

Basic Assessments for the proposed development of the Megora Solar Photovoltaic Facility 2 (i.e., Megora PV 2), as well as the proposed development of a 132kV overhead power line between the proposed Megora Solar PV 2 and the proposed Megora Solar PV 1A (i.e., Megora EGI 2), and their associated infrastructure, near Murraysburg in the Western Cape Province

EXECUTIVE SUMMARY

Megora PV 2



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



Executive Summary

MEGORA PV 2 PROJECT

INTRODUCTION

Megora PV (Pty) Ltd (hereinafter referred to as “the Project Applicant¹”) is proposing the development of four solar photovoltaic (PV) facilities with a capacity of between 90 and 170 MW each, four associated 132 kV overhead power lines, and their associated infrastructure, approximately 20 km north of the town of Murraysburg in the Beaufort West Local Municipality, Central Karoo District Municipality, Western Cape province (Figure A.2 and A.3).

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

- **PROJECT 1:** Basic Assessment for the proposed development of the Megora Solar PV Facility 1A and associated infrastructure (i.e., Megora PV 1A), near Murraysburg in the Western Cape Province
- **PROJECT 2:** Basic Assessment for the proposed development of the Megora Solar PV Facility 1B and associated infrastructure (i.e., Megora PV 1B), near Murraysburg in the Western Cape Province
- **PROJECT 3:** Basic Assessment for the proposed development of the Megora Solar PV Facility 1C and associated infrastructure (i.e., Megora PV 1C), near Murraysburg in the Western Cape Province
- **PROJECT 4:** Basic Assessment for the proposed development of the Megora Solar PV Facility 2 and associated infrastructure (i.e., Megora PV 2), near Murraysburg in the Western Cape Province
- **PROJECT 5:** Basic Assessment for the proposed development of a 132kV overhead power line and associated infrastructure between the proposed Megora Solar Facility 1A to a suitable Main Transmission Station (as advised by Transmission Authorities) (i.e., Megora EGI 1) near Murraysburg in the Western Cape Province
- **PROJECT 6:** Basic Assessment for the proposed development of a 132kV overhead power line and associated infrastructure between the proposed Megora Solar PV Facility 2 and the proposed Megora Solar Facility 1A (i.e., Megora EGI 2) near Murraysburg in the Western Cape Province

¹ The ‘Project Applicant’ and ‘Project Developer’ are used synonymously through the BA Report.

BASIC ASSESSMENT REPORT: Basic Assessment for the proposed development of the Megora Solar PV Facility 2 and associated infrastructure (i.e., Megora PV 2) and the proposed development of a 132kV overhead power line and associated infrastructure between the proposed Megora Solar PV Facility 2 and the proposed Megora Solar PV Facility 1A (i.e., Megora EGI 2) near Murraysburg in the Western Cape Province

It is anticipated that the proposed 132 kV overhead power line connecting the proposed Megora PV 2 facility to the proposed Megora PV 1A facility (i.e., Project 6) and the 132 kV overhead power line extending from the proposed Megora PV 1A facility to a nearby suitable Main Transmission Station as advised by the National Transmission Company South Africa (NTCSA) (i.e., Project 5); are planned to be handed over to Eskom (should Environmental Authorisation (EA) be granted). Therefore, in this regard separate BA Processes are being undertaken and separate EAs are being sought for these projects (i.e., Projects 5 and 6). Note, however, that combined reporting has been approved by the DFFE for Megora PV 2 and EGI 2, as discussed in detail in Section A.2 of the BA report.

The proposed 132 kV overhead power lines connecting the proposed Megora PV 1B (Project 2) and Megora PV 1C (Project 3) to Megora PV 1A (Project 1) will be retained by the Project Applicant and as such these powerlines will be included in the respective solar PV facility assessments. Refer to Figure A which provides a summary schematic depicting the projects comprising the Megora Solar PV Cluster.

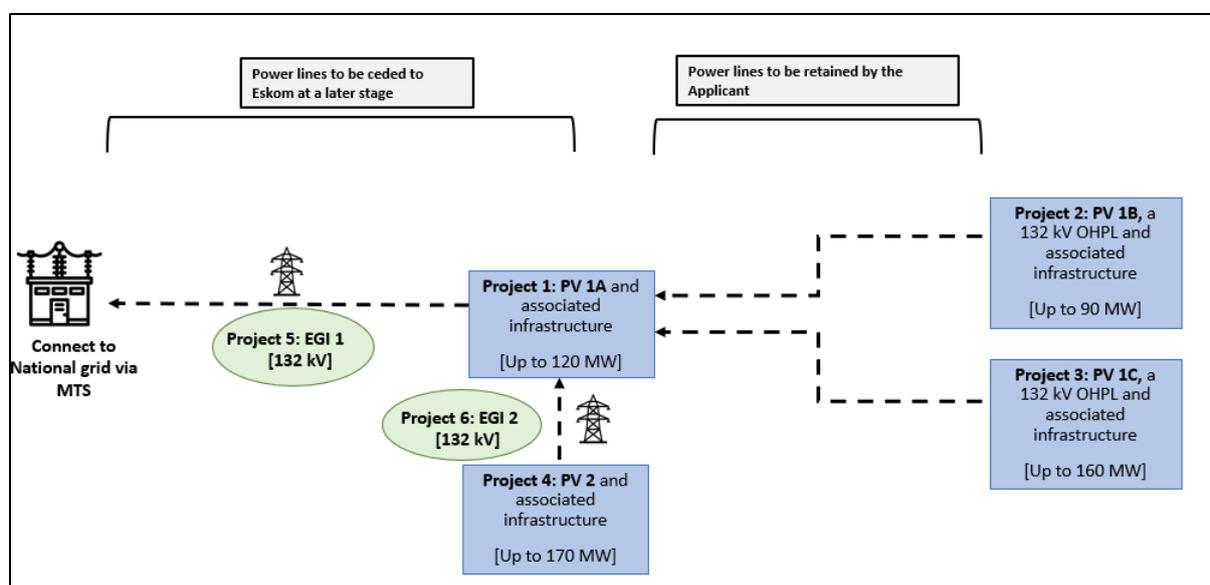


Figure A: Summary schematic of the project comprising the proposed Megora Solar PV Cluster

It is understood that the Project Applicant is currently engaging with the Eskom and the NTCSA to confirm a suitable connection point from which the power generated by the Megora Solar PV Cluster can be injected into the national grid. Once this guidance has been received, the Project Developer will finalise the proposed Megora EGI 1 route, after which the required Environmental Assessment process for this stage will be undertaken.

