

FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 4 (i.e., Padloper PV 4), as well as the proposed development of a 132 kV Overhead Power Line between the Padloper PV 4 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 4), and their associated infrastructure, near Murraysburg in the Western Cape and Northern Cape Provinces

EXECUTIVE SUMMARY

January 2024



Prepared for:
African Clean Energy Developments
(Pty) Ltd



Prepared by:
Council for Scientific and
Industrial Research (CSIR)



Executive Summary

INTRODUCTION

African Clean Energy Developments (Pty) Ltd (hereinafter referred to as the “Project Developer”) is proposing, on behalf of Padloper PV (Pty) Ltd (hereinafter referred to as “the Project Applicant”), the development of seven solar photovoltaic (PV) facilities with a capacity of between 100 and 250 MW each, seven associated 132 kV overhead power lines, and their associated infrastructure, approximately 18 km north-east of the town of Murraysburg in the Western Cape and Northern Cape Provinces (Figure A.1).

The proposed cluster of solar PV facilities, overhead power lines and their associated infrastructure are collectively referred to as the ‘Padloper Solar and EGI Cluster. The proposed cluster comprises of the following projects:

- **PROJECT 1:** Basic Assessment for the proposed development of the up to 250 MW Padloper Solar PV Facility 1 and associated infrastructure (i.e., Padloper PV 1), near Murraysburg in the Northern Cape Province
- **PROJECT 2:** Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 2 and associated infrastructure (i.e., Padloper PV 2), near Murraysburg in the Western Cape Province
- **PROJECT 3:** Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 3 and associated infrastructure (i.e., Padloper PV 3), near Murraysburg in the Western Cape Province
- **PROJECT 4:** Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 4 and associated infrastructure (i.e., Padloper PV 4), near Murraysburg in the Western Cape Province
- **PROJECT 5:** Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 5 (i.e., Padloper PV 5), the proposed development of 132 kV Electrical Grid Infrastructure between the proposed Padloper PV 4 and the proposed Padloper PV 5 (i.e., Padloper EGI 5), and their associated infrastructure, near Murraysburg in the Western Cape Province
- **PROJECT 6:** Basic Assessment for the proposed development of the up to 100 MW Padloper Solar PV Facility 6 (i.e., Padloper PV 6), the proposed development of 132 kV Electrical Grid Infrastructure between the proposed Padloper PV 4 and the proposed Padloper PV 6 (i.e., Padloper EGI 6), and their associated infrastructure, near Murraysburg in the Western Cape Province
- **PROJECT 7:** Basic Assessment for the proposed development of the up to 150 MW Padloper Solar PV Facility 7 (i.e., Padloper PV 7), the proposed development of 132 kV Electrical Grid Infrastructure between the proposed Padloper PV 4 and the proposed Padloper PV 7 (i.e., Padloper EGI 7), and their associated infrastructure, near Murraysburg in the Western Cape Province
- **PROJECT 8:** Basic Assessment for the proposed development of a 132 kV Overhead Power Line and associated Electrical Grid Infrastructure between the proposed Padloper PV 1 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 1), near Murraysburg in the Northern Cape and Western Cape Provinces

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- **PROJECT 9:** Basic Assessment for the proposed development of a 132 kV Overhead Power Line and associated Electrical Grid Infrastructure between the proposed Padloper PV 2 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 2), near Murraysburg in the Western Cape Province
- **PROJECT 10:** Basic Assessment for the proposed development of a 132 kV Overhead Power Line and associated Electrical Grid Infrastructure between the proposed Padloper PV 2 and the proposed Padloper PV 3 (i.e., Padloper EGI 3), near Murraysburg in the Western Cape Province
- **PROJECT 11:** Basic Assessment for the proposed development of a 132 kV Overhead Power Line and associated Electrical Grid Infrastructure between the proposed Padloper PV 4 and the proposed authorised Ishwati Emoyeni Collector Substation (i.e., Padloper EGI 4), near Murraysburg in the Northern Cape and Western Cape Provinces.

Project 1 is located in the Ubuntu Local Municipality and Pixley Ka Seme District Municipality in the Northern Cape province, whilst Projects 2, 7, 9, 10 will be located in the Beaufort West Local Municipality and the Central Karoo District Municipality in the Western Cape province. Projects 8 and 11 traverse both the specifically the Ubuntu Local Municipality and the Beaufort West Local Municipality in the Western Cape and Northern Cape Provinces.

The above 11 Basic Assessment (BA) Processes are being undertaken separately and have been split into two batches. Batch 1 comprises of Projects 5 – 7 whereas Batch 2 comprises of the BA Processes for Projects 1 - 4 and 8 – 11¹. The BA Processes for the projects comprising Batch 1 and Batch 2 were initiated in August 2023 and September 2023, respectively. The Final BA Reports for the projects comprising Batch 2 are currently being submitted to the National DFFE for decision-making.

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) for the projects comprising Batch 2 was discussed with the DFFE in June 2023. It was confirmed that a letter must be submitted to the DFFE to motivate for the combination and issuing of multiple EAs. In line with guidance received from the DFFE, the motivation for combination of Applications for EA and Draft BA Reports was submitted to the DFFE via email on 4 August 2023. The combined BA Reporting for each PV-EGI pair multiple EA request was approved by the DFFE on 6 September 2023. The DFFE further requested that separate Applications for EA be submitted for each PV and EGI project.

In line with the guidance and approval from the DFFE, one combined BA Report has been compiled for the each of the proposed PV-EGI pairs (i.e., Padloper PV 4 and Padloper EGI 4) comprising Batch 2 and this report includes the PV facility and the powerline environmental assessment. As requested, the BA Report is submitted with distinct and clear sections dedicated to the PV facility and EGI and separate Applications for EA for the PV facility and power line projects. Table A below indicates the proposed projects, the separate EAs that are requested for Batch 2 (should they be granted).

Note: Projects 4 and 11 (i.e., Padloper PV 4 and Padloper EGI 4) are the subject of this Draft BA Report. The EAs that are requested for these projects are outlined by a red polygon in Table A below. Separate combined Final BA Reports for the remaining 3 PV-EGI pairs have been prepared and are being submitted concurrently.

¹ Approval to proceed with this phased release approach was granted during the pre-application meeting undertaken with the DFFE on 9 June 2023. Refer to Appendix G.3 of this BA Report for a copy of the approved minutes from the pre-application meeting.

