



DRAFT BASIC ASSESSMENT REPORT

Basic Assessment for the
Proposed Development of
four 175 MW Solar
Photovoltaic Facilities and
associated Infrastructure
(i.e. Hoek Doornen PV 1,
Hoek Doornen PV 2, Hoek
Doornen PV 3, and Hoek
Doornen PV 4), near Touws
River, Western Cape

DECEMBER 2020

Prepared for:
Veroniva (Pty) Ltd

VERONIVA
Renewable Energy Development

Prepared by:
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Management Services
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South Africa



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. **It must be noted that this report only covers the proposed Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects, as detailed below. Separate reports are provided for the remaining PV projects.**

Table A: Project Names, Applicants and 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	<ul style="list-style-type: none"> ▪ Witte Wall RE/171 	<ul style="list-style-type: none"> ▪ 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	<ul style="list-style-type: none"> ▪ Grootfontein RE/149 ▪ Grootfontein 5/149 	<ul style="list-style-type: none"> ▪ 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 1¹	Hoek Doornen PV 1 (PTY) LTD	<ul style="list-style-type: none"> ▪ Hoek Doornen 1/172 	<ul style="list-style-type: none"> ▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Hoek Doornen PV 2¹	Hoek Doornen PV 2 (PTY) LTD		
Hoek Doornen PV 3¹	Hoek Doornen PV 3 (PTY) LTD		
Hoek Doornen PV 4¹	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 will be 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

¹ This BA Report only addresses this project. Separate reports are compiled for the remaining PV projects

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
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.	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.	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.	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)

Combined Applications for EA have been submitted to the DEFF together with the Draft BA Reports.

As explained above, this Draft BA Report only deals with the proposed **Hoek Doornen Farm i.e. the 4 PV Facilities (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4), 4 on-site substations, 4 Lithium Ion BESS's and all associated infrastructure.**

An integrated Public Participation Process is being undertaken for the proposed projects.

This Draft BA Report is currently being released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period. All comments submitted during the 30-day review will be incorporated and addressed, as applicable and where relevant, into the Final BA Report. The Final BA Report will then be 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 proposed Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects, 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 Draft BA Report.

DRAFT BASIC ASSESSMENT REPORT: Basic Assessment for the Proposed Development of four 175 MW Solar Photovoltaic (PV) Facilities and associated Infrastructure (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4), near Touws River, Western Cape

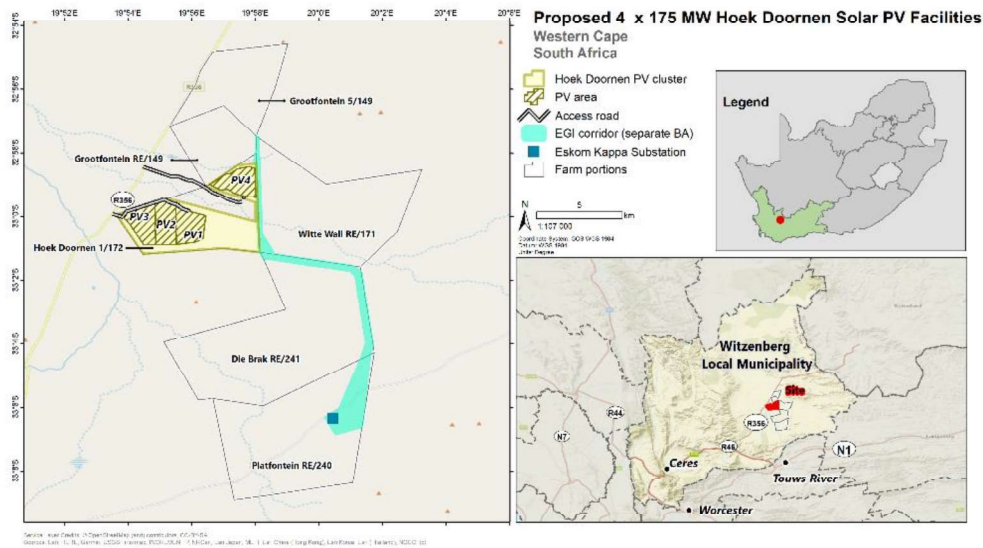


Figure A: Locality Map of the Proposed Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 Projects

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 Hoek Doornen PV BA Process

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	EAP and Project Leader
Rohaida Abed (<i>Pr.Sci.Nat.</i>)	CSIR	Project Manager
Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Project Officer
Luanita Snyman-van der Walt (<i>Pr.Sci.Nat.</i>)	CSIR	Project Mapping
Lizande Kellerman (<i>Pr.Sci.Nat.</i>)	CSIR	Project Specialist
Specialists		
Johann Lanz (<i>Pr.Sci.Nat.</i>)	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 (<i>Pr.Sci.Nat.</i>), Luke Maingard and Alex Whitehead (<i>Pr.Sci.Nat.</i>)	Sustainable Development Projects cc	Terrestrial Biodiversity and Species Impact Assessment
Simon Todd (<i>Pr.Sci.Nat.</i>)	3Foxes Biodiversity Solutions	Riverine Rabbit
Simon Bundy (<i>Pr.Sci.Nat.</i>), Luke Maingard and Alex Whitehead (<i>Pr.Sci.Nat.</i>)	Sustainable Development Projects cc	Aquatic Biodiversity and Species Impact Assessment