Therefore, at this stage only the BA Processes for the proposed Megora PV 1A-C, PV 2 and EGI 2 are being undertaken concurrently (i.e., Projects 1-4 and Project 6 listed above).

This combined BA Report pertains to Megora PV 2 (Project 4) and Megora EGI 2 (Project 6). Separate Draft BA Reports have been prepared for Projects 1–3 (i.e., Megora PV 1A–C) and are being released concurrently to all Interested and/or Affected Parties (I&APs), Organs of State, and relevant stakeholders for a 30-day public review period. All comments received during the review period will be recorded and addressed in a comprehensive Comments and Responses Report (CRR).

The entire proposed Megora PV 2 site and the proposed Megora EGI 2 route and falls within the Renewable Energy Development Zone (REDZ) 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

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generation facilities (GG 41445, GN 114; 16 February 2018 and GN 144; 26 February 2021). The REDZs represent areas where wind and solar PV development is being incentivised from resource, socio-economic and environmental perspectives. To date, the DFFE has gazetted 11 REDZs as well as procedures for submitting applications for EA and reduced decision-making timeframes within these REDZs, which have reduced the review timeframes by half and significantly simplified the authorisation process. In addition, the entire Megora PV 2 site and Megora EGI 2 route site is located within the Central Strategic Transmission Corridor, one of the five EGI Power Corridors formally gazetted for implementation on 16 February 2018 in GG 41445, GN 113. An additional two expanded corridors were gazetted in GN 1637 on 24 December 2021.

In line with the gazetted process for projects located within a REDZ, both of the proposed projects are subject to BA Processes instead of a full Scoping and EIA processes and a reduced decision making period of 57 days, in terms of the NEMA and the 2014 NEMA EIA Regulations (as amended). Separate BA Processes (with combined reporting as outlined in Section A.2 above) in terms of Appendix 1 of the 2014 NEMA EIA Regulations (as amended) are therefore being undertaken for the proposed projects.

As requested, the combined BA Report is submitted with distinct and clear sections dedicated to the PV facility and EGI. As such this Executive Summary only outlines the findings of the assessments undertaken for the Megora PV 2 project. Refer to the summary table included ahead of Section A of the combined BA Report outlining in which sections of the report are applicable to Megora PV 2 project and/or the Megora EGI 2 project.

PROJECT LOCATION

The locality of the proposed Megora PV 2 project is shown below in Figure B. The co-ordinates of the proposed project sites are detailed in Section B of this BA Report.

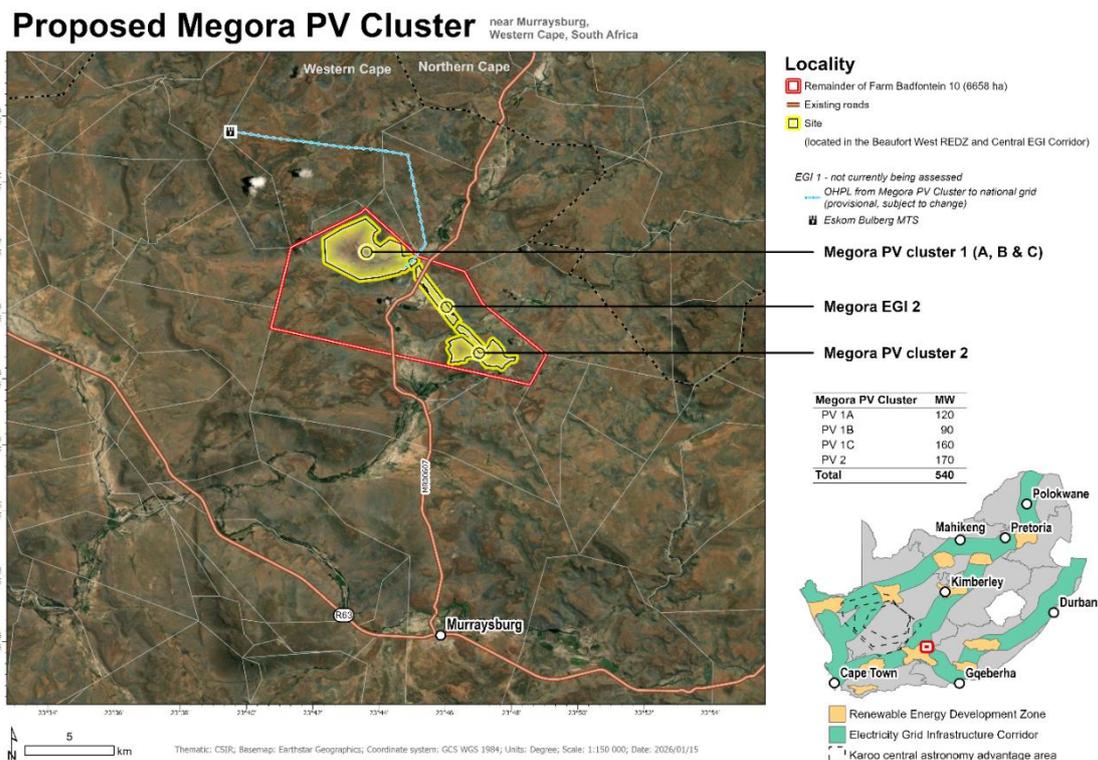


Figure B. Locality of the proposed Megora PV Cluster.