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Table A: Approved BA Reporting Structure and Components

No.	Project No. (Short title)	Applicant	No. of Applications for EA	No. of BA/EIA Reports	No. of EAs
1	PROJECT 1 (i.e., Padloper PV 1 and associated infrastructure)	Padloper PV (Pty) Ltd	1 x Application for EA	1 Combined BA Report	1 EA
2	PROJECT 8 (i.e., Padloper EGI 1 and associated infrastructure)		1 x Application for EA		1 EA
3	PROJECT 2 (i.e., Padloper PV 2 and associated infrastructure) **		1 x Application for EA	1 Combined BA Report	1 EA
4	PROJECT 9 (i.e., Padloper EGI 2 and associated infrastructure) **		1 x Application for EA		1 EA
5	PROJECT 3 (i.e., Padloper PV 3 and associated infrastructure)		1 x Application for EA	1 Combined BA Report	1 EA
6	PROJECT 10 (i.e., Padloper EGI 3 and associated infrastructure)		1 x Application for EA		1 EA
7	PROJECT 4 (i.e., Padloper PV 4 and associated infrastructure) **		1 x Application for EA	1 Combined BA Report	1 EA
8	PROJECT 11 (Padloper EGI 4 and associated infrastructure) **		1 x Application for EA		1 EA
Total			8 separate Applications for EA	4 BA Reports	8 EAs

** Subject of this BA Report

The proposed Padloper PV 4 site and majority of Padloper EGI 4 servitude are located within the Renewable Energy Development Zone 11 (i.e., Beaufort West REDZ), one of the eleven REDZs formally gazetted in South Africa for the purpose of developing solar PV and wind energy generation facilities (Government Gazette 41445, Government Notice (GN) 114; 16 February 2018 and GN 144; 26 February 2021). Refer to Figure A for the locality of the proposed projects in relation to the REDZs. In addition, the proposed Padloper PV 4 site and majority of Padloper EGI 4 servitude are located within the Central Strategic Transmission Corridor, one of the five EGI Power Corridors formally gazetted for implementation on 16 February 2018 in Government Gazette 41445, GN 113 and an additional two expanded corridors gazetted on 29 April 2021 in GN 383.

In line with the gazetted process for projects located within a REDZ, the proposed project is subject to a 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) is therefore being undertaken for the proposed projects.

Section A.11 of this BA Report contains the detailed list of activities contained in R327, R325, and R324, as amended, which may be triggered by the various project components and thus form part of the BA Process.

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An integrated PPP has been undertaken for the BA Processes (i.e., Padloper PV and EGI 1-4).

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 **26 September to 26 October 2023**, excluding public holiday. All comments pertaining to proposed Padloper PV 4 project, that were submitted during the 30-day review period have been captured and addressed in the detailed Comments and Responses Report (CRR) (Part C.1 of this BA Report). All comments pertaining to proposed Padloper EGI 4 project, that were submitted during the 30-day review period have been captured and addressed in a separate detailed Comments and Responses Report (CRR) (Part C.2 of this BA Report). Refer to Appendix F.10 of this BA Report for copies of correspondence received from I&APs and Organs of State during the 30-day comment period.

PROJECT LOCATION

The locality of the proposed Padloper PV 4 and Padloper EGI 4 projects are shown below in Figure A. The co-ordinates of the proposed project sites are detailed in Section A of this BA Report.

Proposed Padloper Solar Photovoltaic (PV) and Electricity Grid Infrastructure (EGI) cluster near Murraysburg, in the Western Cape and Northern Cape, South Africa

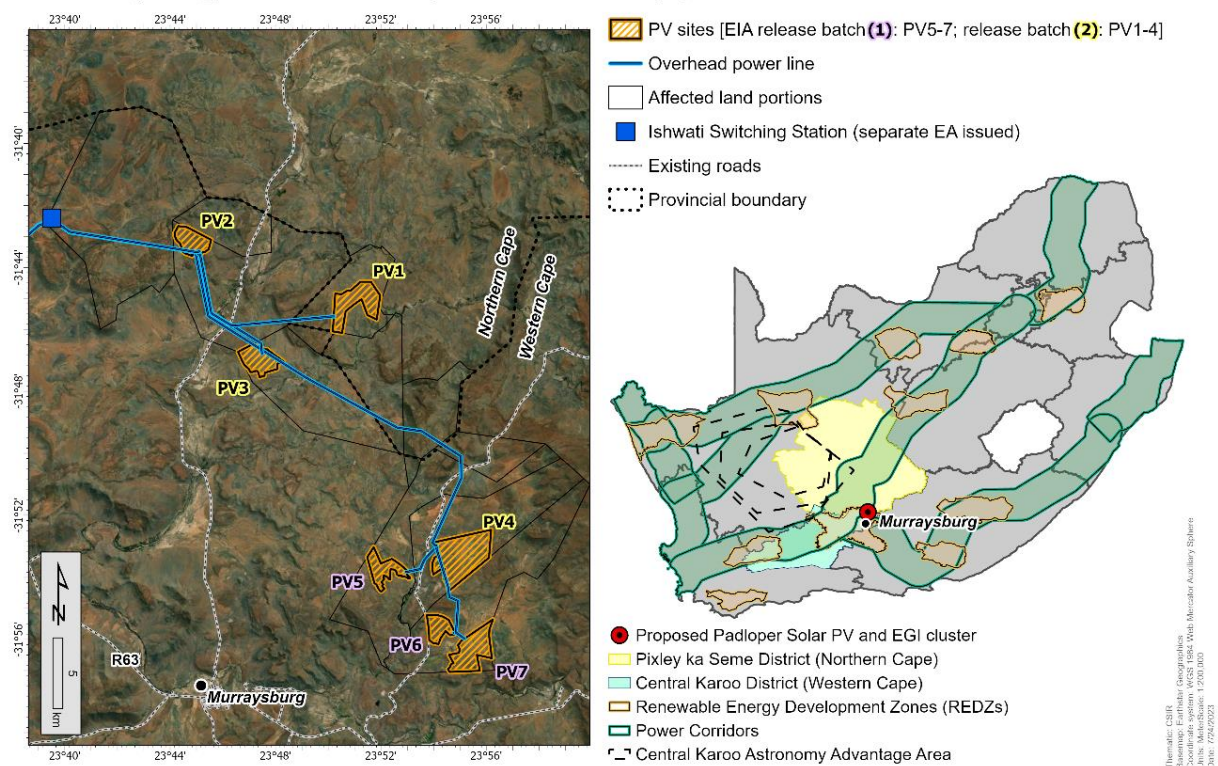


Figure A. Locality of the proposed Padloper Solar and EGI Cluster and the phased approach of the Basic Assessment Processes.

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

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with undertaking the proposed development. The project team, including the relevant specialists, is indicated in Table B below.

Table B. Project Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	EAP and Project Leader
Dhiveshni Moodley (<i>Cand.Sci.Nat.</i>)	CSIR	Project Manager
Helen Antonopoulos	CSIR	Project Officer
Luanita Snyman-van der Walt (<i>Pr.Sci.Nat.</i>)	CSIR	Project Mapping
Phindile Mthembu	CSIR	Project Officer
Specialists		
Johann Lanz	Private	Agricultural Compliance Statement
Kerry Schwartz	SLR Consulting	Visual Impact Assessment
Jayson Orton	ASHA Consulting	Heritage Impact Assessment (Archaeology, Cultural Landscape)
Elize Butler	Banzai Environmental	Palaeontology Impact Assessment
Brian Colloty	Enviro-Sci	Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species
Brian Colloty	Enviro-Sci	Aquatic Biodiversity and Species Impact Assessment
Anja Albertyn	Holland & Associates Environmental Consultants	Avifauna Impact Assessment
Hugo van Zyl and James Kinghorn	Independent Economic Researchers	Socio-Economic Impact Assessment (only undertaken for the PV component)
Debbie Mitchell	Ishecon	BESS Risk Assessment (only undertaken for the PV component)
Ntuthuko Hlanguza	SiVEST	Traffic Impact Assessment (only undertaken for the PV component)
Hardy Luttig, Dale Barrow and Shane Teek	GEOSS South Africa (Pty) Ltd	Geohydrology Assessment (only undertaken for the PV component)
Hardy Luttig and Shane Teek		Desktop Geotechnical Assessment (only undertaken for the PV component)
Lizande Kellerman, Dhiveshni Moodley, Helen Antonopoulos, Luanita Snyman-van der Walt and Minnelise Levendal (ex CSIR employee)	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman, Dhiveshni Moodley, Helen Antonopoulos, Luanita Snyman-van der Walt and Minnelise Levendal (ex CSIR employee)	CSIR	Defence Site Sensitivity Verification

