

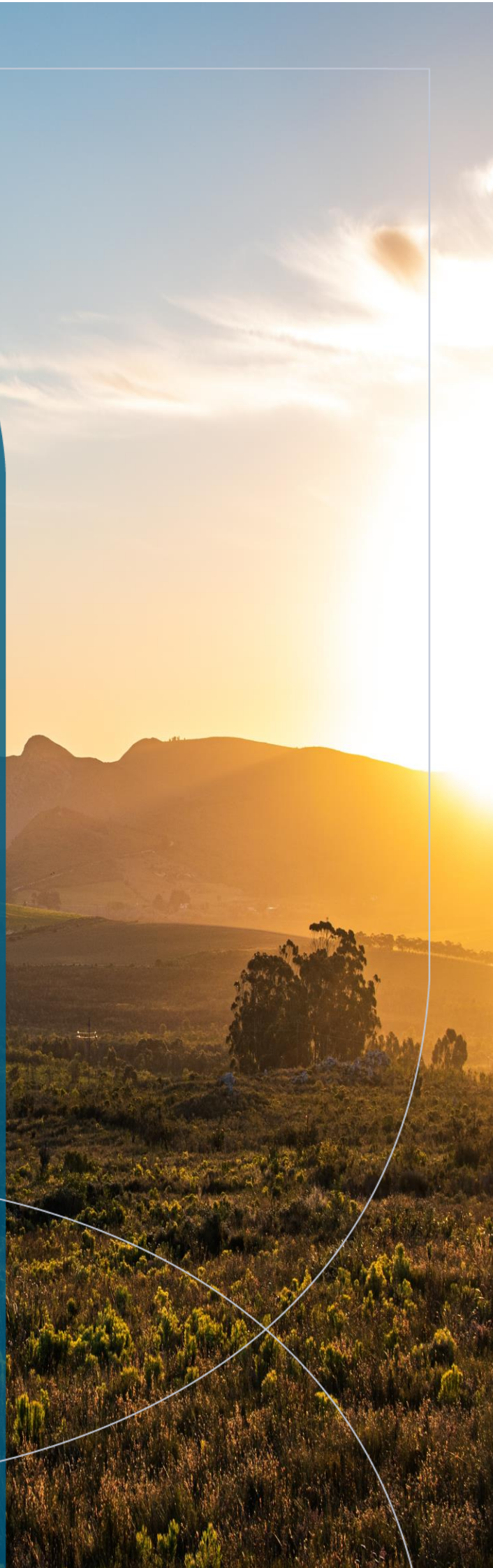
DRAFT EIA
REPORT

ENVIRONMENTAL
IMPACT
ASSESSMENT
PROCESS FOR
THE PROPOSED
MIRACH SOLAR
PV PROJECT
NEAR

10 OCTOBER 2023



BLUECRANE
ENVIRONMENTAL



PROJECT DETAILS

DFFE Reference Number	:	14/12/16/3/3/2/2359
Project Title	:	The Proposed Mirach Solar PV Project and Associated Infrastructure near Thabazimbi, Limpopo Province
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Applicant	:	Mirach Solar PV Project (Pty) Ltd
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GLOSSARY OF TERMS AND ACRONYMS

DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
GNR	Government Notice Regulation
I&AP	Interested and Affected Party
IAP	Invasive Alien Plant
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilo Volt
LILIO	Loop-In Loop-Out

LM	Local Municipality
Mitigate	Activities designed to compensate for unavoidable environmental damage.
MW	Megawatt
NEMA	National Environmental Management Act No. 107 of 1998
NERSA	National Energy Regulator of South Africa
NWA	National Water Act No. 36 of 1998
PAOI	Project Area of Influence
POSA	Plants of South Africa
PPP	Public Participation Process
PV	Photovoltaic
REIPPP	Renewable Energy Independent Power Producer Procurement Programme
SAHRA	South African Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
S&EIA	Scoping and EIA Process
VU	Vegetation Unit

INVITATION TO COMMENT

Mirach Solar PV Project (Pty) Ltd is proposing the development of a photovoltaic solar energy facility and associated infrastructure for the purpose of commercial electricity generation on an identified site located on Farm Newcastle No. 53, Registration Division KQ, Limpopo Province situated within the Thabazimbi Local Municipality, Waterberg District area of jurisdiction.

Blue Crane Environmental (Pty) Ltd has been appointed as the independent environmental consultant to undertake the required Environmental Impact Assessment Phase (EIA) as per the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

As the development of the Mirach Solar PV Project has the potential to result in negative impacts on the environment, Application for Environmental Authorisation (EA) must be made by the relevant decision-maker and in doing so to obtain Environmental Authorisation. The decision-making authority is the National Department of Forestry, Fisheries and the Environment (DFFE).

This is the draft EIA Report that has been made available for a 30-day review and comment period to all interested and/or affected parties (I&APs) to provide opportunity to raise comment and concern regarding the proposed development. The 30-day period is from **Tuesday, 10 October 2023 to Thursday, 09 November 2023**.