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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 A below.

Table A: Project Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (<i>Registered EAP (2019/745)</i>)	CSIR	EAP and Project Leader
Rohaida Abed (<i>Registered EAP (2021/4067)</i>)	CSIR	Project Team Member
Dhiveshni Moodley (<i>Pr.Sci.Nat.</i>)	CSIR	Project Manager
Luanita Snyman-van der Walt (<i>Pr.Sci.Nat.</i>)	CSIR	Project Mapping
Suvasha Ramcharan (<i>Cert.Sci.Nat and Cand. EAP</i>)	CSIR	Project Officer
Helen Antonopoulos (<i>Cand.Sci.Nat.</i>)	CSIR	Project Officer
Sonto Mkize (<i>Cand. Planner</i>)	CSIR	Project Officer
Kimara Moodley (<i>Cand.EAP</i>)	CSIR	Project Officer
Specialists		
Johann Lanz and David Lakey	SoilZA	Agricultural Compliance Statement
Kamogelo Rakale	SLR Consulting	Visual Impact Assessment
John Gribble	TerraMare Consulting	Heritage Impact Assessment (Archaeology, Cultural Landscape)
Elize Butler	Banzai Environmental	Palaeontology Impact Assessment
Tarryn Martin and Amber Jackson	Biodiversity Africa	Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species
Russell Tate	Tate Environmental Specialist Services	Aquatic Biodiversity and Species Impact Assessment
Anja Albertyn	Holland & Associates Environmental Consultants	Avifauna Impact Assessment
Hugo van Zyl and Holly Johnson	Independent Economic Researchers	Socio-Economic Impact Assessment
Debbie Mitchell	Ishecon	BESS Risk Assessment
Iris Wink	iWink Consulting	Traffic Impact Assessment
Hardy Luttig, Dale Barrow and Shane Teek	GEOSS South Africa (Pty) Ltd	Geohydrology Assessment
Hardy Luttig and Shane Teek		Desktop Geotechnical Assessment
Dhiveshni Moodley, Helen Antonopoulos and Luanita Snyman-van der Walt	CSIR	Civil Aviation Site Sensitivity Verification
Dhiveshni Moodley, Helen Antonopoulos and Luanita Snyman-van der Walt	CSIR	Defence Site Sensitivity Verification

PROJECT DESCRIPTION

The proposed Megora PV 2 will have a capacity of up to 170 MW. An area of approximately 1 100 ha was surveyed and sensitive environmental features identified. This area is defined as the study area. Following consideration of the identified features, a permanent development footprint of up to approximately 255 ha and a temporary development footprint approximately 3.5 ha was proposed for the proposed project. The permanent footprint will include the development of the solar field, BESS buildings, Operations and Maintenance (O&M) complex, and associated infrastructure.

During the pre-application phase of this BA Process, the study area was plotted on the National Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool to identify high-level environmental sensitivities. The specialists considered these sensitivities and undertook Site Sensitivity Verifications (SSVs) within the study area, where required, in order to confirm or dispute the sensitivities identified by the Screening Tool. The specialists then formulated environmental feature and sensitivity maps for the study area. Thereafter, the Project Developer took such sensitivities, and other considerations, into account and formulated the Buildable Areas, which avoid the no-go areas identified by the specialists. The Buildable Areas were also used to inform the design of the layout that was subjected to further detailed assessments during this BA Process. The proposed project will consist of the key components displayed in Figure C below.

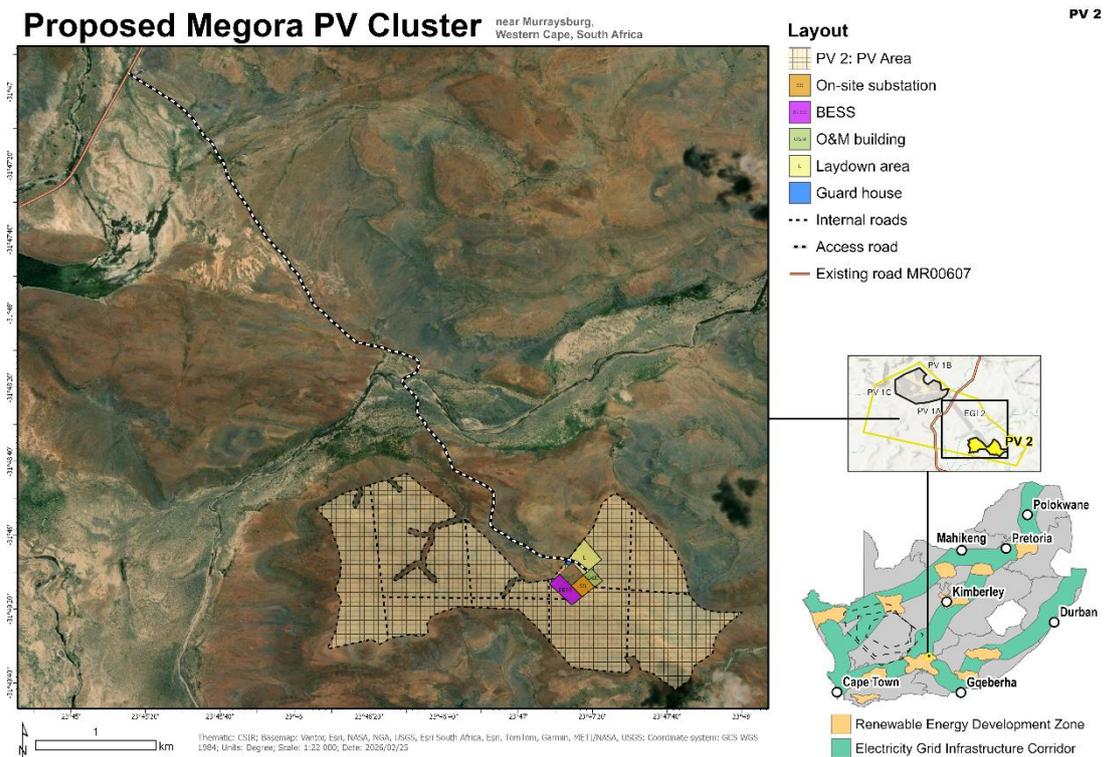


Figure C: Layout of the proposed project

A summary of the key components of the proposed Megora PV 2 and associated infrastructure and technical information is described and listed in Table B below.