PROJECT DESCRIPTION

The proposed Padloper PV 4 will have a capacity of up to 150 MW. The associated infrastructure includes various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, an on-site substation, and a Battery Energy Storage Systems (BESS). The proposed Padloper EGI 4 project comprises of an on-site switching substation and a 132 kV power line extending from the on-site switching substation at the proposed Padloper PV 4 to the proposed authorised Ishwati Emoyeni Collector Substation.

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The proposed Solar PV facility 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 Gamma Main transmission Station (MTS) via the proposed Padloper EGI 4 and the proposed authorised Ishwati Emoyeni Collector Substation. The locality and layout of the proposed projects are depicted in Figure B below.

It is important to note at the outset that the exact specifications of the project components will be determined during the detailed engineering phase (subsequent to the issuing of EAs, should such authorisations be granted for the proposed projects) but that the information provided below is seen as the worst-case scenario for the project. The information presented in Table C applies to the proposed Padloper PV 4 project and Table D applies to the Padloper EGI 4 project.

Proposed Padloper Solar Photovoltaic (PV) and Electricity Grid Infrastructure (EGI) cluster near Murraysburg, in the Western Cape and Northern Cape, South Africa

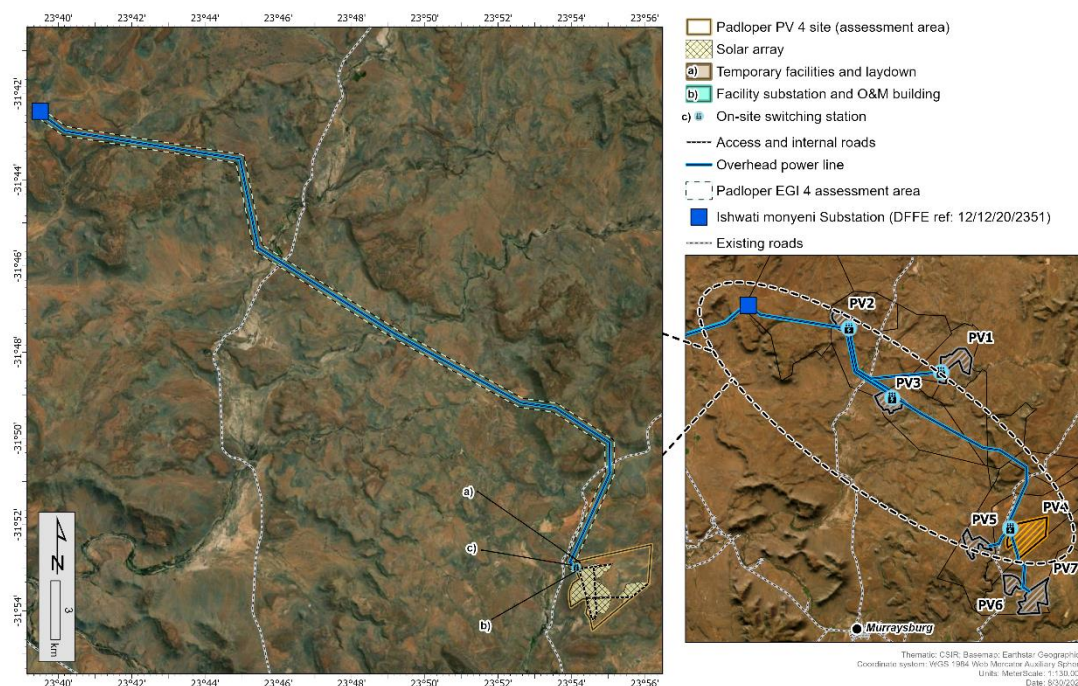


Figure B. Locality of the Proposed PV and EGI Projects

Table C. Description of the Project Components

Component	Dimensions / Specifications
Solar PV	
Type of Technology	<ul style="list-style-type: none"> Solar Photovoltaic (PV) Technology
Height of PV panels	<ul style="list-style-type: none"> Maximum of ± 4.5 m
Capacity of the PV Facility	<ul style="list-style-type: none"> Up to 150 MW
Area of PV Array (i.e., proposed area occupied by PV Modules)	<ul style="list-style-type: none"> 328 hectares Note: The permanent fence line will run as close as possible to the solar array demarcation and substation area. Therefore, the PV array area and the total fenced area (i.e., the area that includes all associated infrastructure within the fenced off area of the PV facility) is anticipated to be similar.
Technology mounting structure	<ul style="list-style-type: none"> The following technologies are being considered:

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Component	Dimensions / Specifications
	<ul style="list-style-type: none"> • Single Axis Tracking structures (aligned north-south); • Dual Axis Tracking (aligned east-west and north-south); • Fixed Tilt Mounting Structure; • Mono-facial Solar Modules; or • Bifacial Solar Modules.
Inverter-transformer stations	<ul style="list-style-type: none"> • 3.5 MW inverters will be located across the proposed project. The exact number of inverters are still to be confirmed however all inverter-transformers will be within the PV array. • Area occupied by stations: 0.022 ha each • Height: The inverter stations will have a height of ± 3 m each (Excluding lightning rods. The lightning rods are expected to extend 10 m high. Each inverter station will have 1 – 2 lightning rods).
Associated infrastructure	
Temporary Construction and Laydown area	<ul style="list-style-type: none"> • Area: 1 - 4 ha • Note: These areas will be rehabilitated after construction and will not be retained for the Operational phase.
Main access roads	<ul style="list-style-type: none"> • Width: 5 m • Length: Approximately 0.57 km • Note: The existing road network will be used as far as practically possible and upgraded as needed.
Internal access roads	<ul style="list-style-type: none"> • Width: 5 m • Length: Approximately 9.34 km of internal roads – in order for security patrols and to access all the equipment (module cleaning and equipment maintenance). • Please note: The existing road network will be used as far as practically possible and upgraded as needed.
Upgrading of existing access road/s (Yes/No)	<ul style="list-style-type: none"> • Yes. Existing roads will be used as far as practically achievable. • Current width (m): ± 5 m • Upgraded width (m): ± 8 m (6 m wide road surface with 1 m drain either side) • Please note: Where required for turning circle/bypass areas access or internal roads may be up to 10 m to allow for larger component transport.
Internal transmission and/or distribution lines	<ul style="list-style-type: none"> • All on-site medium voltage cabling (22 or 33 kV) will be buried to a maximum depth of 1.5 m.
Site offices Including a warehouse/workshop and an operational and maintenance (O&M) control centre. The details provided in this section is for one site office.	<ul style="list-style-type: none"> • Site offices and an O&M control centre will be located in one building. The workshop and storage area may be attached to the O&M control centre. All buildings will be located within the O&M complex/footprint • Maximum height: Up to 10 m • Footprint: 300 m²
Guard houses	<ul style="list-style-type: none"> • Maximum height: Up to 3 m • Footprint: ± 6 m x 6 m (i.e., ± 36 m²) • Note: There will be 2 guardhouses at the proposed project site. The details provided in this section is for one guard house.
Ablution facilities and staff lockers	<ul style="list-style-type: none"> • Maximum height: Up to 10 m • Footprint: ± 22 m x 11 m (± 242 m²) • Note: There will be 2 ablution facilities proposed project site, included in site offices and guardhouse footprints. The details provided in this section is for one ablution facility.
Battery energy storage system (BESS)	<ul style="list-style-type: none"> • Technology types considered: Lithium-Ion, Sodium-Ion, Solid State and Redox Flow technology • Footprint: ± 5 ha • Height: Maximum height of 10 m