This report therefore represents the findings of the EIA Phase of the EIA process and contains the following sections and information:

- **Section 1: Introduction** - provides background to the development and the Scoping & EIA (S&EIA) process.
- **Section 2: Project and Development Footprint Description** - provides a description of all project related details, including alternatives and the process followed by the Applicant for site selection and layout design.
- **Section 3: Policy and Legislative Context** – provides a description of the policy and legislative context considering the proposed development, and also provides an indication of how the development responds to these aspects.

- **Section 4: Need and Desirability** - describes the need and desirability of the proposed development within the site and for the broader area.
- **Section 5: Approach to the Process** - outlines the approach followed in terms of the S&EIA Process.
- **Section 6: Public Participation Process** – outlines the approach followed in terms of the Public Participation Process.
- **Section 7: Description of the Affected Environment** - describes the current environment within which the development is proposed, including biophysical and socio-economic aspects.
- **Section 8: Impact Assessment** - provides an assessment of the potential impacts associated with the development and provides recommendations for the mitigation of significant impacts.
- **Section 9: Cumulative Impact Assessment** - provides an assessment of the potential cumulative impacts associated with the development and other developments and provides recommendations for the mitigation of significant impacts, where relevant.
- **Section 10: Development Footprint and Alternatives Analysis** – provides an analysis of the proposed development footprint considering the confirmed environmental sensitivities present and recommends the preferred development footprint put forward for EA. Furthermore, an analysis is provided of the alternatives proposed and assessed as well as a recommendation of the preferred alternatives.
- **Section 11: Conclusion** - presents the conclusions and recommendations based on the findings of the draft EIA Report.

EXECUTIVE SUMMARY

Mirach Solar PV Project (Pty) Ltd intends to develop a 340 MW photovoltaic (PV) solar facility and associated infrastructure on the Farm Newcastle No. 53, situated within the Thabazimbi Local Municipality, Waterberg District area of jurisdiction. The town of Thabazimbi is located approximately 55 km south of the proposed development.

Blue Crane Environmental (Pty) Ltd has been appointed to undertake the EIA Phase of the EIA Process for the proposed development. Activities required for the development of the solar PV facility which are listed under Listing Notice 1, 2 and 3 (GN.R. 327, 325 and 324) implies that the development could potentially have a significant impact on the environment that will require mitigation. Subsequently a thorough assessment process is required as described in Regulations 21-24 of the EIA Regulations to obtain Environmental Authorisation (EA).

The Application for EA and the S&EIA process was lodged by another Environmental Assessment Practitioner (EAP), known as Environamics Environmental Consultants. The Scoping Phase of the EIA process was completed by Environamics Environmental Consultants through the submission of the final Scoping Report. Subsequently, Blue Crane Environmental, has been appointed for the completion of the EIA Phase of the process. Both the Competent Authority (Department of Forestry, Fisheries and the Environment) and the registered I&APs for the development have been notified of the change accordingly, and have been provided with the details of where comments can be submitted and who to contact at Blue Crane Environmental regarding the development.

This is the draft EIA Report that has been made available to I&APs, stakeholders and the competent authority for a 30-day review and comment period. Sensitive environmental areas and features have been confirmed through the EIA Phase and provide an indication and confirmation of the sensitivity of the Mirach Solar PV Project development area as assessed during the Scoping Phase. The sensitivity has been ground-truthed by the respective specialists through the undertaking of appropriate field-surveys and investigation.

Following the completion of the Scoping Phase, and the Acceptance of the Scoping Phase and Plan of Study for the EIA (Appendix H) by the DFFE, the Applicant has undertaken the

design of the development footprint considering the results of the confirmed environmental sensitivities that need to be avoided and considered. The development footprint has been put forward for assessment as part of this draft EIA Report to test how appropriate the facility layout is, from an environmental perspective, when placed within the development area.

Based on the impact assessments, it has been predicted that the proposed development will have a net positive impact for the area and will subsequently ensure the optimal utilisation of resources and land. All negative environmental impacts can be effectively mitigated through the recommended mitigation measures and no residual negative impacts are foreseen. The potentially most significant environmental impacts associated with the development, as identified in this draft EIA Report, are briefly summarised below.

Predicted impacts during the construction phase:

During the construction phase negative impacts are foreseen over the short term. The latter refers to a period of up to 24 months. The potentially most significant impacts relate to habitat destruction caused by clearance of vegetation and socio-economic impacts such as the creation of direct and indirect employment opportunities, economic multiplier effects from the use of local goods and services and temporary increase in traffic disruptions and movement patterns.

Predicted impacts during the operational phase:

During the operational phase the site will serve as a solar PV facility and the potential impacts will take place over a period of 20 – 25 years. The negative impacts are generally associated with habitat destruction caused by clearance of vegetation which occurred during the construction phase, displacement of priority avian species from important habitats, collision and electrocutions of avifauna and visual impact of sensitive visual receptors occurring for motorists that drive past the Mirach Solar PV Project. The provision of sustainable services delivery also needs to be confirmed. The operational phase will have a direct positive impact through the creation of employment opportunities and skills development, development of non-polluting, renewable energy infrastructure and contribution to economic development and social upliftment.

