wire (according to Eskom guidelines – 5 m apart). ▪ Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. ▪ These devices must be installed as soon as the conductors are strung.	**Moderate risk (Level 3)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Severe**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
CUMULATIVE IMPACTS – OPERATIONAL PHASE						
Collision mortality of priority species due to the 132 kV grid connections	*Status*	**Negative**	**High risk (Level 2)**	▪ The avifaunal specialist must conduct a walk-through prior to implementation to demarcate sections of the power line that need to be marked with Eskom approved bird flight diverters. ▪ The bird flight diverters should be installed on the full span length on the earth wire (according to Eskom guidelines – 5 m apart). ▪ Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds respectively. ▪ These devices must be installed as soon as the conductors are strung.	**Moderate risk (Level 3)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Severe**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

D.2.8.5 Concluding Statement

The expected impacts of the proposed projects were overall rated to be of Moderate significance and negative status pre-mitigation. However, with appropriate mitigation, the post-mitigation significance of all the identified impacts should be reduced to Low negative. It is therefore recommended that the activity is authorised, on condition that the proposed mitigation measures as detailed above and in the EMPr (Appendix G and Appendix H of this BA Report) are strictly implemented.

D.2.9 Socio-Economic Assessment

The Socio-Economic Assessment was undertaken by Sandra Hill to inform the outcome of this BA from a socio-economic perspective. The complete Socio-Economic Assessment is included in Appendix C.7 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Socio-Economic Assessment. The information below is extracted from Hill (2020) (Appendix C.7 of the BA Report).

D.2.9.1 Approach and Methodology

The Socio-Economic Assessment includes the individual land parcels on which the proposed projects will be developed if approved, the surrounding area, known as the Ceres Karoo (of which the land parcels are a part of), and the nearest towns, Touws River and Ceres, as the anticipated socio-economic impacts will be spread to varying degrees across these localities. While Touws River falls within the Breede Valley Local Municipality, the project sites and Ceres fall within the Witzenberg Local Municipality. The Guideline for Social Impact Assessment (Barbour, 2007) was used to provide policy and quality control guidelines for the Socio-Economic Assessment process followed. To create a comprehensive understanding of the socio-economic environment that might be affected by the proposed development, a socio-economic overview was developed incorporating both secondary and primary data collection. Data sources consulted to compile the socio-economic baseline include internet sources, for example, Statistics South Africa, to provide a broad overview of the socio-economic setting of the area; National, provincial and local policy and plans to determine whether the proposed project is aligned with the planning objectives of the various spheres of government, as well as previously conducted EIAs conducted to determine the potential impact and linkages to this assessment. Primary data collection was done through face-to-face and/or telephonic interviews with land owners of the affected properties, municipal officials and community role-players to obtain additional context-specific information. A site visit was undertaken on 7 September 2020 to the affected project farms, Touws River, and Ceres.

Data analysis was then conducted by evaluating relevant data from various sources published over different time periods in order to gain a long-term perspective. Information was analysed to establish status quo socio-economic conditions, prevailing social structures, local demographic trends, and potential change processes present in the study area. The overview was then used to interpret the impacts and measure the extent of socio-economic impacts that could be derived from the proposed activities.

D.2.9.2 Relevant Project Aspects relating to Socio-Economic Impacts

From a socio-economic perspective, the most important project related aspects are employment creation over the lifetime of the project; and the Economic Development Plan (EDP) the Applicant is to develop for implementation should the projects obtain preferred bidder status in terms of the REIPPPP.

D.2.9.3 Potential Impacts

The potential impacts identified for the Socio-Economic Assessment include:

Construction Phase:
- Potential impact 1: Disruption of local social structures
- Potential impact 2: Increased social ills and risky behaviours
- Potential impact 3: Increased burden on existing social and bulk services
- Potential impact 4: Increased road use and road traffic related accidents and/or damage
- Potential impact 5: Loss of privacy, safety and sense of place adjacent to the project site
- Potential impact 6: Unrealistic expectations regarding local job creation
- Potential impact 7: Creation of temporary employment
- Potential impact 8: Increased household income attainment and standard of living
- Potential impact 9: Potential increase in crime
- Potential impact 10: Potential decrease in local eco-tourism
- Potential impact 11: Potential marginalisation of local residents
- Potential impact 12: Development and/or growth of locally-owned support industries

Operational Phase:
- Potential impact 1: Creation of long-term employment
- Potential impact 2: Development and/or growth of locally-owned industries
- Potential impact 3: Human development via the EDP

Decommissioning Phase:
- Potential impact 1: Job losses
- Potential impact 2: Local economy stimulation

Cumulative Impacts:
- Cumulative impact 1: Exacerbated in-migration of job seekers
- Cumulative impact 2: Combined impact of multiple EDPs

No indirect impacts were identified.