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Table B: Description of the Project Components

Infrastructure	Component	Dimensions / Specifications
Solar PV facility	Type of technology	Solar Photovoltaic (PV) Technology
	Height of PV panels	Maximum of ± 4.5 m
	Capacity of the PV facility	Up to 170 MW
	Area of PV Array (i.e., proposed area occupied by PV Modules)	250 ha 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) are anticipated to be similar.
	Technology mounting structure	The following technologies are being considered: <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 Structures; • Mono-facial Solar Modules; or • Bifacial Solar Modules.
	Inverter-transformer stations	Up to 5 MW inverters will be located across the proposed project. The exact number of inverters is still to be confirmed however all inverter-transformers will be within the PV array.
	Area occupied by inverter-transformer stations and height	Inverter-transformer stations: 0.003 ha each The inverter stations will have a height of ± 3 m each. Note: The height mentioned above excludes the height of lightning rods. The rods installed on the stations (each with a height of ± 3 m) are expected to extend to 10 m high. Each inverter station will have 4 lightning rods.
Associated infrastructure		
Temporary construction and laydown area	Construction camp area (ha)	The proposed facility will have one temporary construction and laydown areas covering 3.5 ha. Note: This area will be rehabilitated after construction and will not be retained for the operational phase.
Main access roads Note: The existing road network will be used as far as practically possible and upgraded as needed.	Current width of access roads (m)	4 m
	Length of access roads (km)	5.79 km
	Upgraded width (m)	Up to 8 m for main access roads to the site entrances (6 m wide road surface with 1 m drain either side)
Internal roads	Width of access roads (m)	4 m
	Length of roads (km)	Approximately 18.7 km

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Infrastructure	Component	Dimensions / Specifications
Note: The existing road network will be used as far as practically possible and upgraded as needed. Where required for turning circle/bypass areas, however, access or internal roads may be up to 10 m to allow for larger component transport.		The internal road network will be used to conduct security patrols and to access all the equipment (module cleaning and equipment maintenance).
	Upgraded width (m)	Up to 6 m
Internal medium voltage cables	All on-site medium voltage cabling (22 or 33 kV) may be buried to a maximum depth of 1.5 m or if above ground, then the cables will be mounted on an enclosed cable tray, between ground surface level and 0.5 m.	
Site offices including a warehouse/workshop and an operational and maintenance (O&M) control centre. The details provided in this section are for one site office.	Number of buildings	Site offices and 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 (m)	Up to 10 m
	Footprint (ha)	1 ha
Guard house	Maximum height (m)	Up to 3 m
	Footprint (m ²)	± 7 m x 5 m ± 35 m ² with an ablution facility and outside shaded area.
Ablution facilities Note: There will be ablution facilities located within the guardhouse footprints. The details provided in this section are for one ablution facility. Additional ablution facilities may be within the O&M Building complex.	Maximum height (m)	Up to 10 m
	Footprint (m ²)	± 242 m ²
Battery energy storage system (BESS)	Battery technology type	Lithium-ion, Sodium-ion, Solid State and Redox Flow technology types are being considered.
	Approximate footprint (ha)	2.5 ha
	Maximum height (m)	Up to 10 m
	Capacity	1020 MWh
On-site substation complex	A 132 kV facility substation complex will be located within the site, and will cover an area of approximately 1.5 ha and will have a height of up to 18 m.	
Water use requirements	Estimated quantity of water required for the construction phase	30 000 m ³ per annum
	Estimated quantity of water required for the operational phase	8 000 m ³ per annum
	Estimated quantity of water 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 or less than that of the construction phase.
Construction period	< 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”.*

Section H of this 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, Megora PV (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

A summary of the specialist studies is outlined below.

Full specialist studies are provided in Appendix F of this BA Report. Section E of this report provides a summary of the affected environment associated with these studies; and Section O provides a summary of the impact assessments conducted by the specialists.

Agriculture

The Agriculture Compliance Statement was undertaken by Johann Lanz and David Lakey of SoilZa Pty (Ltd) to inform the outcome of this BA from an agricultural and soils perspective. The complete Agriculture Compliance Statements are included in Appendix F. 1 of the BA report.

The following potential impact mechanisms of the proposed development are identified:

- **Loss of agricultural production potential** due to soil degradation, which includes soil erosion and loss of topsoil. This could occur predominantly in the construction and decommissioning phases of development. It can be effectively prevented by generic mitigation measures that are all inherent in the project engineering of such a development and are standard, best-practice for construction sites. Soil degradation does not therefore pose a significant impact risk.
- **Increase in agricultural production potential** due to increased financial security for farming operations through rental income generation for the farm during the operational phase of the development. This provides reliable and predictable income that is independent of variable agricultural economic factors such as weather, agricultural markets and agricultural input costs. This is a big economic advantage for a farmer and can improve farming operations and productivity on other, higher potential parts of the farm or farms owned by the same farmer, through increased investment into farming.

- **Improved security against stock theft and other crime** due to the presence of security infrastructure and security personnel at the energy facility.

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 4822 MW) will amount to a total of approximately 8493 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 3% of the surface area. This is well 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. This is particularly so when considered within the context of the following point.

The assessment found that, aside from renewable energy developments, there are limited competing land uses for agricultural land in the area. As a result, the cumulative impact associated with non-renewable developments is expected to be Low.

For renewable energy projects, the potential loss of agricultural production due to soil degradation can be effectively avoided through standard, best-practice mitigation measures that are inherent to project design and construction methodologies. Soil degradation is therefore not considered a source of cumulative impact risk.