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Component	Dimensions / Specifications
	<ul style="list-style-type: none"> Capacity: 900 MWh
On-site facility substation	<ul style="list-style-type: none"> Capacity: 132 kV Area: Up to 2 ha Maximum height: Up to 18 m Note: The facility substation complex will be located within the solar PV site.
On site medium voltage cables or cable trays	<ul style="list-style-type: none"> Depth: Maximum depth of 1.5 m Capacity: 22 or 33 kV
Water use requirements	<ul style="list-style-type: none"> Estimated quantity of water (litres) required for the construction phase: Up to 30 000 m³ per annum. Estimated quantity of water (litres) required for the operational phase: Up to 8 000 m³ per annum. Estimated quantity of water (litres) required for the decommissioning phase: The exact amount of water required during this phase is unknown at this stage but expected to be similar to that of the construction phase.
Construction period	<ul style="list-style-type: none"> < 24 months

Table D. Description of the Project Components

Component	Dimensions / Specifications						
Overhead power line							
Capacity	<ul style="list-style-type: none"> 132 kV 						
Foundation	<ul style="list-style-type: none"> The size of the footprint area will range from 0.6 m x 0.6 m to 1.5 m x 1.5 m. The minimum working area required around a structure position is 20 m x 20 m. 						
Pylon	<ul style="list-style-type: none"> Steel monopole or lattice towers 						
Tower type	<ul style="list-style-type: none"> Self-supporting and Angle Strain towers 						
Height	<ul style="list-style-type: none"> 17.4 m – 21 m 						
Servitude length	<ul style="list-style-type: none"> Approximately 36.5 km 						
Servitude width	<ul style="list-style-type: none"> Assessed servitude width: 400 m wide corridor (i.e., 200 m on either side of center line) was assessed by specialists, in order to identify sensitivities and features that need to be avoided. Registered servitude will be up to 50 m wide or where multiple adjacent power lines occur, in line with guideline and requirements for 132 kV power lines stipulated in the 2011 Eskom Distribution Guide Part 19. <p>Guideline and requirements for 132 kV power lines (Extracted from Eskom Distribution Guide Part 19, 2011)</p> <table border="1" data-bbox="434 1550 1489 1680"> <thead> <tr> <th>Voltage</th> <th>Building restriction on each side of centre line</th> <th>Separation distance between parallel lines</th> </tr> </thead> <tbody> <tr> <td>132 kV</td> <td>18 metres (15.5 - 20)</td> <td>15 metres (21 - 24)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Note: The entire servitude will not be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications. 	Voltage	Building restriction on each side of centre line	Separation distance between parallel lines	132 kV	18 metres (15.5 - 20)	15 metres (21 - 24)
Voltage	Building restriction on each side of centre line	Separation distance between parallel lines					
132 kV	18 metres (15.5 - 20)	15 metres (21 - 24)					
Proximity to grid connection	<ul style="list-style-type: none"> The proposed 132 kV overhead power line will facilitate the connection of the proposed Padloper PV 4 to the existing Gamma MTS, via the authorised Ishwati Emoyeni Collector Substation. 						
Associated infrastructure							
Service roads	<ul style="list-style-type: none"> It is anticipated that a service road of approximately 4 m wide (usually only jeep tracks) below the power line will be required. There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 5 m located around and within the proposed power line 						

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Component	Dimensions / Specifications
	assessment corridor. Surrounding existing farm tracks may also be utilised where needed pending agreements with landowners.
Switching station	<ul style="list-style-type: none"> A 132 kV facility switching substation complex will be located within the site, adjacent to the facility substation, and will have a height of up to 18 m. The area of switching stations relevant to the proposed power lines is approximately 2.17 ha.
Construction period	<ul style="list-style-type: none"> Approximately 18-24 months

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 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”.*

The need for the BA for the EGI project is triggered by, amongst others, the inclusion of Activity 9 listed in GN R325 (Listing Notice 2)²:

- *“The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex 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”.*

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 the proposed project, if implemented, may have on the receiving environment. The BA therefore needs to show the Competent Authority, the DFFE; and the project proponent, Padloper PV (Pty) Ltd, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic

² Specialists' findings for several sensitivity themes confirmed that the proposed power line route traverses' areas of 'High' and 'Very high' Sensitivity. Refer to Section A.12 of this BA Report and Appendix 7 of the amended EA Application form for further details. Considering the above, and in conjunction with feedback and confirmation obtained during the second pre-application meeting which took place on 9 June 2023 (Reference number: **2023-05-0032**) as well as the approval of the combination request from the DFFE (Reference number: **14/12/16/3/1/1/217**), it is the EAP's understanding that the EGI Standard is not applicable to the proposed project. As such, one combined Basic Assessment Report has been prepared and submitted for the Padloper PV-EGI pair in line with GN 145.

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environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

IMPACT ASSESSMENT

Full specialist studies are provided in Appendix D of this 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 Statements were undertaken by Johann Lanz to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statements are included in Appendix D. 1 of the BA report.

Two main potential negative agricultural impacts, which are applicable to the PV project have been identified. These impacts are described below:

- **Occupation of land** - Agricultural land directly occupied by the development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. However, the Agriculture and Soils Study notes that the production potential of that land is limited to only being suitable as low carrying capacity grazing land. The loss of such land, of which there is no scarcity in the country, represents a minimal loss of agricultural production potential in terms of national food security and for the affected farm.
- **Soil erosion and degradation** – Erosion can occur as a result of the alteration of the land surface run-off characteristics, predominantly through the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Soil erosion and loss of topsoil are completely preventable. The stormwater management that will be an inherent part of the engineering on site and standard, best-practice erosion control and topsoil management measures recommended and included in the EMPr, are likely to be effective in preventing soil erosion and loss of topsoil.

The only potential source of impact of the power line is minimal disturbance to the land (erosion and topsoil loss) during construction (and decommissioning). This impact can be completely prevented with standard, generic mitigation measures that are all inherent in the project engineering and/or are standard, best-practice for construction sites, and are included in the EMPr.