D.2.9.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the construction, operational and decommissioning phases.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Impact 1: Disruption of local social structures	*Status*	**Negative**	**Low risk (Level 4)**	▪ The developer should make every effort to ensure the majority of construction workers are de facto residents of the Ceres Karoo, Touws River and/or Ceres region. ▪ Where possible, subcontract to local construction companies from this region.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Medium term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**Moderate**				
Impact 2: Increased social ills and risky behaviours	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ The developer should make every effort to ensure the majority of construction workers are de facto residents of Ceres Karoo, Touws River and/or Ceres region. ▪ Where possible, subcontract to local construction companies from this region. ▪ The developers should be mindful of and regularly engage with landowners, farm residents and with Touws River and/or Ceres local communities. The former can be achieved through liaison with the Ceres-Tankwa Karoo Farmers Association. The latter can be achieved in collaboration with local community organisations. ▪ The developer should develop and clearly communicate a Code of Conduct for all employees related to the project, which includes zero tolerance of activities such as violence, alcohol and drug abuse.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Medium term**				
	Consequence	**Substantial**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation and Pre-Enhancement)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation and Post-Enhancement)***	***Confidence Level***
	Probability	**Likely**		▪ Introduce weekly randomized alcohol and drug testing for all employees related to the project. ▪ Make condoms freely available to all employees related to the project. ▪ No construction workers should be allowed to sleep at the construction site. ▪ All COVID regulations and safety precautions in force at the time of construction, operation and decommissioning must be communicated to workforce, enforced and upheld by the developer. ▪ The construction workforce should receive COVID-19 and HIV awareness training prior to the commencement of construction. ▪ HIV and TB testing and counselling should be made available to the construction workforce free of charge. ▪ Local HIV infection rates/ARV treatment loads must be monitored annually through close interaction with the local clinic. Should infections and treatment loads increase at a rate greater than the anticipated rate of increase; the developers (or the appointed agent) must re-evaluate its HIV awareness training, take corrective action where necessary, and repeat said training.		
	Reversibility	**Low**				
	Irreplaceability	**N/A**				
Impact 3: Increased burden on existing social and bulk services	*Status*	**Negative**	**Low risk (Level 4)**	▪ It is strongly suggested that a 'locals first' policy with regard to labour needs is implemented. The developer should make every effort to ensure the majority of construction workers are de facto residents of the Ceres Karoo, Touws River and/or Ceres region. ▪ Where possible, subcontract to local construction companies from this region.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Short to medium term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Moderate**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation and Pre-Enhancement)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation and Post-Enhancement)***	***Confidence Level***
	Irreplaceability	**N/A**				
Impact 4: Increased road use and road traffic related accidents and/or damage	*Status*	**Negative**	**Low risk (Level 4)**	▪ Traffic expert should be consulted, post Environmental Authorisation and prior to construction, and a road and traffic management plan devised and implemented to mitigate potential negative consequences of increased road use during and construction.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Short to medium term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 5: Loss of privacy, safety and sense of place adjacent project site	*Status*	**Negative**	**Low risk (Level 4)**	▪ No construction workers should be allowed to sleep at the construction sites. ▪ A maximum 60 km/h speed limit should be enforced on private roads.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 6: Unrealistic expectations regarding local job creation	*Status*	**Negative**	**Low risk (Level 4)**	▪ It is strongly suggested that a 'locals first' policy with regard to labour needs is implemented. The developer should make every effort to ensure the majority of construction workers are de facto residents of the Ceres Karoo, Touws River and/or Ceres region. ▪ The developer must engage the local communities in the study area on the nature, duration, number and availability of employment opportunities well in advance of any construction activities taking place. It is recommended that existing social structures be utilised for such interaction, and that the process be commenced once environmental authorisations has been granted. ▪ The developer should establish employment desks in the Ceres Karoo, Touws River and/or Ceres to facilitate employment-related queries, and maintain a register of applicants which reflects their respective expertise, skill level and contact/residential details. Whenever planned or ad hoc employment is considered, the	**Very low risk (Level 5)**	Medium
	Spatial Extent	**Local**				
	Duration	**Medium to long term**				
	Consequence	**Moderate**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
	Probability	**Likely**		register should be consulted to identify appropriately qualified candidates. ▪ Employment procedures should not preclude the educationally and resource poor. As discussed in this report, education and skill level within the study area is low, and access to resources such as computers and printers is negligible, particularly in the Ceres Karoo. ▪ The existence of the employment desk, and the relevant procedures associated with the selection and appointment of workers must be communicated to the local communities. ▪ Where possible, the developer should subcontract to local construction companies from this region.		
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 7: Creation of temporary employment	*Status*	**Positive**	**Moderate risk (Level 3)**	▪ The developer should make every effort to ensure the majority of construction workers are de facto residents of the Ceres Karoo, Touws River and/or Ceres region. ▪ Where possible, the developer should subcontract to local construction companies from this region. ▪ The developer should comply with the EEA and make every effort to ensure equal access to employment, taking the demographics of the area into account. ▪ The developer should establish local employment desks in the Ceres Karoo, Touws River and/or Ceres to facilitate employment-related queries, and maintain a register of applicants which reflects their respective expertise, skill level and contact/residential details. ▪ Whenever planned or ad hoc employment is considered, the register should be consulted to identify appropriately qualified candidates. ▪ Employment opportunities and the existence of the employment desk must be communicated to the local communities in the Ceres Karoo, Touws River and/or Ceres region. ▪ The developer should offer debt education workshops for all project related employees.	**Moderate risk (Level 3)**	Medium
	Spatial Extent	**Local and Regional**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Very likely**				
	Reversibility	**High**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
	Irreplaceability	**N/A**		▪ The developer is encouraged to provide on-the-job training and additional training programs to improve the chances of skills development during the construction phase.		
Impact 8: Increased household income attainment and standard of living	*Status*	**Positive**	**Moderate risk (Level 3)**	▪ The developer should make every effort to ensure the majority of construction workers are de facto residents of the region of Ceres Karoo, Touws River and/or Ceres local communities. ▪ Employment opportunities and the existence of the employment desk must be communicated to the local communities in Ceres Karoo, Touws River and/or Ceres region.	**Moderate risk (Level 3)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Very likely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 9: Potential increase in crime	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Access to the project site should be controlled with only authorised staff permitted entry. ▪ Movement to and from the project site should be controlled where construction workers are transported to and from the pick-up area and project site by the developer or the appointed agent only. ▪ The developer must participate in a local safety forum and/or community watch, where such a forum exists, to address any concerns related to possible crime escalation. ▪ The developer must contribute to the costs of erecting and managing security cameras, and/or a repeater to help improve crime prevention and management in the area.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Medium**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 10: Potential decrease in local tourism	*Status*	**Negative**	**Low risk (Level 4)**	▪ The developer should make use of local eco-tourism services and product providers where possible. ▪ The developer should provide consultants, contractors and other skilled project related staff with a list of local eco-tourism services and product providers with a clear request to support local eco-tourism, where possible.	**Very low risk (Level 5)**	Medium
	Spatial Extent	**local**				
	Duration	**Short to medium term**				
	Consequence	**Moderate**				
	Probability	**Likely**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 11: Potential marginalisation of local residents	*Status*	**Negative**	**Low risk (Level 4)**	▪ The developer should consider appointing a community liaison person tasked with establishing and maintaining effective communication with local residents and/or their representatives.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Permanent**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**Low**				
	Irreplaceability	**N/A**				
Impact 12: Development and/or growth of locally-owned industries	*Status*	**Positive**	**Low risk (Level 4)**	▪ The developer should make use of local service and goods providers where possible. ▪ The developer should provide consultants, contractors and other skilled project related staff with a list of local service and goods providers with a clear request to support local businesses where such services are required.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
DIRECT IMPACTS – OPERATIONAL PHASE						
Impact 1: Creation of long-term employm	*Status*	**Positive**	**Very low risk (Level 5)**	▪ The developer should make every effort to ensure the majority of unskilled workers employed during this phase are de facto residents of the Ceres Karoo, Touws River and/or Ceres region. ▪ Employment opportunities and the existence of the employment	**Very low risk (Level 5)**	Medium
	Spatial Extent	**Local and Regional**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
	Duration	**Long term**		desks must be communicated to the local communities in the Ceres Karoo, Touws River and/or Ceres region. ▪ The employment desk registers compiled during construction phase should be consulted to identify appropriately qualified candidates. ▪ The developer must comply with the EEA and make every effort to ensure equal access to employment, taking the demographics of the area into account. ▪ Contracts ensuring that knowledge sharing and on-the-job training should be enforced as a condition for the development of the project.		
	Consequence	**Slight**				
	Probability	**Very unlikely**				
	Reversibility	**High**				
	Irreplaceability	**N/A**				
Impact 2: Development and/or growth of locally-owned industries	*Status*	**Positive**	**Very low risk (Level 5)**	▪ The developer should procure goods and services locally where possible. ▪ The developer should provide consultants, contractors and other project related staff with a list of local service providers with a clear request to support local businesses where such services are required.	**Very low risk (Level 5)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Slight**				
	Probability	**Very unlikely**				
	Reversibility	**N/A**				
	Irreplaceability	**N/A**				
Impact 3: Human development via the EDP	*Status*	**Positive**	**Moderate (Level 3)**	▪ The EDP to be developed for the project must be prepared by community development practitioners, to ensure that it can be effectively implemented and managed, bringing maximum benefit to the community. A third-party approach (as discussed in section 4.3 of the Socio-Economic Assessment) is recommended ▪ The developer or the appointed development practitioner must engage with local communities, through inter alia religious organisations, organised agriculture, NGOs, CBOs and local	**High (Level 2)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Likely**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation and Pre-Enhancement)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation and Post-Enhancement)*	*Confidence Level*
	Reversibility	**Moderate**		government structures within the Ceres Karoo, and if necessary, with those within Ceres and/or Touws River to identify and agree upon priorities which must then be included in the EDP. ▪ While the EDP need not focus exclusively on the Ceres Karoo, it must ensure it contributes to the developmental needs and priorities within this area, where this is possible in terms of the legal requirements of the REIPPPP. ▪ Where possible, the EDP should align with the IDPs of the relevant Local Municipalities.		
	Irreplaceability	**N/A**				
DIRECT IMPACTS – DECOMMISSIONING PHASE						
Impact 1: Job losses	*Status*	**Negative**	**Low risk (Level 4)**	▪ The developer should comply with relevant South African labour legislation when retrenching employees. ▪ The developer should implement appropriate succession training of locally employed staff earmarked for retrenchment during decommissioning.	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				
	Reversibility	**N/A**				
	Irreplaceability	**N/A**				
Impact 2: Local economy stimulation	*Status*	**Positive**	**Low risk (Level 4)**	▪ None	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Short term**				
	Consequence	**Moderate**				
	Probability	**Very likely**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation and Pre-Enhancement)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation and Post-Enhancement)***	***Confidence Level***
	Reversibility	**N/A**				
	Irreplaceability	**N/A**				

The table below includes an assessment of the potential **cumulative impacts** identified for the construction phase.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS – CONSTRUCTION AND OPERATIONAL PHASE						
Impact 1: Exacerbated in-migration of job seekers	*Status*	**Negative**	**Low risk (Level 4)**	▪ None	**Low risk (Level 4)**	Medium
	Spatial Extent	**Local**				
	Duration	**Medium to long term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**N/A**				
	Irreplaceability	**N/A**				
Impact 2: Combined human development caused by multiple EDPs being implemented	*Status*	**Positive**	**Moderate risk (Level 3)**	▪ None	**Moderate risk (Level 3)**	Medium
	Spatial Extent	**Local**				
	Duration	**Long term**				
	Consequence	**Substantial**				
	Probability	**Likely**				
	Reversibility	**N/A**				
	Irreplaceability	**N/A**				

D.2.9.5 Concluding Statement

The overall significance rating of the negative socio-economic impacts associated with the proposed project during the construction phase is very low to low; whereas the overall significance rating of the positive socio-economic associated with the proposed project during construction is low to moderate, should mitigation and enhancement measures be implemented respectively.

The overall significance rating of the positive socio-economic impacts associated with the proposed projects during the operation phase is very low to high, should enhancement measures be implemented.

The overall significance rating of the socio-economic impacts associated with the proposed projects during decommissioning phase is low (negative) and low (positive) should mitigation measures and enhancement measures be implemented, respectively.