Overall, the cumulative impact related to the loss of future agricultural production potential is assessed as low and is not expected to result in an unacceptable reduction in the area's agricultural capability.

Therefore, the specialist confirmed that the project is acceptable from an agricultural impact point of view.

Visual Impact Assessment

The Visual Impact Assessments (refer to Appendix F.5) were undertaken by Kamogelo Rakale of SLR Consulting (Pty) Ltd, 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.

The study area is not typically valued for its tourism significance and only two guesthouses were identified within 5 kms of the proposed development. The assessment identified a total of four visual receptor locations within the study area, two of which were identified as sensitive visual receptors as they were found to be nature/leisure-based tourism facilities mostly associated with the pristine and picturesque qualities of the Karoo cultural landscape. None of the identified receptors that fall within the proposed development's viewshed, would experience high levels of visual impact as a result of the proposed development.

The viewshed analysis conducted found that the proposed infrastructure would be visible for much of the 5 km study area. Areas experiencing the highest levels of visibility will be concentrated within the SEF development area and some areas to the south of the SEF while areas to the west will experience the least levels of visibility. The localised topographic variations resulting from the hills and ridges spread across the landscape would provide some screening and would limit views of the project components to the northern, eastern and southern sectors of the study area.

Overall the assessment revealed that, visual impacts (post mitigation) associated with the proposed project are of Low significance during the decommissioning phase of the project. During construction and operation however, visual impacts resulting from the visual intrusion and alteration of the Karoo landscape, sense of place and light pollution at night, would be of Moderate significance with relatively few mitigation measures available to reduce the visual impact.

A number of additional renewable energy developments were identified within a 30 km radius of the Megora PV Cluster. These developments and their associated infrastructure, in conjunction with the proposed project and the greater Megora Solar PV Cluster, will inevitably introduce an increasingly industrial character into a largely natural, pastoral landscape, thus giving rise to significant cumulative impacts and thereby increasing the number of receptors affected by the visual intrusion of the developments. It is however expected that these developments in close proximity to each other would be seen as one large renewable energy facility rather than several separate developments and although this will not necessarily reduce impacts on the visual character of the area, it could potentially reduce the cumulative impacts on the landscape. Considering this, the cumulative impacts (post-mitigation) have also been rated as Moderate during the construction and operation phases of the project and Low during the decommissioning phase. It is however anticipated that these impacts could be mitigated to acceptable levels with the implementation of the recommended mitigation measures.

Based on the above, it is specialists' opinion that, although the potential visual impacts associated with the proposed Megora PV 2 project and associated infrastructure are negative and of moderate significance, the visual effects of the project on individual receptors have been assessed to be tolerable. None of the roads within the study area (i.e., R63, MR00607) are specifically valued or utilised for their scenic or tourism potential and are therefore not regarded as visually sensitive. **The specialist therefore confirmed that the project is acceptable from a visual perspective.**

Heritage Impact Assessment (Archaeology and Cultural Landscape)

The Heritage Impact Assessment was undertaken by John Gribble of TerreMare Archaeology (Pty) Ltd, to inform the outcome of this BA from an archaeology and cultural heritage and landscape perspective. Separate integrated Heritage Impact Assessment for the proposed PV project containing Archaeology, Cultural Landscape and Palaeontology were undertaken. However, for ease of reference, this section only deals with the Archaeology and Cultural Landscape (Appendix F.6) of this BA Report.

The survey undertaken for proposed Megora PV 2 project found very little archaeology within the development footprint and surrounding area, none of which was considered more than low significance. A Late Stone Age (LSA) artefact scatter was recorded during a previous survey in an area without a landscape focus usually present for pre-colonial sites. Most artefacts were of hornfels, but other materials (tuff and/or wacke) were also present. Two adzes were observed on the proposed site. This lithic scatter was assessed to be Grade 3C and thus of low local heritage significance. A second, ephemeral scatter of approximately 5 LSA flakes (but no cores) was noted on the edge of a ridge

overlooking a valley in the western portion of the site. The artefacts were made on tuff / wacke. This archaeological occurrence was assessed to be ungradable and thus of very low heritage significance. The remainder of the archaeological occurrences recorded within the Megora PV 2 area were historical stone cairns located in the north-western corner of the project area that could represent historical farm boundary markers. These cairns were graded 3C and are of low, local significance.

No extant historical built structures are located within the Megora PV 2 project footprint. A packed stone kraal was recorded in the river valley east of and outside the project area, it will not be directly impacted by the Megora PV 2 facility.

The cultural landscape which reflects the recent historical use of the land on which the Megora PV 2 facility will be located for stock farming is not well developed. Its main features are farm infrastructure like fences, water troughs and wind pumps.

The specialist noted that, although the construction of the Megora PV 2 facility will substantially alter the existing landscape character of the project site and contrast strongly with the pre-colonial and historical human elements present in the landscape, the development will occur within a cultural landscape that is best described as a continuing landscape. The landscape surrounding the Megora PV 2 project site is already undergoing a transition towards an increasingly industrial character, driven by its location within the Beaufort West REDZ and the ongoing development of renewable energy projects in the wider area.

The Heritage Impact Assessment therefore concluded that the proposed site is a heritage environment of variable sensitivity but that significant impacts on palaeontological, archaeological and other heritage resources arising from the project are unlikely since no archaeological sites are under threat and no other heritage resources will be significantly impacted. Impacts on the cultural landscape are expected to be the most significant impacts, but these may be reduced through the implementation of suitable mitigatory measures.

Based on the above, the heritage specialist is of the opinion that the proposed project may be authorised in full, subject to recommendations which should be included as conditions of authorisation and contained in the EMPr (Refer to Section P of this BA Report).

Palaeontology Impact Assessment

The Palaeontology Impact Assessment was undertaken by Elize Butler of Banzai Environmental (Pty) Ltd, to inform the outcome of this BA from a palaeontological perspective. As noted above, an integrated Heritage Impact Assessment containing Archaeology, Cultural Landscape and Palaeontology has been undertaken for the project. However, for ease of reference, this section only deals with the Palaeontology. The detailed Palaeontological Impact Assessment is included in Appendix F.7 of this BA Report.