Name	Organisation	Role/ Specialist Study
Chris van Rooyen and Albert Froneman (<i>Pr.Sci.Nat.</i>)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Sandra Hill	Private	Socio-Economic Impact Assessment
Charl Muller	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment
Lizande Kellerman (<i>Pr.Sci.Nat.</i>), Rohaida Abed (<i>Pr.Sci.Nat.</i>), Luanita Snyman-van der Walt (<i>Pr.Sci.Nat.</i>)	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman (<i>Pr.Sci.Nat.</i>), Rohaida Abed (<i>Pr.Sci.Nat.</i>), Luanita Snyman-van der Walt (<i>Pr.Sci.Nat.</i>)	CSIR	Defence Site Sensitivity Verification
Technical Input		
Annebet Krige <i>Pr Eng</i>	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).

The proposed four 175 MW Solar PV facilities (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4) will each cover an approximate area of 250 hectares (ha). This excludes access roads leading to the site. The specialists assessed larger areas on the affected farm portions in order to avoid environmental constraints and sensitivities (highlighted by the specialists), during the siting and final design of the facilities and associated infrastructure.

The proposed projects will make use of PV technology to generate electricity from solar energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate 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 solar facilities will **each** consist of the following components (i.e. the project components are the same for Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4, except where specified):

- Solar Field, comprising Solar Arrays with a maximum height of 10 m and maximum footprint of 250 hectares, including the following:
 - PV Modules;
 - Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), Dual Axis Tracking (aligned east-west and north-south), Fixed Tilt Mounting Structure or Bifacial Solar Modules;
 - Solar module mounting structures comprised of galvanised steel and aluminium; and
 - Foundations which will likely be drilled and concreted into the ground.
- Building Infrastructure:
 - Offices (maximum height 7 m and footprint of 1000 m²);
 - Operational and maintenance control centre (maximum height 7 m and footprint 500 m²);
 - Warehouse/workshop (maximum height 7 m and footprint 500 m²);
 - Ablution facilities (maximum height 7 m and footprint 50 m²);
 - Converter/inverter stations (height from 2.5 m to 7 m (maximum) and footprint 2500 m²);
 - On-site substation and/or a switching substation (footprint 20 000 m²); and
 - Guard Houses (height 3 m, footprint 40 m²).
- Associated Infrastructure:
 - On-site substation and/or a switching substation (the relevant section that will be maintained by the Independent Power Producer);
 - Internal 33 kV power lines/underground cables (either underground to a maximum depth of 1.6 m or above ground with a height of 9 m);

- Lithium Ion BESS that will have a height of up to 5 – 10 m, and will cover an area of up to 8 hectares (within the laydown area of the PV Facility);
- Underground low voltage cables or cable trays (underground to maximum depth of 1.4 m);
- Access roads ranging between 4 - 8 m wide.
- Internal gravel roads (width of 4 - 5 m);
- Fencing (between 2 – 3 m high) around the PV Facilities;
- Game fencing around each PV Facility;
- Panel maintenance and cleaning area;
- Storm water channels; and
- Construction work area (i.e. laydown area of maximum 13 ha).

The separate BA Process for the EGI (i.e. **Report 4: EGI to support the PV Facilities**) addresses the following infrastructure to support each of the PV Facilities:

- 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 farms Witte Wall and 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 published in GN R326, R327, R325 and R324, as well as GN 114 for procedures within a REDZs, a full BA Process is required for the proposed projects. The need for the BA is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2):

- *“The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs (a) within an urban area; or (b) on existing infrastructure”.*

Section A of this Draft 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 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. Two site sensitivity verification assessments were undertaken for Civil Aviation and Defence, and a technical input report on traffic was also conducted.

The full specialist studies are provided in Appendix C of this Draft 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.

Two potential negative agricultural impacts have been identified. These impacts are described below and apply to the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 Facilities, and other associated infrastructure:

- 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.

In quantifying the cumulative impact, the area of land taken out of grazing as a result of the nine proposed Veroniva developments plus the other eleven renewable energy developments (total generation capacity of 4,003 MW) will amount to a total of approximately 5,097 hectares. This is calculated using the industry standards of 2.5 and 0.3 hectares per megawatt for solar and wind energy generation respectively, as per the Phase 1 Wind and Solar SEA (DEA, 2015). As a proportion of the total area within a 30 km radius (approximately 282,700 ha), this amounts to 1.80% of the surface area. That is within an acceptable limit in terms of loss of low potential agricultural land, of which there is no scarcity in the country.