The cumulative impact during the construction and operational phases is low (negative) to moderate (positive). There is no cumulative impact of the decommissioning phase.

Based on the above, it should be accepted that the development of the proposed projects is likely to result in some form of negative social impact to the local community. However, such a negative impact needs to be weighed against the potential benefit likely to result from the same development. Given the overall very low to low significance of potential negative impacts associated with the project, as compared to the overall very low to high significance of potential positive impact of the project; it can be concluded that the prospective socio-economic benefits of the proposed project outweigh the socio-economic losses/impacts.

From a socio-economic impact perspective, in light of the above argument, the Socio-Economic specialist conducting the assessment is of the opinion that the proposed projects should be authorised by the competent authority.

D.2.10 Geohydrology Assessment

The Geohydrology Assessment was undertaken by Charl Muller and Julian Conrad of GEOSS South Africa (PTY) Ltd to inform the outcome of this BA from a geohydrological perspective. The complete Geohydrology Assessment is included in Appendix C.8 of this report. The following section provides a summary of the Approach, Key Findings, Impact Assessment and Concluding Statement undertaken for the Geohydrology Assessment. The information below is extracted from Muller (2020) (Appendix C.8 of the BA Report).

D.2.10.1 Approach and Methodology

The Geohydrology Assessment included a desktop review of groundwater characteristics and users in the area, with the aim of determining the potential for groundwater to be used during the construction and operational phases, as well as the risk to nearby groundwater users. The study also included an assessment of the impact on geohydrological resources as a result of the proposed development, as well as provision of recommendations to minimize or mitigate impacts, and to confirm what type of authorisation is required to make use of the groundwater. The specialist study was completed as follows:

- **Task 1**: To obtain all relevant data (i.e. obtain data from the National Groundwater Archive (NGA) and associated groundwater use databases, e.g. Water Authorisation and Registration Management System (WARMS), and GEOSS internal database). Obtain any data from local Department of Water and Sanitation (DWS) [now operating as the Department of Human Settlements, Water and Sanitation (DHSWS)] monitoring boreholes. Obtain relevant geological maps and geohydrological maps, as well as information on groundwater yield and groundwater chemistry of the area.
- **Task 2**: Analyse the data, using geohydrological methods and address the project objectives.
- **Task 3**: Document the results in a report.

D.2.10.2 Relevant Project Aspects relating to Geohydrology Impacts

As mentioned above, the Project Applicant intends to make use of existing boreholes to source groundwater (if available and if suitable) for the construction and operational phases (including cleaning of panels during the operational phase); and if groundwater is not suitable, then the water will be trucked in from the municipality.

Generally, groundwater can be impacted negatively in two manners, namely:

- Over-abstraction (where groundwater abstraction exceeds recharge rates) which can result in the alteration of groundwater flow directions and gradients; and
- Quality deterioration (i.e. from anthropogenic activities negatively impacting groundwater quality).

D.2.10.3 Potential Impacts

It must be noted that the Geohydrology Assessment has considered the worst case in terms of the water requirements, assuming 5 to 8 million litres per year per project for both the construction and operational phases. However, as noted in Section A of this BA Report, the water requirements during the construction phase will only equate to 355 m^3 per month (i.e. 4 260 m^3 per year).

Any construction activities such as the excavation and installation of foundations and piling (narrow diameter holes for foundation purposes) will have minimal to no impact on the groundwater of the site or region, as the groundwater level is approximately 3 – 8 metres below ground level.

The potential impacts are listed below:

Construction Phase:

- Potential lowering of the groundwater level; and
- Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages.

The power lines do not have any operational water usage and thus are not considered to have an impact on the groundwater.

In terms of cumulative impacts, due to the large spatial extent and low water demand in the study area, including other groundwater users within a 30 km radius, the cumulative impact is regarded as insignificant. Furthermore, it is assumed that not all nine PV facilities will be constructed at the same time, hence the requirements will not be 8 million litres * 9 per year per PV project, allowing for sufficient recharge. No indirect impacts have been identified; and no impacts were identified during the decommissioning phase.

D.2.10.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the **construction phase**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS - CONSTRUCTION PHASE						
Lowering of groundwater levels as a result of over-abstraction	*Status*	**Negative**	**Moderate risk (Level 3)**	▪ Adhere to the borehole's safe yield and to monitor water levels and flow. ▪ Boreholes must be correctly yield tested according to the National Standard (SANS 10299-4:2003, Part 4 – Test pumping of water boreholes). This includes a Step Test, Constant Discharge Test and recovery monitoring.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Long Term**				
	Consequence	**Substantial**				
	Probability	**Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				
Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages	*Status*	**Negative**	**Very low risk (Level 5)**	▪ Vehicles must be regularly serviced and maintained to check and ensure there are no leakages. ▪ Any engines that stand in one place for an excessive length of time (e.g. more than 30 days) must have drip trays. ▪ Diesel fuel storage tanks, if required, should be above ground on an impermeable surface in a bunded area. ▪ Vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the construction site camp for this purpose, if off-site refuelling is not possible. ▪ If spillages occur, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, as reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes.	**Very low risk (Level 5)**	High
	Spatial Extent	**Site Specific**				
	Duration	**Short Term**				
	Consequence	**Slight**				
	Probability	**Extremely Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Low**				

D.2.10.5 Concluding Statement

The amount of water required for the developments falls within the abstraction volume allowed under General Authorisation. Only a registration process will have to be followed for the groundwater use; i.e. Section 39 of the National Water Act (Act 36 of 1998, as amended) is applicable. It is recommended that a site visit and hydrocensus be undertaken during the design and planning phase (after Environmental Authorisation is issued, should it be granted) to quantify the number of potential boreholes that could be used for abstraction, as well as, their proximity to the development and other nearby groundwater sources and users. Refer to the separate BA Reports for the PV Facilities for additional information regarding the water usage.

The Geohydrology specialist has recommended that the proposed project be allowed to proceed. In addition, no impacts of significance could be identified and therefore does not pose any risk to the geohydrological conditions on site.

D.2.11 Traffic Impacts

This section is informed by the **technical** Traffic Impact Statement included in Appendix J of the BA Report.

D.2.11.1 Approach and Methodology

The Traffic Impact Statement investigates the transportation implications associated with the abnormal load vehicles transporting components to the site and the transportation of construction materials, equipment and workers to the site during the construction, operational and decommissioning phases. The broad methodology adopted for the Traffic Impact Statement included a site visit in October 2020, literature review, traffic data collection (such as Annual Average Daily Traffic from the Road Network Information System), data analysis, and evaluation of proposed access configurations.

The primary purpose of the Traffic Impact Statement was to evaluate the expected traffic impact of the proposed projects with the main focus on access and traffic distribution during the relevant phases of the proposed projects. The Traffic Impact Statement discusses the condition of existing roads in the vicinity of the site, identifies possible access points to the site and recommends road improvements to minimise the impact on the surrounding road network where necessary.

The Traffic Impact Statement was developed in line with the guidelines of the Manual of Traffic Impact Studies (RR93/635) published by the Department of Transport in 1995 and TMH16 Volume 1 & Volume 2, South African Traffic Impact and Site Assessment Manual, August 2012 published by the Committee of Transport Officials.

D.2.11.2 Relevant Project Aspects relating to Traffic Impacts

The relevant project aspects relating to traffic impacts are linked to the vehicles that need to access the project sites for various reasons.

D.2.11.3 Potential Impacts

The impacts include the following for the construction and decommissioning phases:

- Potential congestion and delays on the surrounding road network;
- Potential impact on traffic safety and increase in accidents with other vehicles or animals;
- Potential change in the quality of the surface condition of the roads;
- Potential dust pollution as a result of the construction and decommissioning phase vehicles; and
- Potential noise pollution as a result of the construction and decommissioning phase vehicles.

The traffic generated during the operational phase will not have a significant impact on the surrounding road network; and indirect impacts have not been identified. The Traffic Impact Statement confirmed that the EGI component of the project is not expected to generate any significant traffic during operations.