The palaeontological impact assessment indicates that proposed site is predominantly underlain by unfossiliferous Jurassic Dolerite, while the remainder of the site is underlain by Middle–Late Permian continental fluvial and lacustrine sediments of the Hoedemaker Member (Teekloof Formation), together with small exposures of the Balfour Formation. Both formations form part of the Adelaide Subgroup of the Beaufort Group, Karoo Supergroup. The access road traverses areas of Quaternary Alluvium.

Although several fossiliferous outcrops were recorded west of the proposed project site, the field investigation and supporting desktop review (National Museums Database and published literature) indicate that fossil occurrences of scientific or conservation significance in this area are relatively rare. In addition, no fossils or fossiliferous outcrops were identified within the Megora PV 2 development

footprint. Available data suggest that fossil localities are generally sporadic, scattered, and unpredictable in distribution.

It is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area. **The specialist therefore confirmed that the proposed development is acceptable from a palaeontological perspective, as the development footprint is not considered sensitive in terms of palaeontological resources.**

Terrestrial Biodiversity and Species Impact Assessment

The Terrestrial Biodiversity and Species Assessment (refer to Appendix F.2) was undertaken by Tarryn Martin and Amber Jackson of Biodiversity Africa (Pty) Ltd, to inform the outcome of this BA from a terrestrial biodiversity and species perspective.

The project area comprises three broad faunal habitat types, grassland with scrub habitat (i.e., Eastern Upper Karoo), Wash, Southern Karoo Riviere and Riparian habitat and Rocky outcrops, crests and slopes (i.e., Upper Karoo Hardeveld). These habitats support a range of amphibian, reptile and mammal species that utilise these habitats either permanently or opportunistically. According to IUCN (2024) records, the area intersects with the distribution ranges of 11 amphibian, 63 reptile and 69 mammal species, with no amphibian species of conservation concern (SCC) expected to occur. One reptile SCC, the Near Threatened Tent Tortoise (*Psammobates tentorius*), has a high likelihood of occurrence and will require mitigation to prevent loss of individuals, while seven mammal SCC may occur at varying likelihoods, four of which (i.e., Black-footed Cat, Southern Mountain Reedbuck, Grey Rhebok and Cape Clawless Otter). A total of 65 plant species from 28 families were recorded within the Project Area of Influence (PAOI), dominated by the Asteraceae, Aizoaceae and Poaceae families. Three plant SCC with low to medium likelihood of occurrence were identified, although no threatened plant species were recorded during the field survey.

The specialist acknowledges that the proposed layout has undergone several iterations to reduce the impact of the project infrastructure on the environment and largely avoids Critical Biodiversity Areas (CBAs). According to the WCBSP (2023), the proposed project site is traversed by a number of aquatic ESAs, and a Terrestrial CBA is located to the west of the site. The field survey conducted by the Aquatic specialist found that the CBA and ESA classifications, as delineated in the WCSBP 2023, within the study area, are inaccurate. In addition, the Terrestrial specialist confirmed that although the panel array area is situated in a CBA 1 terrestrial the specialist is of the opinion that the impact on this feature will be negligible. The biodiversity features driving the ESA and nearby CBA classifications for the project area are discussed in detail in Appendix F.2 and specialist is of the opinion that it is unlikely the project will impact on the underlying features driving the designation of the CBA and it is therefore unlikely to impact on their management objectives.

The specialist concluded that where feasible, avoidance mitigation has been applied to project infrastructure that was positioned in the CBA and ESAs as well as within areas classified as high sensitivity. Furthermore, the residual impacts associated with the proposed development were determined to be low and very low. **As such, it is the opinion of the specialists that the development can proceed, provided that the recommendations and mitigation measures outlined in this report are implemented.**

Aquatic Biodiversity and Species Impact Assessment

The Aquatic Biodiversity Assessment was undertaken by Russell Tate of Tate Environmental Services (Pty) Ltd, to inform the outcome of this BA from an aquatic biodiversity perspective. The complete Aquatic Biodiversity and Species Assessments are included in Appendix F.3 of this BA Report.

The assessment confirmed that the proposed project is located within the L21C and L21E quaternary catchments of the Fish-Tsitsikamma Water Management Area. The nearest Sub Quaternary Reach (SQR) associated with the established Area of Interest (Aoi) included the the L21C-06621 of the Bakensklip River as well as an unnamed tributary of the L21E-06789 SQR of the Snyderskraal River. The watercourses form the headwaters of the Kariega River which flows into the Groot River before flowing into the Gamtoos River system and exiting into the Indian Ocean.

The outcome of this assessment delineated 3 watercourse hydrogeomorphic (HGM) units within the Aoi. These watercourses were derived to range from largely modified (class D) and largely natural (class B) Present Ecological Status (PES). The watercourses were classified as having Moderate Ecological Importance and Sensitivity (EIS) ratings. A scientific buffer was calculated for the watercourses, where a 40m buffer for wetlands and 30m for rivers was utilised to protect these sensitive environments. Based on the proposed layouts, all infrastructure avoids buffered features. All mitigation measures recommended in the assessment have been incorporated into the EMPs (Appendix H of this BA Report).

Overall, the outcome of the risk assessment indicates minor impacts from the proposed activities and no fatal flaws were identified from an aquatic perspective. The minor impacts can be attributed to the avoidance of the sensitive habitats and implementation of buffer zones. Should avoidance and basic mitigation actions be implemented, limited impacts to aquatic biodiversity can be expected.

As such, it is the opinion of the specialists that the development can proceed, provided that the recommendations and mitigation measures outlined in this report are implemented.