In quantifying the cumulative impact, the area of land taken out of agricultural use as a result of all the projects considered in the cumulative impact assessment (total generation capacity of 2789 MW) will amount to a total of approximately 4687 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 Department of Environmental Affairs (DEA) Phase 1 Wind and Solar Strategic Environmental Assessment (SEA) (2015). As a proportion of the total area within a 30 km radius (approximately 282,700 ha), this amounts to only 1.66% of the surface area. This is within an acceptable limit in terms of loss of low potential agricultural land, which is only suitable for grazing, and of which there is no scarcity in the country.

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The conclusion of these assessments is that the proposed developments will not have an unacceptable negative impact on the agricultural production capability of the site. The proposed PV and EGI developments are therefore acceptable.

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

Visual Impact Assessment

The Visual Impact Assessments (refer to Appendix D.2) were undertaken by Kerry Schwartz to inform the outcome of this BA from a visual perspective.

A broad-scale assessment of visual sensitivity, based on the physical characteristics of the study area, economic activities and land use that predominates, determined that the area would have a moderate visual sensitivity. An important factor contributing to the visual sensitivity of an area is the presence, or absence of visual receptors that may value the aesthetic quality of the landscape and depend on it to produce revenue and create jobs. No formal protected areas and relatively few sensitive or potentially sensitive receptor locations were identified in the study area, thus confirming the moderate level of visual sensitivity.

Padloper PV 4

The assessment identified zones of potential visual sensitivity relevant to the proposed development. These zones included areas of higher elevation as well as a 500 m buffer around a homestead on the affected farm portion as well as a 300 m buffer along the Secondary Road that traverses the affected farm portion. The PV Array Area for Padloper PV 4 has almost entirely avoided these areas. The assessment noted that the array area has however extended up onto what appears to be a small hilltop in the potentially sensitive zone, although this is not seen as a fatal flaw. Aside from the fact that these zones are not viewed as “no-go” areas, the assessment confirmed that the PV Arrays are only expected to be marginally visible from the nearest potentially sensitive receptor locations. In consideration of the potential landscape impacts, it is however recommended that PV arrays located in this zone are positioned away from the western edge of the plateau to reduce any potential impacts on the skyline. In addition, development on the steeper slopes leading up to the hilltop should be avoided.

Overall, the assessment identified thirteen potentially sensitive visual receptor locations within the combined study area. None of the identified receptor locations are expected to experience high levels of visual impact as a result of the PV project. In addition, none of the roads within the study area (i.e., R63, MR607 and DR204) are specifically valued or utilised for their scenic or tourism potential and are therefore not regarded as visually sensitive.

It was therefore concluded that the potential visual impacts associated with the proposed project is negative and of moderate significance. Given the low level of human habitation and the relatively low number of sensitive and potentially sensitive receptor locations however, the project is deemed acceptable from a visual perspective and the EA should be granted.

Considering all factors, it is recommended that the development of the facility as proposed be supported; subject to the implementation of the recommended mitigation measures.

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Padloper EGI 4

The assessment found that the power line route alignment for Padloper EGI 4 traverses higher-lying plateaus as well as the flatter, lower lying areas associated with the river valleys. Although, sections of the power line route are expected to have a significant impact on the skyline, topographic variations in the surrounding area are sufficient to limit views of the EGI from significant parts of the study area and the powerline will be partially visible from three sensitive receptor locations in the study area and three potentially sensitive receptors.

Overall, none of the identified receptor locations are expected to experience high levels of visual impact as a result of the EGI project.

Considering all factors, it is recommended that the development of the facility as proposed be supported, subject to the implementation of the recommended mitigation measures.

Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by Jayson Orton to inform the outcome of this BA from an archaeology and cultural heritage and landscape perspective. Separate integrated Heritage Impact Assessments for the proposed PV and EGI projects containing Archaeology, Cultural Landscape and Palaeontology were undertaken. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape. The complete Heritage Impact Assessments are included in Appendix D.3 of this BA Report.

Padloper PV 4

The detailed Heritage Impact Assessment concluded there are no significant archaeological concerns for this project since no archaeological sites are under threat and no other heritage resources will be significantly impacted. Several archaeological sites were of concern, but all have been avoided by the proposed footprint.

The assessment found that historical archaeological resources were strongly focused on land surrounding the historical farmstead. The wider site includes a variety of features scattered over an area measuring about 750 m by 250 m. The site includes ruins, kraals, ash and rubbish middens and many graves. In addition, a small cairn of rocks whose function could not be determined was noted (marked as waypoint 202). In terms of cultural landscape, the assessment noted that the proposed PV facility is located at least 450 m from the nearest public road however should only be partially visible in the landscape due to the local topography and only edge-on as it will be at an elevation some 10 m (in the northwest) to 50 m (in the southwest) higher than the road. The assessment however did not note the proposed array area extends onto a hill which will result in a more significant alteration of the skyline than would be the case on flat terrain. As such, the facility may result in a moderate degree of change to the local sense of place, as the proposed location of the substation is proposed near the edge of the escarpment and could be reasonably prominently visible, though still quite far away. The assessment concluded that the facility will generally not be highly prominent in the landscape because of the lack of publicly accessible top-down views and the generally undulating nature of the wider area.

Overall, the detailed Heritage Impact Assessment concluded that there are no significant archaeological concerns for proposed PV project since no archaeological sites are under threat and no other heritage resources will be significantly impacted.

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The assessment concluded that given the overall low sensitivity of the study area - the lack of impacts to heritage resources, the heritage specialist is of the opinion that the proposed Padloper PV 4 may be authorised in full but subject to recommendations which should be included as conditions of authorisation and contained in the EMPr (Refer to Section E of this BA Report) as well as consideration of the recommendations to mitigate the potential impacts to the skyline.

Padloper EGI 4

The assessment concluded that all known sites have been avoided by the proposed route alignment, including those at the archaeological Driefontein farmstead, although the power line would run over some historical dams, this is not seen as a fatal flaw.

The assessment noted that the proposed power line servitude traverses two cultural landscape areas i.e., the southern end of the Riet Poort farmstead and the middle of the Bakenslip farmstead. The assessment concluded that the crossing at the Riet Poort farmstead is not of concern considering the distance of the power line from the farmhouse. The assessment further noted that the crossing through the Bakenslip farmstead is not ideal however the power line has been aligned to run parallel to the proposed authorized power lines connecting the Umsinde Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/686), Khangela Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/687) and the Ishwati Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/410 - 411) to Gamma MTS in order to consolidate the disturbance corridor in the landscape.

The assessment noted that the proposed power line traverses the farm portions on which the Rietpoort farmstead (i.e., a cultural landscape area) is located, however the crossing does not occur in close proximity to the farmstead and as such is not of concern. The power line also traverses farm portions on which the Bakenslip farmstead (i.e., a cultural landscape area) is located. This crossing occurs in close proximity to the farmstead. However, the assessment acknowledged that the proposed power line has been aligned to run parallel to the proposed authorised power lines connecting the Umsinde Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/686), Khangela Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/687) and the Ishwati Emoyeni WEF (DFFE Ref: 14/12/16/3/3/2/410 - 411) to Gamma MTS in order to consolidate the disturbance corridor in the landscape. Therefore, the current routing of the Padloper EGI 4 power line and clustering of the proposed authorised power lines is preferred and will have a reduced landscape impact than if clustering of the power lines was not applied.