D.2.11.4 Impact Assessment

The table below includes an assessment of the potential **direct impacts** identified for the **construction and decommissioning phases**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
DIRECT IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES						
Potential congestion and delays on the surrounding road network	*Status*	**Neutral**	**Very low risk (Level 5)**	▪ Stagger delivery trips and schedule trips and deliveries outside of the peak hours. ▪ Staff trips should also occur outside of the peak hours, *where possible*. ▪ The route to the site should be further investigated to ensure that the abnormal loads are not obstructed at any point by geometric, height and width limitations along the route. ▪ The applicable permits to transport the abnormal loads should be obtained.	**Very low risk (Level 5)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Slight**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential impact on traffic safety and increase in accidents with other vehicles or animals	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Speed control by means of stop and go system and speed limit road signage.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential change in the quality of the surface condition of the roads	*Status*	**Neutral**	**Very low risk (Level 5)**	▪ Implement regular maintenance of gravel external access roads (i.e. external public roads under the authority of the Western Cape Government, such as the R356) by the contractor during the construction period and the operator during the operational phase. ▪ Ensure access roads are restored to original pre-construction road conditions. ▪ Ensure that there is upgrading of the internal farm access road (i.e. internal	**Very low risk (Level 5)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Slight**				
	Probability	**Likely**				

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
	Reversibility	**High**		private roads leading off the R356) to suitable standards as specified by the civil engineer and regular maintenance of the access road during all phases of the project, especially during the construction and decommissioning phases. ▪ The route to the site should be further investigated to ensure that the abnormal loads are not obstructed at any point by geometric, height and width limitations along the route. ▪ The applicable permits to transport the abnormal loads should be obtained.		
	Irreplaceability	**Replaceable**				
Potential dust pollution as a result of the construction and decommissioning phase vehicles	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Implement dust control on the gravel roads on site. ▪ Implement speed control by means of a stop and go system and speed limit road signage on site.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential noise pollution as a result of the construction and decommissioning phase vehicles	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Stagger delivery trips and schedule trips and deliveries outside of the peak hours. ▪ Staff trips should also occur outside of the peak hours, *where possible*.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				

The table below includes an assessment of the potential **cumulative impacts** identified for the **construction and operational phases**.

Impact	*Impact Criteria*		*Significance / Ranking (Pre-Mitigation)*	*Potential mitigation measures*	*Significance / Ranking (Post-Mitigation)*	*Confidence Level*
CUMULATIVE IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES						
Potential congestion and delays on the surrounding road network	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Stagger delivery trips and schedule trips and deliveries outside of the peak hours. ▪ Staff trips should also occur outside of the peak hours, *where possible*. ▪ The route to the site should be further investigated to ensure that the abnormal loads are not obstructed at any point by geometric, height and width limitations along the route. ▪ The applicable permits to transport the abnormal loads should be obtained.	**Very low risk (Level 5)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Substantial**				
	Probability	**Very Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential impact on traffic safety and increase in accidents with other vehicles or animals	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Speed control by means of stop and go system and speed limit road signage.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Moderate**				
	Probability	**Likely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential change in the quality of the surface condition of the roads	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Implement regular maintenance of gravel external access roads (i.e. external public roads under the authority of the Western Cape Government, such as the R356) by the contractor during the construction period and the operator during the operational phase. ▪ Ensure access roads are restored to original pre-construction road conditions.	**Very low risk (Level 5)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Substantial**				
	Probability	**Very Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				

Impact	***Impact Criteria***		***Significance / Ranking (Pre-Mitigation)***	***Potential mitigation measures***	***Significance / Ranking (Post-Mitigation)***	***Confidence Level***
Potential dust pollution as a result of the construction and decommissioning phase vehicles	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Implement dust control on the gravel roads on site. ▪ Implement speed control by means of a stop and go system and speed limit road signage on site.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Severe**				
	Probability	**Very Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				
Potential noise pollution as a result of the construction and decommissioning phase vehicles	*Status*	**Neutral**	**Low risk (Level 4)**	▪ Stagger delivery trips and schedule trips and deliveries outside of the peak hours. ▪ Staff trips should also occur outside of the peak hours, *where possible*.	**Low risk (Level 4)**	High
	Spatial Extent	**Local**				
	Duration	**Medium Term**				
	Consequence	**Severe**				
	Probability	**Very Unlikely**				
	Reversibility	**High**				
	Irreplaceability	**Replaceable**				

D.2.11.5 Concluding Statement

Provided that the above mitigation measures are adhered to, the proposed development of the collective PV and EGI projects are supported from a traffic engineering perspective. No other remedial or mitigation measures will be required to accommodate the additional traffic generated by the proposed projects.

D.2.12 Environmental Sensitivity Mapping

Based on the impact assessment undertaken and the relevant environmental sensitivities identified, the site layout of the solar PV facilities has been identified and shown in Figure D.8 and Appendix B of this BA Report. Based on the specialist studies, the key environmental features that have been avoided in terms of the layout of the facilities are listed below.

- **Agriculture**
  - The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts. Refer to Figure D.3 for the agricultural sensitivity map.

- **Visual**
  - Access roads and power lines are permissible to cross the very high sensitivity areas associated with the drainage lines and topographic features. Ideally, power lines could cross these features at right angles. Refer to Figure D.4 for the visual sensitivity map.

- **Heritage (Archaeology and Cultural Landscape)**
  - There are currently no areas within the PV layouts that require avoidance but there are other areas, as described above, that need to be avoided. Refer to Figure D.5 for the heritage sensitivity map.

- **Palaeontology**
  - The majority of fossil sites recorded fall within designated No-Go areas lying outside the project footprint. These fossils are of widespread occurrence within the Ceres Karoo region and are not of high scientific interest or conservation value. No fossil sites of high sensitivity or No-Go areas were identified within the solar PV project areas during the palaeontological field survey and the palaeontological sensitivity of the project area is assessed as generally low. No special mitigation measures are recommended for the recorded fossil sites, all of which are assigned a low provisional field rating.

- **Terrestrial Biodiversity and Species**
  - The proposed areas are associated with the level terrain within the site and primarily low levels of ecological significance. Much of the land in question has been subject to extensive grazing and shows limited diversity and cover.
  - Areas of potential improved botanical diversity or “niche” environments, in particular, ridges or scarps, have been excluded from the development, including the moderate slopes and scarps. Such areas include areas of significant sheet wash. These areas are allocated moderate sensitivity. The proposed project infrastructure excludes these areas of moderate terrestrial sensitivity, particularly to the south and establish a buffer or set

back from the high sensitivity areas within the riparian zones. The layout also avoids plateau and ridges.
- A significant terrestrial buffer has been established around the Klein Droëlaagte, Droëlaagte and Groot Rivers. The riparian extent has been identified as high sensitivity. It is acceptable for the power lines to cross these areas.
- Refer to Figure D.6 for the ecology sensitivity map.

- **Aquatic Biodiversity and Species**
  - The terrestrial environments are deemed to have "low sensitivity" from an ecological perspective.
  - The riparian environments are deemed to have a "high sensitivity".
  - Areas of terrestrial importance and a "buffer" at the interface of the terrestrial and riparian areas, and includes areas of sheet wash and flood extremes.
  - Refer to Figure D.6 for the ecology sensitivity map.

- **Riverine Rabbit**
  - The power line routes do impinge into the High or Very High sensitivity areas; however the specialist notes that it is however acceptable for access roads and power lines to traverse these areas where necessary; and if there no existing roads that can be upgraded or alternative suitable access possibilities.
  - Refer to Figure D.6 for the ecology sensitivity map.

- **Avifauna**

The following areas have been avoided by the proposed layout of the PV Facilities:
- High sensitivity (Mitigation required): Surface water: Included are areas within 300 m of water troughs and earth dams, and all major drainage lines.
- Medium sensitivity (Mitigation potentially required): Succulent Karoo: The entire study area is rated as medium sensitivity due to the regular presence of collision-prone species such as Ludwig's Bustard, Karoo Korhaan and Southern Black Korhaan.
- Refer to Figure D.7 for the avifauna sensitivity map.

- **Socio-Economic**
  - Sensitivity maps in terms of areas to avoid are not applicable for the Socio-Economic Assessment.

- **Geohydrology**
  - Sensitivity maps in terms of areas to avoid are not applicable for the Geohydrology Assessment.

- **Traffic**
  - Sensitivity maps in terms of areas to avoid are not applicable for the Traffic Impact Statement.

Appendix A of this Final BA Report also includes sensitivity maps for each power line route, as requested by the DEFF. Key sensitivity features have been annotated in Figure D.9 (i.e. sensitivity and feature map). For detailed feature maps, refer to the Specialist Assessments (Appendix C of the Final BA Report).