Avifauna Assessment

The Avifauna Impact Assessments were undertaken by Anja Albertyn of Holland & Associates Environmental Consultants (Pty) Ltd, to inform the outcome of this BA from an avifaunal perspective. The complete Avifauna Impact Assessments are included in Appendix F.4 of this BA Report.

The Site Ecological Importance rating of Medium indicates that the 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 Avifaunal specialist concluded that proposed PV 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 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.

Due to the footprint of the proposed development, approximately 250 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), including Blue Crane, Karoo Korhaan, Ludwig's Bustard, Lanner Falcon, Martial Eagle, and Verreaux's Eagle. However, due to these

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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.

The cumulative impact of the proposed developments in a 30 km radius on avifauna is rated as of moderate negative impact significance with and without mitigation. The contribution of the Megora PV 2 to the cumulative impact is relatively small, and the proposed Megora PV 2 development will not result in a change in impact significance for cumulative impacts.

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

Socio-Economic Assessment

The Socio-Economic Assessment (refer to Appendix F.8) was undertaken by Hugo Van Zyl and Holly Johnson of Independent Economic Researchers (Pty) Ltd, to inform the outcome of this BA from a socio-economic perspective.

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. In addition, the project would contribute to local socio-economic and enterprise development. These positive impacts would be especially important at a local level where unemployment remains extremely high amid low economic growth and a lack of new opportunities to assist with much needed rejuvenation. Impacts associated with expenditure on the construction and operation of the project are rated as having positive moderate and positive high significance respectively.

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. This rating comes with the caveat that the impact on individually affected community members has the potential to be high. 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.

It is considered most likely that the positive impacts of the project would exceed its negative impacts resulting in an overall net benefit with mitigation compared to the no-go alternative (status quo). The project is therefore deemed acceptable in terms of socio-economic impacts and should be allowed to proceed.

Geohydrology Assessment

The Geohydrology Assessment (refer to Appendix F.12) was undertaken by Hardy Luttig of GEOSS South Africa (Pty) Ltd, to inform the outcome of this BA from a geohydrological perspective.

The regional study area of the proposed project is underlain by a fractured aquifer directly overlain by an unsaturated horizon of silty sand of variable thickness. The fractured aquifer which directly underlies the proposed project has potential average borehole yields of 0.50 L/s to 2.00 L/s. The maximum

anticipated water demand of proposed project at any time between the construction- and decommissioning phase is anticipated to be 0.95 L/s. This requirement is less than the expected regional average borehole yields. As such, groundwater demand from the project is low relative to the potential regional supply. It is therefore deemed that sufficient groundwater is available to address the water requirements for the project during the different project phases.

In addition, there are several boreholes which can act as a potentially viable source of groundwater for the development of proposed project, should the use of borehole water be considered a requirement. The use of these boreholes will depend on the construction and operational requirements of the facility, negotiations with the landowners and proximity to the facility.

If the individual facilities forming part of the proposed Megora Solar PV Cluster be constructed simultaneously along with other approved renewable facilities, the utilisation of multiple boreholes on the Remainder of the Farm Badfontein No. 10 as well as its neighbouring farm portions may be considered. An additional option would be to investigate additional water sources to supplement groundwater for the water demands of the renewable facilities. The simultaneous development of the proposed Megora Solar PV Cluster along with nearby approved renewable projects should be carefully considered with regards to groundwater supply. Although the anticipated water requirements should potentially be met by the utilisation of multiple boreholes from affected farm portions the specialist notes that farming activities in the Central Karoo is highly dependable on groundwater for mainly livestock and in some cases for domestic use. Sustainable development and utilisation of groundwater for renewable energy facilities and farming to take place simultaneously is essential.

Given these conclusions, from a geohydrological perspective, the specialist recommends that development of the proposed project be authorised provided that the mitigation measures (as set out in the Geohydrological Assessment) are implemented during each phase of the project to suppress the intensity of identified potential impacts.

Desktop Geotechnical Assessment

The Geotechnical Assessment (refer to Appendix F.11) was undertaken by Hardy Luttig of GEOSS South Africa (Pty) Ltd, to inform the outcome of this BA from a geotechnical perspective.

Soil and rock conditions vary across the proposed study area, resulting in likely variations in geotechnical properties that may be encountered. These variations could influence foundation conditions and design, drainage characteristics, excavatability of soils and rock masses, and the occurrence of problem soils. It is therefore vital that an intrusive geotechnical investigation be undertaken prior to the development of the proposed project to confirm the anticipated geotechnical conditions identified in this report.

The proposed project may affect the environment through increased soil erosion and the potential contamination of geological material. However, these impacts are expected to be 'very low' significance following proper mitigation. The dominant existing land use in the area is livestock farming, and it is therefore crucial that project-related impacts remain confined within the approved development footprints of proposed facility. Although impacts from neighbouring renewable energy facilities are expected to be similar to those of proposed project, the cumulative intensity of such impacts could increase if appropriate mitigation measures are not implemented. Properly designed and enforced mitigation measures across all developments will be essential to ensure that post-mitigation impact significance remains low. Nevertheless, the implementation of the recommended mitigation and monitoring measures during all phases of the project remains critical to minimise the intensity and extent of potential impacts.

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Based on the geotechnical assessment conducted, the specialist recommends that the proposed project be authorised, as no fatal flaws were identified during this desktop evaluation.

Traffic Impact Statement

The Traffic Impact Assessment (TIA) (refer to Appendix F.9) was undertaken by Iris Wink of iWink Consulting (Pty) Ltd, to inform the outcome of this BA from a traffic perspective.

The TIA found that the existing road network surrounding the proposed development is well established and provides an acceptable degree of mobility and access but require minor upgrades to achieve the required functionality. The proposed facility can be accessed using public roads R63 and MR00607. The MR00607 will lead construction vehicles from the R63 to the site.

The construction and decommissioning phases of the proposed project are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is of temporary nature in comparison to the operational period, i.e., the impact of the solar energy facility on the external traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network. The number of abnormal load vehicles was estimated and found to be able to be accommodated by the road network including the recommended mitigation measures.