The assessment concluded that given the generally low sensitivity of the proposed route and the ease with which any remaining impacts are expected to be managed or mitigated, the heritage specialist is of the opinion that the proposed Padloper EGI 4 may be authorised in full but subject to recommendations which should be included as conditions of authorisation and contained in the EMPr (Refer to Section E of this BA Report).

Palaeontology Impact Assessment

The Palaeontology Impact Assessment was undertaken by Elize Butler 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 projects. However, for ease of reference, this section only deals with the Palaeontology. The complete integrated Heritage Impact Assessments are included in Appendix D.3 of this BA Report.

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Padloper PV 4 and EGI 4

Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the overall development footprint (PV facility and overhead power line 400 m corridor) is rare. A medium Palaeontological Significance has been allocated for the construction phase of the PV and power line developments pre-mitigation and a low significance post mitigation.

It is therefore considered that the proposed developments will not lead to damaging impacts on the palaeontological resources of the area. The construction of the developments may thus be permitted in its whole extent, as the development footprints are not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.

However, the study also notes that the proposed project is mostly underlain by the Balfour Formation (Adelaide Subgroup, Beaufort Group, Karoo Supergroup) with a small portion underlain by Jurassic Dolerite. It is further explained that the Balfour Formation (Adelaide Subgroup, Beaufort Group, Karoo Supergroup) has a Very High Palaeontological Sensitivity. Therefore, the Environmental Control Office/designated responsible person for this project, must constantly monitor Balfour Formation area during surface clearance and construction. If Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance find Protocol attached should be implemented immediately.

The impact on the palaeontological heritage would be low pre-mitigation and very low post-mitigation (removal of fossils if they are found in the footprint), so as far as the palaeontology is concerned, the project should be authorised for proposed projects.

Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity and Species Assessments (refer to Appendix D.4) were undertaken by Brian Colloty to inform the outcome of this BA from a terrestrial biodiversity and species perspective.

Padloper PV 4

The assessment confirmed that the site contains areas identified as CBA 1, CBA2 and ESA 2 associated with the main stem rivers and or terrestrial environments within the region. The habitat associated with these areas, or habitat functions (habitats for the sensitive plant and animal species listed, catchments and or water courses (ESAs) was mapped and have been avoided by the proposed development.

The nature of the project is such that it carries a low to moderate intensity impact on terrestrial resources, with highest number of impacts being associated creation of PV panel areas, roads, installation of cables and other infrastructures across the site. The project areas are however small, allowing for retention of much of the natural area so the ecosystems should remain largely unaffected. This is largely based on the assumption that all Very High sensitivity habitats can be avoided, through the use of the existing tracks and roads shown in this assessment.

In conclusion, most of the anticipated impacts will include disturbance during the construction phase, while changes to form and function of the site will be limited in the operational phase, and it is anticipated that all these would be Very Low post mitigation.

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Based on the findings of this study, the specialist finds no reason to withhold an authorisation of any of the proposed activities, assuming that the key recommended mitigations measures are implemented.

Padloper EGI 4

The assessment confirmed that the grid corridor traverses CBA 1, CBA2, ESA 2 and NFEPA catchments (associated with the main stem rivers) and or terrestrial environments within the region. The habitats associated with these areas, or habitat functions (habitats for the sensitive plant and animal species listed, important water courses (CBAs) were mapped to a fine scale level and have been avoided by the proposed development in some cases spanning watercourses and or ridges (rocky outcrops and inselbergs).

The proposed project carries a low to moderate intensity negative impact on terrestrial resources, with highest number of impacts being associated with the installation of the power line and switching station. The project area is however small, allowing for retention of much of the natural area so the ecosystems should remain largely unaffected. This is largely based on the assumption that all Very High Sensitivity habitats can be avoided, using the existing tracks and roads shown in this assessment or where possible spanned by the power line.

The assessment concluded that most of the anticipated impacts will include disturbance during the construction phase, while changes to form and function of the site will be limited in the operational and maintenance (O&M) phase, and it is anticipated that all these would be Very Low post mitigation implementation.

Based on the findings of this study, the specialist finds no reason to withhold an authorisation of any of the proposed activities, assuming that the key recommended mitigations measures are implemented.

Aquatic Biodiversity and Species Impact Assessment

The Aquatic Biodiversity Assessments were undertaken by Brian Colloty to inform the outcome of this BA from an aquatic biodiversity perspective. The complete Aquatic Biodiversity and Species Assessments are included in Appendix D.5 of this BA Report.

Padloper PV 4 and Padloper EGI 4

The PV site was earmarked as having potential CBA 1, CBA 2 and ESA 2 associated with the main stem rivers within the region. Whilst the power line corridor was earmarked as having potential CBA 1 aquatic, ESA 1 aquatic, FEPA Catchments, associated with the main stem rivers within the region. Based on the site observation, the habitat associated with these areas, or habitat functions (important catchments and or water courses were then mapped to a fine scale level as thus indicated as No-go (Very High) for the site. The proposed layout and power line routing has thus avoided these areas.

The outcomes of the risk assessment indicate minor impacts from the proposed activities for the Padloper PV 4 and Padloper EGI 4 projects. A variety of aquatic features, mostly ephemeral in nature were identified within the PV study area and power line assessment corridor and, where required, the PV layout and power line route alignment has taken some cognisance of these features by selecting areas that have already been impacted. On these grounds the current overall impact on the aquatic environment for the Padloper PV 4 and Padloper EGI 4 projects is Very Low (with mitigation).

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Based on the findings of this study, the specialist finds no reason to withhold an authorisation of any of the proposed activities for both of the projects, assuming that the key recommended mitigations measures are implemented.

Avifauna Assessment

The Avifauna Impact Assessments were undertaken by Anja Albertyn to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessments are included in Appendix D.6 of this BA Report.

Padloper PV 4

The Site Ecological Importance rating of medium indicates that the PV site is potentially suitable for development if minimisation and restoration mitigation are implemented. Impacts of medium negative impact significance are acceptable, if followed by restoration activities (SANBI 2022).

The assessment found that approximately 158 ha Critical Biodiversity Area (CBA) 1 and CBA 2 areas occur within the site and are of medium avifaunal sensitivity and recommended that development should be avoided within these areas as much as possible. The assessment confirmed that this has been achieved by the proposed layout which covers an area of only approximately 11 ha of CBA 1 and less than 3 ha of CBA 2, which is considered acceptable avoidance and minimisation mitigation.

The impact assessment has identified potential impacts to avian species, most of which can be mitigated to a very low or low negative level. No residual impacts of high significance were identified for the proposed development. The assessment concluded that the proposed development site avoids all areas identified as of high sensitivity during pre-application monitoring and is considered the preferred alternative site from an avifaunal perspective. The access road follows an existing farm road over its entire length and is also considered the best alternative location from an avifaunal perspective.

Due to the footprint of the proposed development, approximately 328 ha of potential SCC habitat would be lost, and even with mitigation this impact is expected to be of medium negative significance for the SCCs that occur here (confirmed or high probability of occurrence). These are Blue Crane, Karoo Korhaan, Ludwig's Bustard, Lanner Falcon, Martial Eagle, and Verreaux's Eagle. However, due to these species having much surrounding equivalent habitat available, this loss of habitat is not deemed to have unacceptably high impacts on these species if the recommended mitigation measures are implemented.