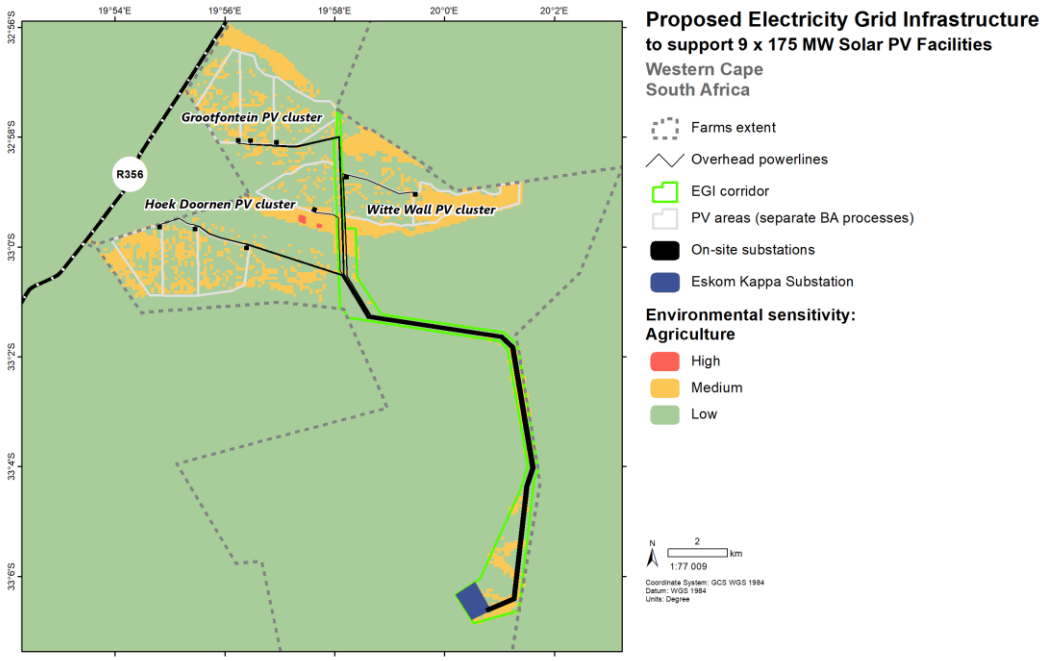


Figure D.3. Sensitivity Map for Agriculture

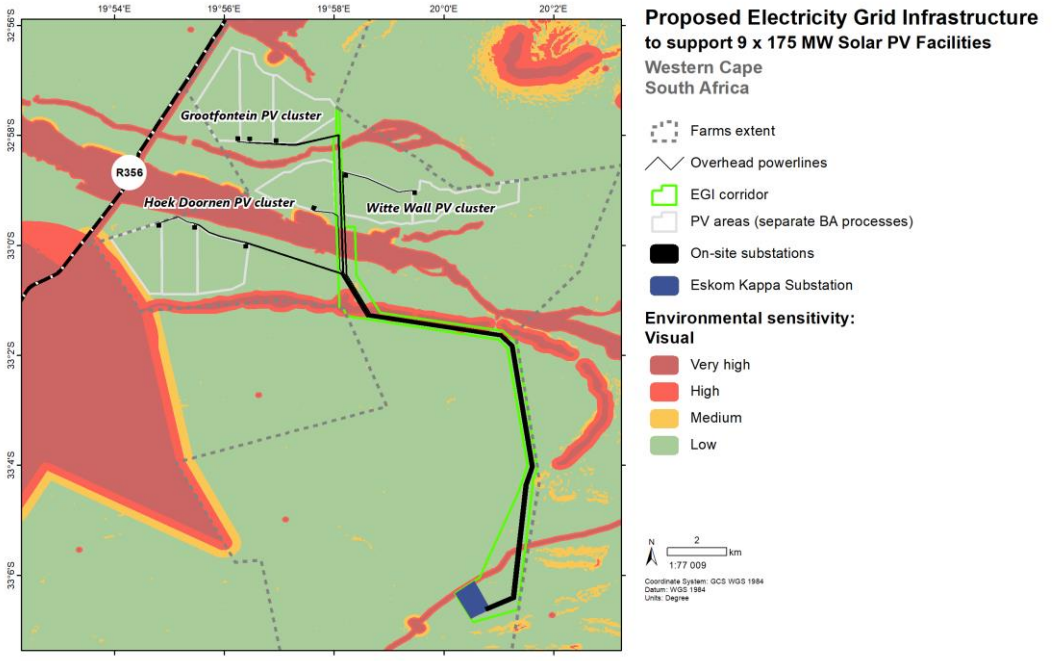


Figure D.4. Sensitivity Map for Visual Aspects

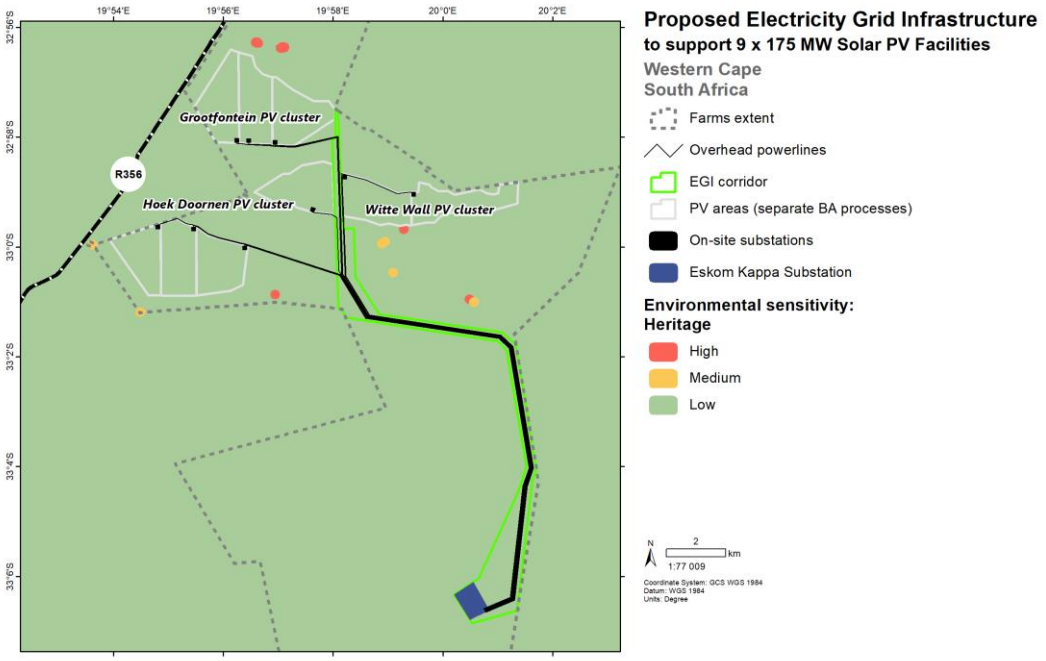


Figure D.5. Sensitivity Map for Heritage

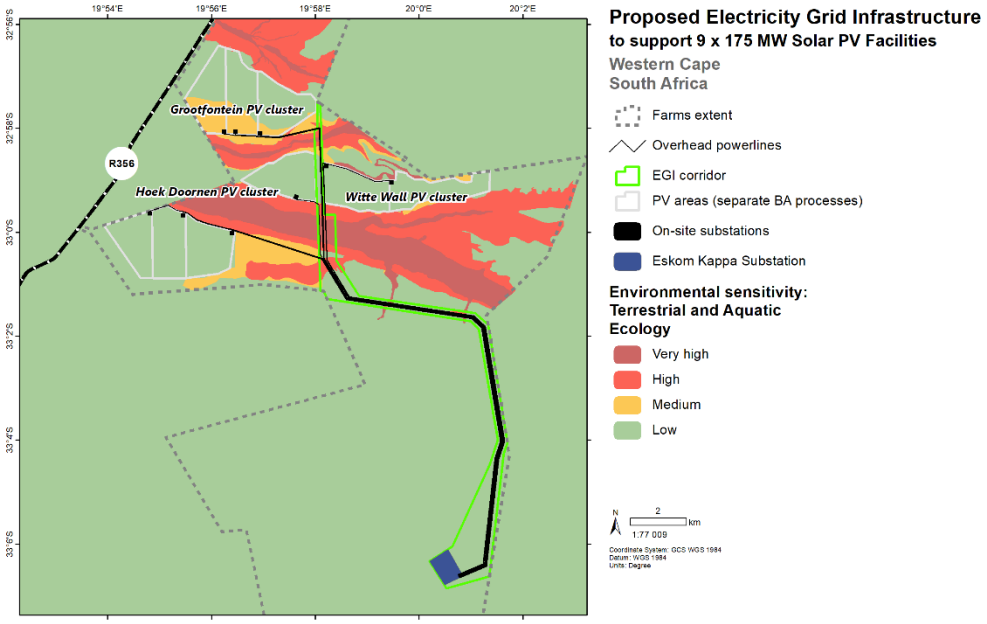


Figure D.6. Sensitivity Map for Terrestrial and Aquatic Ecology

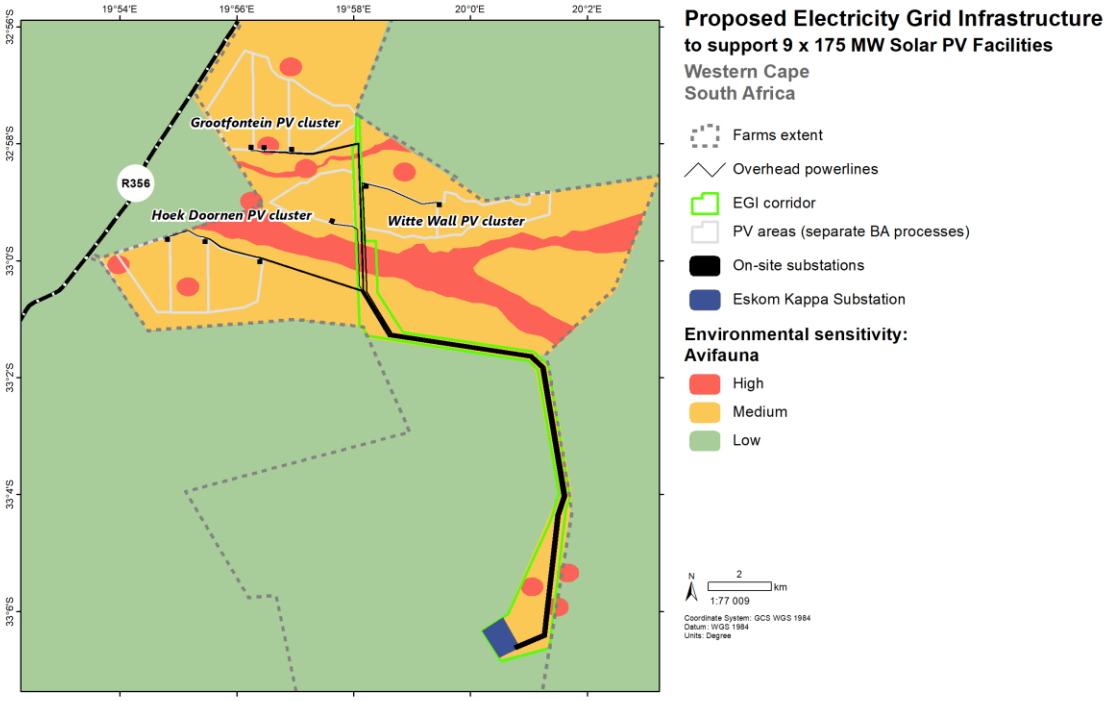


Figure D.7. Sensitivity Map for Avifauna

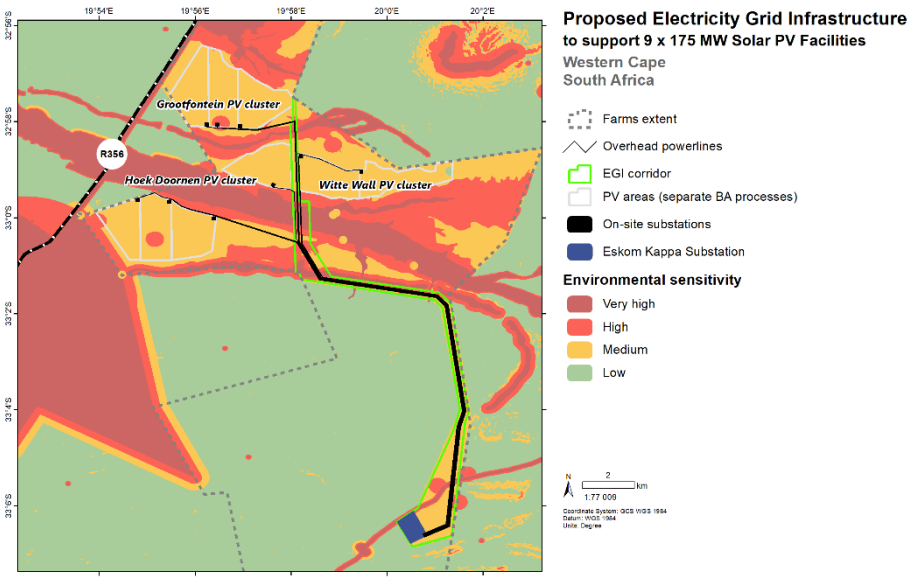


Figure D.8. Combined Sensitivity Map for the proposed projects

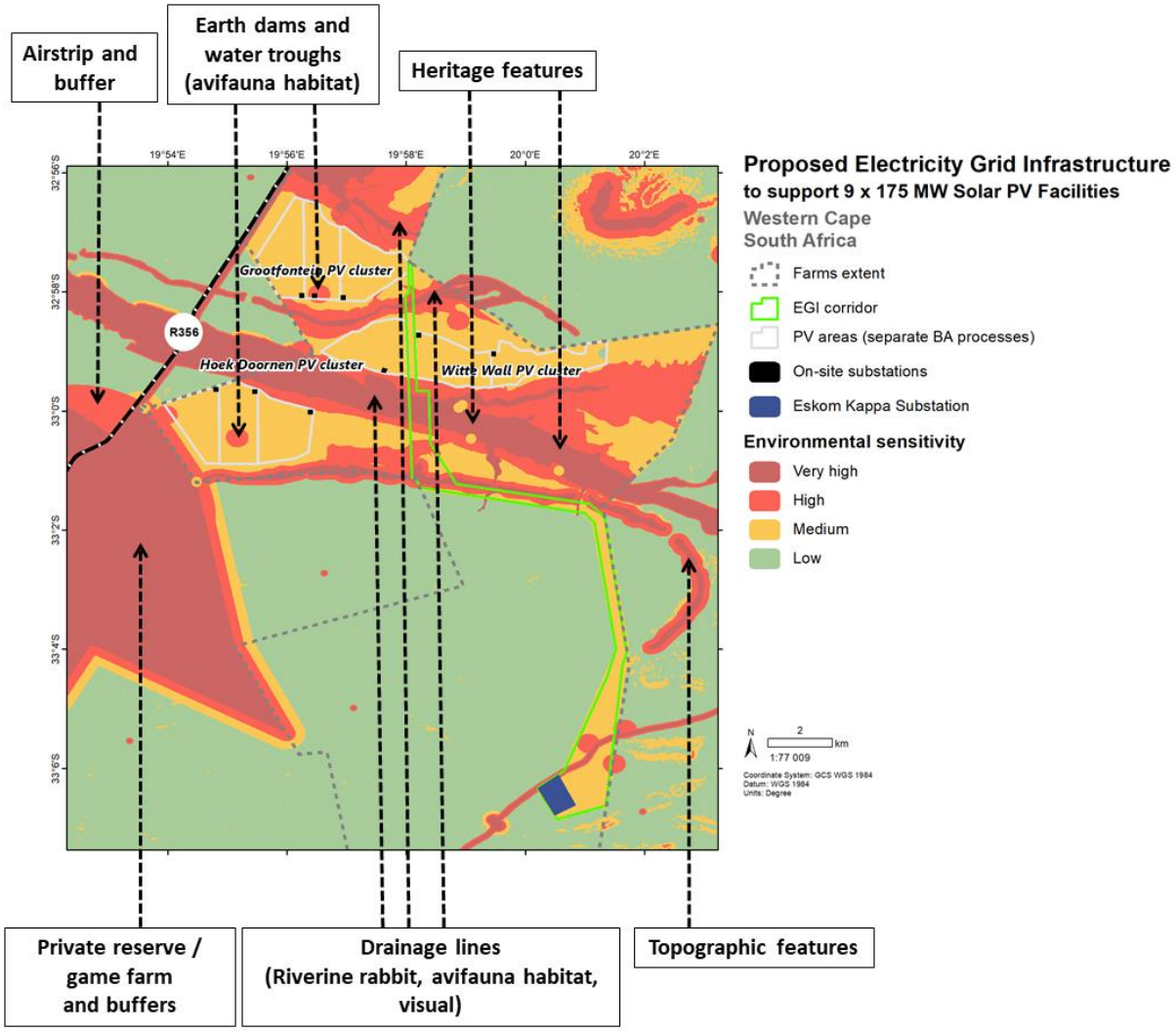


Figure D.9. Combined Sensitivity and Key Features Map for the proposed projects

SECTION E: RECOMMENDATION OF PRACTITIONER & ENVIRONMENTAL IMPACT STATEMENT

This BA Report has investigated and assessed the significance of potential positive and negative direct, indirect and cumulative impacts associated with the proposed **EGI projects that will support the separately assessed nine PV facilities and associated infrastructure**. No negative impacts have been identified within this BA that, in the opinion of the EAP who has conducted this BA Process, should be considered "fatal flaws" from an environmental perspective, and thereby necessitate substantial re-design or termination of the project.