The conclusion of this assessment is that the proposed development (4 x 175 MW Solar PV plus associated infrastructure) 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 Hoek Doornen PV 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.

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Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential effect of dust and noise from trucks and construction machinery during the construction period, and the effect of this on residents and visitors to the area, particularly users of the main arterial route (R356), to the site. Impact 2: Potential visual effect of haul roads, access roads, stockpiles and construction camps in the exposed landscape. 	Low risk (Level 4)	Low risk (Level 4)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential visual intrusion of solar arrays and related infrastructure and the impact on receptors, including residents and visitors, as well as game farms in the area. Impact 2: Potential visual impact of an industrial type activity on the rural or wilderness character of the area. 	Low risk (Level 4)	Low risk (Level 4)
<i>DIRECT IMPACTS - DECOMMISSIONING PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential visual effect of any remaining structures, platforms and disused roads on the landscape. 	Low risk (Level 4)	Very low risk (Level 5)
<i>CUMULATIVE IMPACTS - CONSTRUCTION PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential combined visual effect of the four solar PV facilities and associated infrastructure (i.e. Hoek Doornen PV development) with the similarly proposed Witte Wall and Grootfontein solar facilities in the study area, as well as with other nearby existing and proposed renewable energy farms in the area. 	Low risk (Level 4)	Low risk (Level 4)
<i>CUMULATIVE IMPACTS - OPERATIONAL PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential combined visual effect of the four solar PV facilities and associated infrastructure (i.e. Hoek Doornen PV development) with the similarly proposed Witte Wall and Grootfontein solar facilities in the study area, as well as with other nearby existing and proposed renewable energy farms in the area. 	Moderate risk (Level 3)	Moderate risk (Level 3)
<i>CUMULATIVE IMPACTS - DECOMMISSIONING PHASE</i>		
<ul style="list-style-type: none"> Impact 1: Potential combined visual effect of the four solar PV facilities and associated infrastructure (i.e. Hoek Doornen PV development) with the similarly proposed Witte Wall and Grootfontein solar facilities in the study area, as well as with other nearby existing and proposed renewable energy farms in the area. 	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 are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects, and 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 Hoek Doornen PV developments 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 potential impacts identified during the Palaeontology Impact Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. 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.

The potential impacts identified as part of the Terrestrial Biodiversity and Species Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. 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 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	Low risk	Low risk

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
continued disturbance across an extensive area of site	(Level 4)	(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 Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 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 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.

The potential impacts identified as part of the Aquatic Biodiversity and Species Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. 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 Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 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.

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 potential impacts identified as part of the Riverine Rabbit Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. The following impacts were identified for the construction and operational phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT AND INDIRECT IMPACTS - CONSTRUCTION PHASE</i>		
• Impact on Riverine Rabbits due to construction phase activities (i.e. Habitat loss and disturbance)	Moderate risk (Level 3)	Low risk (Level 4)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
• Impact on Riverine Rabbits due to operational phase activities (i.e. Disturbance and vehicle collisions)	Low risk (Level 4)	Low risk (Level 4)
<i>CUMULATIVE IMPACTS - OPERATIONAL PHASE</i>		
• 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 potential impacts identified during the Avifauna Impact Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. The following direct and cumulative impacts for the construction, operational and decommissioning phases were identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
DIRECT IMPACTS - CONSTRUCTION PHASE		
• Impact 1: Displacement due to disturbance associated with the construction of the solar PV plants and associated infrastructure	Moderate risk (Level 3)	Low risk (Level 4)
DIRECT IMPACTS - OPERATIONAL PHASE		
• Impact 1: Total or partial displacement of avifauna due to habitat transformation associated with the presence of the solar PV plants and associated infrastructure.	High risk (Level 2)	Moderate risk (Level 3)
• Impact 2: Mortality through collisions with the solar panels.	Very low risk (Level 5)	Very low risk (Level 5)
• Impact 3: Entrapment of medium and large terrestrial birds between the perimeter fences, leading to mortality.	Low risk (Level 4)	Very low risk (Level 5)
• Impact 4: Electrocutation of priority species on the internal 33kV power lines.	High risk (Level 2)	Very low risk (Level 5)
DIRECT IMPACTS - DECOMMISSIONING PHASE		
• Impact 1: The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area.	Moderate risk (Level 3)	Low risk (Level 4)
CUMULATIVE IMPACTS - CONSTRUCTION PHASE		
• Impact 1: Displacement due to disturbance associated with the construction of the solar PV plant and associated infrastructure	Moderate risk (Level 3)	Low risk (Level 4)
CUMULATIVE IMPACTS - OPERATIONAL PHASE		
• Impact 2: Habitat transformation, collisions with the solar panels, entrapment in fences, and electrocution on internal reticulation lines	Moderate risk (Level 3)	Low risk (Level 4)
CUMULATIVE IMPACTS - DECOMMISSIONING PHASE		
• Impact 3: The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area	Moderate risk (Level 3)	Low risk (Level 4)