Based on the results of the assessment, the proposed development is deemed acceptable from an avifaunal perspective, if all of the above mitigation measures are included for implementation in the EMP.

Padloper EGI 4

The Padloper EGI 4 corridor traverses four NFEPA rivers and twelve NFEPA wetlands are located within the corridor. As such, an area of 200 m around the rivers and 100 m around the wetlands were identified as being of medium avifaunal sensitivity and should be avoided by the alignment where possible, and the placement of pylons located as far outside of these areas as practically possible.

The assessment also recorded a stand of alien trees in which two medium-sized stick nests were found is located within the corridor. A 250 m area surrounding the nests is considered to be of medium avifaunal sensitivity and construction activities may be limited in these areas during the breeding period if the nests are active and depending on the species nesting.

Overall, the impact assessment has identified potential impacts to avian species, most of which can be mitigated to a very low or low negative level. No residual impacts of high significance were identified for

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the proposed development. The main negative impact of the proposed development is collisions with the power line, which is difficult to mitigate for Ludwig's Bustard. Therefore, the impact significance rating with mitigation remains of moderate negative significance.

The combined Site Ecological Importance rating of medium indicates that with minimisation and restoration mitigation, development activities with medium impact are acceptable if followed by appropriate restoration activities. The proposed development can therefore be mitigated to an acceptable level of impact.

Based on the results of the assessment, the proposed development is deemed acceptable from an avifaunal perspective, if all of the above mitigation measures are included for implementation in the EMPr.

Socio-Economic Assessment

The Socio-Economic Assessment (refer to Appendix D.7) was undertaken by Hugo van Zyl and James Kinghorn to inform the outcome of this BA from a socio-economic perspective.

The assessment found that the project is not free of commercial risk nor would it be realistic to expect this. However, the balance between financial benefits and costs are likely to be positive for the applicant and landowner partners, barring unforeseen risks. In term of wider positive impacts, the project would be largely supportive of local and regional socio-economic development and energy supply planning imperatives including the diversification of the economy and energy sources.

Negative impacts would primarily arise at a local scale. It is anticipated that, with mitigation, the risks posed to the community by the influx of people, including job seekers, would be manageable and of a low significance with mitigation. Tourism facilities and attractions in the areas surrounding the project site are relatively limited and sparsely distributed. The tourism context combined with likely visual and associated heritage impacts in a landscape with scenic qualities should limit tourism impacts to a low significance during both construction and operations with mitigation. Impacts on surrounding landowners and communities, including to their sense of place, are expected to be low negative with mitigation during construction and operations.

In conclusion the assessment noted that it is considered most likely that the combined positive impacts of the project would exceed its negative impacts resulting in an overall net benefit with mitigation. The project is therefore all deemed acceptable in terms of socio-economic impacts and should be allowed to proceed.

Geohydrology Assessment

The Geohydrology Assessment (refer to Appendix D.9) was undertaken by Hardy Luttig and Shane Teek to inform the outcome of this BA from a geohydrological perspective.

The study notes that it is anticipated that the underlying aquifers will be able to deliver the requisite cumulative demands during the construction (22100 000 m³/a) and operational (5745 000 m³/a) phases, for each of the proposed developments comprising the Padloper PV and EGI Cluster, i.e., Padloper PV 1-7. The impact of the proposed Padloper PV 4 is anticipated to be low in terms of groundwater quality and groundwater availability.

Further, the cumulative water demands of the proposed Padloper Solar PV Development are anticipated to be low in terms of groundwater availability and quality. However, the needs of the

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neighbouring developments and farm owners/ landowners will also need to be established to ensure sustainable groundwater abstraction.

Instatement of an appropriate groundwater monitoring plan is paramount to ensure sustainable and responsible management of the groundwater reserves in the region. A quarterly groundwater monitoring programme should be instated to ensure that no groundwater contamination takes place during the construction or decommissioning phases of this development. Further, monitoring would serve to ensure that the water use is lawful and confirm that impacts of abstraction on the regional aquifer(s) is negligible.

Therefore, it is supported that the project can progress as is, as long as the recommended mitigation measures are implemented.

Desktop Geotechnical Assessment

The Geotechnical Assessment (refer to Appendix D.10) was undertaken by Hardy Luttig and Shane Teek to inform the outcome of this BA from a geotechnical perspective.

The potential impact of the proposed development during the construction, operational and decommissioning phases of the projects is expected to be very low (post-mitigation) and is anticipated to have little effect on the site from a geotechnical point of view. Increased soil erosion may transpire as an impact of development, this may persist for the life of the project. However, the impact of this is expected to be very low and is anticipated to have little effect on the site from a geotechnical point of view. The study notes that variable soil and rock conditions will exist across the site. It is anticipated that conventional foundations can be employed for all structures. Karoo mudrock and sandstone should be avoided when selecting aggregates for concrete mixes.

Owing to the variable geologic and soil conditions across the proposed development area, the subgrade conditions will vary across the site. Therefore, it is recommended that an aggregate for wearing courses be investigated. The excavatability of the stratum on site are anticipated to variable, based on material composition and texture, the degree of weathering, and the nature of discontinuities within the rock and/or soil mass. However, the seismicity in the region is considered low.

The assessment concluded that the primary concern of this development is alteration of the stability of the soil across the site. Changes in the soil conditions across the site are anticipated mainly to arise as a consequence of increased/concentrated runoff, yielding increased erosion.

However, the area planned for the development of the solar facility is generally of low relief and the topography is gently undulous, therefore, no major cut slopes and/or rock face stabilisations are anticipated for this development.

Traffic Impact Statement

The Traffic Impact Assessment (TIA) (refer to Appendix D.13) was undertaken by Ntuthuko Hlanguza to inform the outcome of this BA from a traffic perspective.

The TIA found that the highest traffic impact of the proposed development would occur during the construction phases, which are temporary in nature and whose impacts can be effectively mitigated. The existing site accesses were found to be sufficient for the proposed facility but may require some

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upgrades. No fatal flaws were identified in the proposed project in respect of transportation and traffic aspects. No environmentally sensitive areas are required and therefore no areas are to be avoided from a transportation perspective.

With reference to this report, associated assessment and the findings made within, the specialist notes that the proposed project has a nominal impact on the existing traffic network.

The proposed project is therefore deemed acceptable from a transport perspective, provided the recommendations and mitigation measures in this report are implemented, and hence the Environmental Authorisation (EA) should be granted for the BA application.

Impacts relating to BESS

The proposed solar PV facility will have a Battery Energy Storage System (BESS) of up to 1 500 MWh located adjacent the on-site substation. A high-level Safety Health and Environmental Risk Assessment (SHE RA) for the proposed development of BESS was undertaken by Deborah Mitchell and is included in Appendix D.8 of the BA Report.

Solid state Lithium-ion Redox flow (typically vanadium) BESS technologies are being considered and were assessed. The specific technology will only be determined following Engineering, Procurement and Construction (EPC) procurement.

Several specific recommendations were stated for the assessed BESS technologies (refer to the full SHE RA included in Appendix D. 8).