Section 24 of the Constitutional Act states that "everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development". Based on this, this BA was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMPr in Appendix G and Appendix H of this BA Report).

It is understood that the information contained in this BA Report and appendices is sufficient to make a decision in respect of the activity applied for. It is recommended that each EA be valid for a period of 10 years.

Alternatives

As noted above, in Section A of this report, the preferred activity was determined to be the development of a renewable energy facility on site using solar PV as the preferred technology. The EGI assessed in this BA is essential to the operation of the proposed project. In terms of the preferred location of the site, even though location alternatives were not assessed the layout was designed after provision of sensitivity data by the specialists to ensure that it would have the least possible overall impact. All the specialists assessed a large area in order to find the best location for the PV facilities and associated infrastructure. The Specialists considered desktop data, field work, existing literature and the National Web-based Environmental Screening Tool to inform the identification of sensitivities. Based on this, a preferred layout for the solar PV facilities was determined. This layout avoids the features on site that have been identified as no-go areas, as explained in Section B and Section D.

Need and Desirability of the Proposed Projects

This BA considered the nature, scale and location of the proposed development as well as the wise use of land (i.e. is this the right time and place for the development of these proposed projects). These projects are located in REDZ 2 (Komsberg) which is a geographical area that has been identified on a strategic planning level to have reduced negative environmental impacts but high

commercial attractiveness (due to its proximity to, inter alia, the national grid) and socio-economic benefit to the country. The development of solar energy and associated EGI is therefore important for South Africa to reduce its overall environmental footprint from power generation (including externality costs), and thereby to steer the country on a pathway towards sustainability. On a municipal planning level, the proposed projects support the objectives of the Witzenberg Local Municipality's IDP (2017-2022) [Amended IDP (2020 – 2021)] which identifies renewable energy as a key economic sector. The Witzenberg Local Municipality IDP promotes the creation of an enabling environment to attract investment and support local economy. The third review of the 2017-2022 Cape Winelands District Municipality IDP (2020-2021; Page 49 and 51) also promotes renewable energy development as it states:

- "The provincial energy focus is on lowering carbon emissions and local generation (e.g. renewable and greater use of gas).
- As a principle-led (and policy) response, authorities to consider and promote the development of renewable energy power generation capacity subject to appropriate scale, form and location".

The Witzenberg Local Municipality's IDP (2017-2022) [Amended IDP (2020 – 2021)] and SDF (2020; Page 65) states that any renewable energy developments in the municipal area should preferably be located inside of the Komsberg REDZ, however, proposals for such development outside of this boundary will be considered on a case by case basis based on its own merits. The proposed projects are located within the boundary of the Komsberg REDZs, therefore is in line with the IDP and SDF of the Witzenberg Local Municipality.

The proposed projects are therefore aligned with the vision and goals of the District and Local Municipality. It will also stimulate the creation of employment which is much needed in the municipal areas. It will therefore be supportive of the IDP's objective of creating more job opportunities.

Summary of Key Impact Assessment Findings

Based on the findings of the specialist studies, the proposed projects are considered to have an overall low negative environmental impact and an overall low to moderate positive socio-economic impact (with the implementation of respective mitigation and enhancement measures). Table E.1 below provides a summary of the impact assessment for each phase of the proposed projects **post mitigation for direct impacts**. Table E.2 provides the same information for the **cumulative impacts**.

As indicated in Table E.1, it is clear that the majority of the **direct negative impacts** were rated with a **low to very low post mitigation impact significance** for the **construction phase**, with only the Terrestrial Biodiversity and Species and Avifauna impacts being rated as **moderate**. In terms of the operational and decommissioning phases, the majority of the **direct negative impacts** were rated with a **low post mitigation impact significance**, with only the Avifauna impacts being rated as **moderate**. In terms of **positive impacts**, the Socio-Economic impacts are rated as **low to moderate significance** for the construction phase; **very low to high** for the operational phase; and **low** for the decommissioning phase.

Based on Table E.2, the majority of the **cumulative negative impacts** were rated with a **low post mitigation impact significance** for the **construction phase**, with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as **moderate**. The same trend is applicable to the **operational phase**, with visual impacts being rated as **moderate**. During the decommissioning phase, cumulative impacts were not identified and/or were considered insignificant, however for those that were rated, it resulted in an overall **low to very low post mitigation impact significance,** with only the Heritage (Archaeology and Cultural Landscape) impacts being rated as **moderate**. In terms

of **positive impacts**, the Socio-Economic impacts are rated as **moderate significance** for the construction and operational phases.

Table E.1. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the EGI Projects

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Visual	**Low**		**Low**		**Very Low**	
Heritage (Archaeology and Cultural Landscape)	**Low**		**Low**		**Low**	
Palaeontology	**Very Low**		**Insignificant and/or not identified and/or not applicable**		**Insignificant and/or not identified and/or not applicable**	
Terrestrial Biodiversity and Species	**Moderate**		**Low**		**Low**	
Aquatic Biodiversity and Species	**Low**		**Low**		**Low**	
Riverine Rabbit	**Low**		**Low**		**Insignificant and/or not identified and/or not applicable**	
Avifauna	**Not identified**		**Moderate**		**Not identified**	
Socio-Economic	**Very Low**	**Low**	**Insignificant and/or not identified and/or not applicable**		**Low**	
Geohydrology	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**		**Insignificant and/or not identified and/or not applicable**	
Traffic	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**		**Low**	**Very Low**
DIRECT POSITIVE IMPACTS						
Socio-Economic	**Low**	**Moderate**	**Very Low**	**High**	**Low**	

Table E.2. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the EGI Projects

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Visual	**Low**	**Low**	**Very Low**
Heritage (Archaeology and Cultural Landscape)	**Moderate**	**Moderate**	**Moderate**
Palaeontology	**Very Low**	**Insignificant and/or not identified and/or not applicable**	**Insignificant and/or not identified and/or not applicable**
Terrestrial Biodiversity and Species	**Low**	**Low**	**Neutral**
Aquatic Biodiversity and Species	**Low**	**Low**	**Insignificant and/or not identified and/or not applicable**
Riverine Rabbit	**Low**	**Low**	**Insignificant and/or not identified and/or not**

Specialist Assessment	Construction Phase		Operational Phase	Decommissioning Phase	
CUMULATIVE NEGATIVE IMPACTS					
				applicable	
Avifauna	**Not identified**		**Low**	**Not identified**	
Socio-Economic	**Low**		**Low**	**Insignificant and/or not identified and/or not applicable**	
Geohydrology	**Insignificant**		**Insignificant**	**Insignificant and/or not identified and/or not applicable**	
Traffic	**Low**	**Very Low**	**Insignificant and/or not identified and/or not applicable**	**Low**	**Very Low**
CUMULATIVE POSITIVE IMPACTS					
Socio-Economic	**Moderate**		**Moderate**	**Insignificant and/or not identified and/or not applicable**	

All of the specialists have recommended that the proposed projects receive EAs if the recommended mitigation measures are implemented.

Overall Environmental Impact Statement

Taking into consideration the findings of the BA Process, as well as the fact that the proposed projects will be located within Komsberg REDZ (REDZ 2), it is the opinion of the EAP, that the project benefits outweigh the costs and that the projects will make a positive contribution to sustainable infrastructure development in the Ceres Karoo, Ceres and Touws River regions. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed projects receive EAs in terms of the EIA Regulations promulgated under the NEMA.

Cumulative Environmental Impact Statement

The cumulative impacts have been assessed by all the specialists on the project team. The cumulative assessment included approved renewable energy projects within a 30 km radius of the project sites, as well as existing and planned transmission lines, as well as all nine proposed Veroniva PV projects and nine proposed Veroniva power line projects. No cumulative impacts have been identified that were considered to be fatal flaws. The specialists recommended that the projects receive EA in terms of the EIA Regulations promulgated under the NEMA, including consideration of cumulative impacts. It is also important to note that the proposed project sites are located within REDZ 2 (Komsberg REDZ), which supports the development of large scale wind and solar energy developments. The proposed projects are therefore in line with the national planning vision for wind and solar development in South Africa.