It was concluded that the expected avifaunal impacts of the proposed Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 solar PV facilities and associated infrastructure 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 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 potential impacts identified during the Socio-Economic Impact Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. 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 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 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 potential impacts identified during the Geohydrology Assessment are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. The following direct impacts for the construction and operational phases were identified.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS - CONSTRUCTION PHASE</i>		
• 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)
<i>DIRECT IMPACTS - OPERATIONAL PHASE</i>		
• 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 using cleaning agents	Very low risk (Level 5)	Very low risk (Level 5)

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 I of the BA Report. The potential impacts identified in the Traffic Impact Statement are the same for the Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 projects. The impacts include the following for the construction and decommissioning phases.

Impact	Significance / Ranking (Pre-Mitigation)	Significance / Ranking (Post-Mitigation)
<i>DIRECT IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES</i>		
• 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)
<i>CUMULATIVE IMPACTS – CONSTRUCTION AND DECOMMISSIONING PHASES</i>		
• 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 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 Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 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	Moderate		Moderate		Moderate	
Socio-Economic	Very Low	Low	Insignificant and/or not identified and/or not applicable		Low	
Geohydrology	Low	Very Low	Low	Very Low	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 Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 Projects

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
CUMULATIVE NEGATIVE IMPACTS						
Visual	Low		Moderate		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	Low		Low		Low	

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
CUMULATIVE NEGATIVE IMPACTS						
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 **Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4 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 Tankwa Karoo, Ceres and Touws River regions. Provided that the specified mitigation measures are applied effectively, it is recommended that the proposed projects receive EA in terms of the EIA Regulations promulgated under the NEMA. 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, one EA will be issued for each PV Facility (i.e. a total of 4 EAs).

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 project is 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

<u>Appendix 1</u>	<u>YES / NO</u>	<u>SECTION IN BA REPORT</u>
<p>Objective of the basic assessment process</p> <p>2) The objective of the basic assessment process is to, through a consultative process-</p> <p>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;</p> <p>b) identify the alternatives considered, including the activity, location, and technology alternatives;</p> <p>c) describe the need and desirability of the proposed alternatives;</p> <p>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-</p> <p>(i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and</p> <p>(ii) the degree to which these impacts-</p> <p>(aa) can be reversed;</p> <p>(bb) may cause irreplaceable loss of resources; and</p> <p>(cc) can be avoided, managed or mitigated; and</p> <p>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-</p> <p>(i) identify and motivate a preferred site, activity and technology alternative;</p> <p>(ii) identify suitable measures to avoid, manage or mitigate identified impacts; and</p> <p>(iii) identify residual risks that need to be managed and monitored.</p>	Yes	<p>Section A of the report includes the Introduction, legislative review, alternatives assessment and needs and desirability</p> <p>Section D includes a summary of the specialist studies and associated impact assessments undertaken</p>
<p>Scope of assessment and content of basic assessment reports</p> <p>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:</p> <p>(a) details of:</p> <p>(i) the EAP who prepared the report; and</p> <p>(ii) the expertise of the EAP, including a curriculum vitae;</p>	Yes	Section A.2
<p>(b) the location of the activity, including:</p> <p>(i) the 21-digit Surveyor General code of each cadastral land parcel;</p> <p>(ii) where available, the physical address and farm name;</p> <p>(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;</p>	Yes	Section A.4
<p>(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-</p> <p>(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or</p> <p>(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;</p>	Yes	Section A.3 and Section A.4
<p>(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;</p>	Yes	Section A.5 and Section A.11
<p>(e) a description of the policy and legislative context within which the development is proposed including-</p>	Yes	Section A.10

DRAFT BASIC ASSESSMENT REPORT: Basic Assessment for the Proposed Development of four 175 MW Solar Photovoltaic (PV) Facilities and associated Infrastructure (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4), near Touws River, Western Cape

<u>Appendix 1</u>	YES / NO	<u>SECTION IN BA REPORT</u>
(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; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring;	Yes	Section D and Appendix C

DRAFT BASIC ASSESSMENT REPORT: Basic Assessment for the Proposed Development of four 175 MW Solar Photovoltaic (PV) Facilities and associated Infrastructure (i.e. Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3 and Hoek Doornen PV 4), near Touws River, Western Cape

<u>Appendix 1</u>	YES / NO	<u>SECTION IN BA REPORT</u>
(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
(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	Appendix H
(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 <i>gazetted</i> 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