The assessment noted that at a large facility, without installation of the state-of-the-art battery technology that includes protective features, there can be significant risks to employees and first responders. The latest battery designs include many preventative and mitigative measures to reduce these risks to tolerable levels. State-of-the-art technology should be used, i.e., not old technology, such as liquid phase lithium-ion batteries, that may have been prone to fire and explosion risks. The design should be subject to a full Hazard and Operability Study (HAZOP) prior to commencement of procurement. A HAZOP is a detailed technical systematic study that looks at the intricacies of the design, the control system, the emergency system etc. and how these may fail under abnormal operating conditions. Additional safeguards may be suggested by the team doing the study.

Overall, the SHE RA found that with suitable preventative and mitigative measures in place, none of the identified potential risks are excessively high, i.e., from a Safety, Health and Environment (SHE) perspective no fatal flaws were found with either type of technology (solid state - lithium-ion or redox flow - vanadium) for the BESS installations at the proposed solar PV facility.

Civil Aviation

The proposed project study area was determined and verified to be of low sensitivity (as it relates to civil aviation). This was determined through a site visit and based on existing databases, and confirms the sensitivity allocated on the Screening Tool. Based on the above, in terms of GN R320, no further requirements are applicable i.e. a Compliance Statement is not required.

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Defence

The proposed project study area was determined and verified to be of low sensitivity (as it relates to defence installations). This was determined through a site visit and based on existing databases, and confirms the sensitivity allocated on the Screening Tool. Based on the above, in terms of GN R320, no further requirements are applicable i.e., a Compliance Statement is not required.

EAP'S RECOMMENDATION

None of the negative impacts that have been identified within this BA, 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. 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 imperative, 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 Programmes (EMPrs) included in Appendix H - K 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 moderate to very low negative environmental impact and an overall moderate positive socio-economic impact³ in all phases (construction, operation and decommissioning), with there being a potential high positive impact during the operational phase (with the implementation of respective mitigation and enhancement measures).

Table E and F below provides a summary of the impact assessment for each phase of the proposed Padloper PV 4 and Padloper EGI 4 projects **post mitigation for direct impacts**. Table G and H provides the same information for the **cumulative impacts for each project**.

³ Only applicable to the Padloper PV 4 project

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Table E. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the Padloper PV 4 project

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Visual	Low		Moderate		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	Very Low		Very Low		Very Low	
Aquatic Biodiversity and Species	Very Low		Very Low		Very Low	
Avifauna	Very Low	Moderate	Low	Very Low	Very Low	Moderate
Socio-Economic	Low	Moderate	Low		Low	Moderate
Geotechnical	Very Low		Very Low		Very Low	
Traffic	Low		Low		Low	
DIRECT POSITIVE IMPACTS						
Socio-Economic	Moderate		Moderate	High	Moderate	

Table F. Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the Padloper EGI 4 project

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Visual	Low		Low		Low	
Heritage (Archaeology and Cultural Landscape)	Low		Moderate		Low	
Palaeontology	Low		Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable	
Terrestrial Biodiversity and Species	Very Low		Very Low		Very Low	
Aquatic Biodiversity and Species	Very Low		Very Low		Very Low	
Avifauna	Low	Very Low	Moderate	Very Low	Low	Very Low

As indicated in Table E (Padloper PV 4 project), 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

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Avifauna and Socio-economic impacts being rated as **moderate to very low**. In terms of the operational and decommissioning phases, the majority of the **direct negative impacts** were rated with a **low to very low post mitigation impact significance**, with only the Avifauna, Socio-economic, Heritage and Visual impacts being rated as **moderate to very low**. In terms of **positive impacts**, the Socio-Economic impacts are rated as **moderate significance** for the **construction, and decommissioning phase** and **moderate to high** for the **operational phase**.

As indicated in Table F (Padloper EGI 4 project), it is evident that the majority of the **direct negative impacts** were rated with a **low to very low post mitigation** impact significance for the **construction phase**. In terms of the **operational and decommissioning** phases, the majority of the **direct negative impacts** were rated with a **low to very low post mitigation** impact significance, with only the Heritage and Avifauna impacts being rated as **moderate to very low**.

Table G. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the Padloper PV 4 project

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

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Table H. Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the Padloper EGI 4 project

Specialist Assessment	Construction Phase	Operational Phase	Decommissioning Phase
CUMULATIVE NEGATIVE IMPACTS			
Visual	Moderate	Moderate	Low
Heritage (Archaeology and Cultural Landscape)	Low	Low	Low
Palaeontology	Low	Insignificant and/or not identified and/or not applicable	Insignificant and/or not identified and/or not applicable
Terrestrial Biodiversity and Species	Very Low	Very Low	Very Low
Aquatic Biodiversity and Species	Very Low	Very Low	Very Low
Avifauna	Moderate	Moderate	Moderate

Based on Table G (Padloper PV 4 project), the majority of the **cumulative negative impacts** were rated **very low to low post mitigation impact significance with moderate impact significance** being recorded for the Visual, Socio-economic and Avifauna themes. In terms of **positive impacts**, the Socio-Economic impacts are rated as **moderate to high significance** to for the construction, and decommissioning phase and **high** for the operational phase.

Table H, relevant to the Padloper EGI 4 project, indicates that, the majority of the **cumulative negative impacts** were rated **very low post mitigation impact significance with low impact significance** and **moderate impact significance** being recorded for the Visual and Avifauna theme.

Note that all the specialists have recommended that the proposed project receives EA on condition that the recommended mitigation measures are implemented. Also, note that all conclusions and recommendations made in the respective Specialist Impact Assessment Reports have been incorporated into the project specific EMP for adherence.

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, and also the additional proposed projects comprising the Padloper Solar and EGI Cluster. 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 Padloper PV 4 site and majority of the Padloper EGI 4 servitude are located within Beaufort West REDZ (REDZ 11), which supports the development of large-scale wind and solar energy developments. In addition, the Padloper PV 4 site and majority of the Padloper EGI 4 servitude are located in the Central Strategic Transmission Corridor. The proposed projects are therefore in line with the national planning vision for wind and solar development in South Africa.

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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 location of the Proposed Padloper PV 4 and Padloper EGI 4 projects in relation to the Beaufort West REDZ and the Central Strategic Transmission Corridor, 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 nearby towns (i.e., Murraysburg and Graaf-Reinet) and surrounding regions, as well as making a positive contribution to energy generation for South Africa. 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.

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

<u>Appendix 1</u>	YES / NO	SECTION IN BA REPORT
<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> <p>(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</p>	Yes	Section A.10

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Appendix 1	YES / NO	SECTION IN BA REPORT
(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 -	Yes	Section A.13
(i) details of all the alternatives considered;		
(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 D.1
(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-	Yes	Section A.13
(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;		
(j) an assessment of each identified potentially significant impact and risk, including-	Yes	Section D and Appendix D
(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 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, Section E and Appendices H-K
(l) an environmental impact statement which contains-	Yes	Section E

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Appendix 1	YES / NO	SECTION IN BA REPORT
(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;		
(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 and E
(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 D
(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	Comments raised during the 30-day review of the BID and the Draft BA Report have been addressed at relevant points throughout the Final BA Report.
(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 that are applicable.