During operation, it is expected that permanent staff will travel to site and periodically delivery of water for cleaning of panels may occur. It is expected that the generated trips can be accommodated by the external road network, and the impacts are rated very low. The traffic generated during the decommissioning phase will be similar to or even less than the construction phase traffic and the impact on the surrounding road network is considered to be of negative low impact with mitigation measures. For the cumulative impact, all approved or planned developments in a radius of 30 km from the project site were assessed for the impact rating, assuming a worst-case scenario in which they will be developed at the same time (which will in reality be unlikely). This would result in a negative high impact. A rating of a negative low impact was given with mitigation measures. Overall, no fatal flaws were identified, provided that the recommended mitigation measures are adhered to as far as possible.

It should be noted that changes to the internal layout of the facility, such as location of buildings, will not affect the traffic impact on the surrounding road network (as assessed in this report). These alternatives will have the same implications and are considered equally acceptable from a transport perspective.

The proposed project is therefore deemed acceptable from a traffic engineering perspective, provided the recommendations and mitigation measures in this report are implemented, and hence the 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 1020 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 of iSHEcon (Pty) Ltd and is included in Appendix F.10 of the BA Report.

Considering the nature of the project, the Project Applicant has required the assessment of all available BESS technologies that could be implemented so that the specific type/technology to be developed would be selected based on market demands and technology availability at the time of construction.

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Therefore, both Lithium-ion (or Sodium-ion) and Redox flow (e.g. Vanadium) are assessed as technology alternatives. The specific technology will only be determined following Engineering, Procurement and Construction (EPC) phase.

The assessment concluded that there are no fatal flaws associated with the proposed Megora Solar PV 2 Battery Energy Storage Facility for either technology type, although the exact location within the proposed development footprint can be optimized to reduce risks. Detailed suggestions for managing and reducing risks that are contained in the BESS Risk Assessment (Appendix F. 10 of this BA Report) have been incorporated into the EMPs and conditions for EA where necessary and applicable.

The assessment further 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. As such the latest battery designs should be considered during the EPC phase as they include many preventative and mitigative measures to reduce these risks to tolerable levels. In addition, the final design should be subject to a full Hazard and Operability Study (HAZOP) prior to commencement of procurement.

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 SHE perspective no fatal flaws were found with either type of technology 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.

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

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

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 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.

Alternatives

As noted above, in Section C of this BA report, the preferred activity alternative was determined to be the development of a renewable energy facility on site using solar PV as the preferred technology alternative. In terms of the preferred location of the site, a strategic site, location and development footprint identification process was followed, where the selection is informed by the environmental constraints identified through screening. This is based on the mitigation hierarchy approach of firstly trying to avoid impacts through careful siting. Therefore, it must be noted that different sites, location or development footprint alternatives are not ranked, but rather a strategic process was followed where sensitive features are screened out, in order to reach the preferred location or development footprint within the preferred site to ensure that the proposed developments would have the least possible overall negative impact. The specialists considered desktop data, field work, existing literature and the National Web-based Environmental Screening Tool to determine the site sensitivity. Based on this, a preferred layout for the solar PV facility was determined

The development footprint and buildable areas largely avoid the “no-go” sensitive features identified and mapped by the respective specialists, where relevant and applicable, as discussed in Section J of this BA Report. As noted above, in some cases, linear infrastructure traverse areas of high or very high sensitivity, however the relevant specialists have confirmed that this is acceptable with recommended mitigation measures. In addition, from a terrestrial biodiversity and species perspective, there is minor encroachment of non-linear infrastructure into provincial ESAs however the Terrestrial Biodiversity and Aquatic specialist have confirmed that impacts on such features will be negligible.

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 impact 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 C below provides a summary of the impact assessment for each phase of the proposed Megora PV 2 project **post mitigation for direct impacts**. Table D provides the same information for the **cumulative impacts for the proposed project**.

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Table C: Overall Impact Significance with the Implementation of Mitigation Measures for Direct Negative and Positive Impacts for the proposed project

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Visual	Low		Moderate		Low	
Heritage (Archaeology and Cultural Landscape)	Very Low	Low	Low		Very 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	Low		Very Low	Low	Very Low	Low
Aquatic Biodiversity and Species	Low		Low		Low	
Avifauna	Very Low	Moderate	Low	Very Low	Very Low	Moderate
Socio-Economic	Low		Low		Low	
Geohydrology	Very Low		Very Low		Very Low	
Geotechnical	Very Low		Very Low		Very Low	
Traffic	Low		Very Low		Low	
DIRECT POSITIVE IMPACTS						
Socio-Economic	Moderate		Moderate	High	Moderate	

As indicated in Table C, the majority of the **direct negative impacts** were rated with a **low to very low post mitigation impact significance** for all three phases, with only the Avifauna 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.

Table D: Overall Impact Significance with the Implementation of Mitigation Measures for Cumulative Negative and Positive Impacts for the proposed project

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

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

Based on Table D, 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 **Very High** significance for the construction and operational phase, and **high** for the decommissioning phase.

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 Megora PV 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, provided that mitigation is applied. Based on the findings of the detailed specialist assessments and technical studies, the proposed project is considered to have an overall Very Low to Moderate negative cumulative environmental impact, and an overall highly significant positive cumulative socio-economic impact (with the implementation of respective mitigation and enhancement measures).

In terms of cumulative impacts, all of the specialists have recommended that the proposed project receives EA if the recommended mitigation measures are implemented.

It is also important to note that the proposed projects are located within geographical areas that support the development of large-scale wind and solar energy developments (i.e., the Beaufort West REDZ) and are considered to be of strategic importance for large scale electricity transmission infrastructure (i.e., Central 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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Overall Environmental Impact Statement

Taking into consideration the findings of the BA Process, as well as location of the proposed **Megora PV 2** within the Beaufort West REDZ (REDZ 11) as well as 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 project receive EA in terms of the EIA Regulations promulgated under the NEMA.