Conditions to be included in the EA

In order to ensure the effective implementation of the mitigation and management actions, an EMPr has been compiled and is included in Appendix G and Appendix H of this BA Report. The mitigation measures necessary to ensure that the proposed projects are planned and carried out in an environmentally responsible manner are listed in this EMPr. The EMPr includes the mitigation measures noted in this report and the specialist studies. The EMPr is a dynamic document that should be updated as required and provides clear and implementable measures for the proposed project. The frequency of monitoring and auditing compliance with the conditions of the EA (should such an authorisation be granted) and EMPr, is recommended in the EMPr. The compliance

monitoring ranges from weekly to bi-monthly to monthly. It is recommended that regular monitoring be undertaken, as specified in the EMPr. It is further recommended that the submission of compliance reports to the Competent Authority be undertaken quarterly.

Listed below are the **main** recommendations that should be considered for inclusion in the EAs (should such authorisations be granted by the DEFF). These main recommendations as well as additional recommendations are included in the EMPr and BA Report.

In line with the approval of the combination and multiple EA request (as noted in Appendix I of the BA Report), it is proposed that nine separate EAs be issued for the power lines.

- **Agriculture Impacts**

The conclusion of the Agricultural Compliance Statement is that the proposed projects are acceptable and the recommendation for its approval is not subject to any conditions.

- **Visual Impacts:**
    - Combine the connecting power lines from Witte Wall, Grootfontein and Hoek Doornen, where possible
    - Locate substations in unobtrusive low-lying areas, away from public roads.
    - Avoid power lines on hillcrests and ridge skylines where possible.
    - Use monopoles in preference to lattice pylons.
    - Keep maintenance / access roads as narrow as possible, and use existing roads or tracks as far as possible.
    - Fit outdoor or security lighting at substations with reflectors to minimise light spillage.

- **Heritage Impacts (Archaeology and Cultural Landscape):**

    - A pre-construction archaeological survey must be carried out to determine (1) whether any further sites are present and (2) the best area for sampling of background scatter artefacts;
    - Protection of the possible grave at waypoint 150 with a 30 m buffer. The feature should be fenced and marked as a sensitive area. This is only applicable to the Witte Wall PV 1 and Witte Wall PV 2 EGI and PV projects.
    - Pottery scatter at waypoint 145 must be collected. This is only applicable to the Witte Wall PV 2 and EGI project.
    - No activity is to take place north of the existing farm fence alongside waypoint 177, an existing LSA site. The existing farm fence must be retained in its current location and all project activities kept to the south of it. This is only applicable to the Grootfontein PV 1, PV 2 and PV 3 EGI and PV projects.
    - The stone boundary beacon at waypoint 132 must be protected from harm. Any road widening needed here must be undertaken towards the north. This is only applicable to the Hoek Doornen PV 3 EGI and PV project.
    - If any fossils, archaeological material or human burials are uncovered during the course of the development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

- **Palaeontological Impacts**
  - The ECO should be made aware of the possibility of important fossil remains (bones, teeth, petrified wood, plant-rich horizons, fossil termitaria etc.) being found or unearthed during the construction phase of the development.
  - Monitoring for fossil material of all major surface clearance and deeper (>1m) excavations by the ECO on an on-going basis during the construction phase is recommended.
  - Significant fossil finds should be safeguarded and reported at the earliest opportunity to Heritage Western Cape for recording and sampling by a professional palaeontologist.
  - The palaeontologist must obtain a Fossil Collection Permit from Heritage Western Cape and all fossil material collected must be properly curated in an approved repository (museum / university collection).

- **Terrestrial Biodiversity and Species Impacts**
  - Maintenance and establishment of an ambulatory set back of more than 100 m from the identified riparian areas and points of sheet wash as per the layout plan presented in the Terrestrial Biodiversity and Species Assessment (Appendix C.4 of the BA Report).
  - Construction and establishment of the PV modules (i.e. the PV array area) should be undertaken without the clearance of vegetation. Where vegetation proves excessively tall and effects either construction or operation, pruning may be effected.
  - A detailed storm water management and drainage plan should be developed that considers inter alia, surface flows arising from elevated areas above the PV facilities and its discharge from the facilities. This philosophy must include attenuation and energy dissipation mechanisms and redress of erosion and sheet flow across site.
  - The laydown area for the PV facilities should be subject to compaction and the use of dust suppressants when in operation, to prevent excessive particulate matter becoming airborne.
  - Management of fauna within the site and surrounds, as well as the incorporation of wildlife porosity into fence lines should be undertaken, as well as the implementation of measures on the energised fence line to avoid wildlife mortalities.
  - Management of exotic weed invasion that may arise must be undertaken during all phases of the development.
  - A detailed plan relating to the limiting of electrical light pollution on site must be compiled.
  - General land management practices to avoid excessive erosion, dust emissions and possible sources of pollution to ground and surface water resources must be followed.

- **Aquatic Biodiversity and Species Impacts**[8]
  - Maintain the riparian areas presented in the Aquatic Biodiversity and Species Assessment (Appendix C.5 of the BA Report) as general “exclusion areas” for all operations, with the exception of the establishment of the overhead power lines.
  - Management of exotic weed invasion that may arise within riparian areas as a consequence of disturbance.

- **Riverine Rabbit Impacts**
  - Adhere to the sensitivity maps provided within this assessment when determining the final layout of the proposed project.

[8] Where the conditions for EA for the Aquatic Biodiversity and Species Impacts are the same as that noted for the Terrestrial Biodiversity and Species Impacts, they have not been repeated.

- **Avifauna Impacts**

  - Operational Phase (Direct and Cumulative):
    - If a power line has to be routed across a high sensitivity zone, mitigation in the form of Bird Flight Diverters will be required.
    - The avifaunal specialist must conduct a walk-through prior to implementation to demarcate sections of the power line that need to be marked with Eskom approved bird flight diverters

- **Socio-Economic Impacts**

  - Construction Phase:
    - The developer should make every effort to ensure the majority of construction workers are de facto residents of the Ceres Karoo, Touws River and/or Ceres region.
    - Where possible, subcontract to local construction companies from this region.
    - Ceres Karoo residents should be given preference in employment: this will require an innovative recruitment process that does not rely on technology or locals registering in a nearby town, as well as the provision of transport from decentralised points within the area.
  - Operational Phase:
    - The developer should make every effort to ensure the majority of unskilled workers employed during this phase are de facto residents of the Ceres Karoo, Touws River and/or Ceres region.
    - Employment opportunities and the existence of the employment desk must be communicated to the local communities in Ceres Karoo, Touws River and/or Ceres region.
    - The employment desk registers compiled during construction phase should be consulted to identify appropriately qualified candidates with preference given to Ceres Karoo residents where possible.
  - Decommissioning Phase:
    - The developer should comply with relevant South African labour legislation when retrenching employees.
    - The developer should implement appropriate succession training of locally employed staff earmarked for retrenchment during decommissioning.
    - All project infrastructures should be decommissioned appropriately and thoroughly to avoid misuse.
    - Retain a contact person responsible for liaising with local residents.

- **Geohydrology Impacts**
  - A site visit and hydrocensus conducted by groundwater specialist should be undertaken during the design and planning phase (after EA is issued, should it be granted) to determine the number of groundwater users and abstraction points. This must include water level recording and groundwater sampling of potential boreholes to be used for the development.

- **Traffic Impacts**
  - Stagger delivery trips and schedule deliveries outside of the peak traffic periods.
  - Staff trips should also occur outside of the peak hours where possible.
  - Implement dust control on the gravel roads on site.
  - Speed limits and stop and go facilities should be implemented to ensure reduced speeds along the roads on site.

- Ensure that there is regular maintenance of the gravel external access roads (i.e. external public roads under the authority of the Western Cape Government, such as the R356) used to access the sites by the contractor during the construction period and the operator during the operational phase.
- Ensure that there is upgrading of the internal farm access road (i.e. internal private roads leading off the R356) to suitable standards as specified by the civil engineer and regular maintenance of the access road during all phases of the project, especially during the construction and decommissioning phases.
- The route to the site should be further investigated to ensure that the abnormal loads are not obstructed at any point by geometric, height and width limitations along the route.
- The applicable permits to transport the abnormal loads should be obtained.

- **General**
  - Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.
  - If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.

Paul Lochner

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NAME OF EAP

19 February 2021

_____ _____

SIGNATURE OF EAP DATE

References:

Refer to detailed reference lists included in each Specialist Assessment chapter in Appendix C of this Final BA Report. In addition to each of the Specialist Assessments chapters referred to in the text above, as well as various footnotes, below is a list of the key references used.

Cape Winelands District Municipality (2020). Cape Winelands District Municipality Integrated Development Plan 2017 – 2021 Third Review (IDP 2020 – 2021 Adopted May 2020). Stellenbosch. Cape Winelands District Municipality.

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