Predicted impacts during the decommissioning phase:

The negative impacts generally associated with the decommissioning phase include: habitat destruction caused by clearance of vegetation and the loss of permanent employment.

However, skilled staff will be eminently employable, and a number of temporary jobs will also be created in the process. It is not expected that the facility will be decommissioned, but rather that the technology used will be upgraded.

Predicted cumulative impacts

Further to the above, cumulative impacts could arise as other similar projects are constructed in the area. According to the Department of Forestry, Fisheries and Environment (DFFE) database, no similar developments have been proposed in close proximity to the proposed activity.

From the results of the draft EIA Report, the opportunities to mitigate the significance of all impacts to an appropriate level, the absence of fatal flaws and the environmentally appropriate development footprint put forward by the Applicant for decision-making, it is recommended that approval of the Mirach Solar PV Project be granted, subject to the implementation of the recommended mitigation measures and conditions for EA listed in this draft EIA Report.

1 INTRODUCTION

Mirach Solar PV Project (Pty) Ltd intends to develop a 340 MW photovoltaic solar energy facility and associated infrastructure (including LILLO connection into existing Eskom infrastructure with an onsite substation and Battery Energy Storage System (BESS)) on the Farm Newcastle No. 53, situated within the Thabazimbi Local Municipality, Waterberg District Municipality, area of jurisdiction. The town of Thabazimbi is located approximately 55 km south of the proposed development (refer to Figure A and B for the locality and regional maps, as appended to this report).

A development area¹ / site of up to 747 hectares (including associated infrastructure) was identified and assessed as part of the Scoping Phase of the Environmental Impact Assessment (EIA) process, which was fully considered as part of the Scoping Report. The development area includes the entire extent of the affected property on which the Mirach Solar PV Project is located. Following confirmation during the Scoping Phase of the appropriateness of the development area to house a solar PV development footprint, the Applicant has designed and put forward a development footprint / facility layout of 650 ha. The full extent of this proposed development footprint, and associated alternatives, are fully considered and assessed within this draft EIA Report, as well as the respective independent specialist studies (Appendix E).

The project further entails a Loop-In-Loop-Out (LILLO) overhead power line connection between the on-site facility substation, switching station and BESS and into the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line. A 200 m wide and 13 km long grid connection corridor is under assessment for the placement of the overhead power line. The corridor runs parallel to the existing Thabazimbi Combined / Waterberg 1 132 kV overhead power line.

¹ The development area is defined as the area within the affected property under assessment for the placement of the development footprint which will house all infrastructure associated with the development. In this case the entire affected property has been considered and forms part of the development area. The development footprint will be defined within this draft EIA Report.

The development areas has been confirmed as being highly desirable due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., low agricultural potential, ecological sensitivity and archaeology), proximity to existing Eskom grid connection infrastructure, and proximity to the existing gravel roads off of the R510 Regional Road (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

1.1 Project Overview

For the development of the Mirach Solar PV Project specific infrastructure and key components are required to be constructed and operated to enable the generation of electricity through the use of photovoltaic technology. The main components are as follows:

- PV Panel Array, including mounting structures, to enable the generation of up to 340 MW of electricity.
- Inverters and cabling are required to connect the PV array and to enable the conversion of direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Battery Energy Storage System (BESS) / facilities required for the storage of generated electricity.
- Site and internal access roads (up to 12 m wide). Roads are required to access the site, as well as internally to access the various project components.
- Grid connection infrastructure including:
 - 33 kV cabling between the project components and the facility substations;
 - A Loop-In-Loop-Out (LILLO) connection with the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure;
 - A facility substation up to 132 kV;
 - A switching station up to 132 kV; and
 - A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure.
- Associated infrastructure is required in the form of auxiliary buildings (including basic services such as water and electricity). These include an operations and maintenance building / offices, switchgear and relay room, a gate house and security control, control centre, workshops for storage and maintenance, staff lockers and changing room.
- Temporary and permanent laydown areas are also required.

- Temporary batching plant for construction purposes.
- For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farms.

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other programmes/opportunities to generate power in South Africa or private offtake. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa's electricity mix. According to the 2021 State of the Nation Address, Government will be initiating the procurement of an additional 11 800 MW of power from renewable energy, natural gas, battery storage and coal in line with the Integrated Resource Plan (IRP) 2019 and fulfilling their commitments under the United Nations Framework Convention on Climate Change and its Paris Agreement which include the reduction of greenhouse gas emissions. Eskom, our largest greenhouse gas emitter, has committed in principle to net zero emission by 2050 and to increase its renewable capacity.

During the 2022 State of the Nation Address it was indicated that during the past year the government had taken "firm steps" to bring additional generation capacity online as quickly as possible to close the shortfall in terms of electricity. As a result, it was confirmed that several new generation projects will be coming online over the next few years. During the recent 2023 State of the Nation Address, the government has embarked upon allowing private developers to generate electricity. There are now more than 100 projects, which are expected to provide over 9 000 MW of new capacity over time. A number of companies that have participated in the renewable energy programme will soon enter construction and deliver a total of 2 800 MW of new capacity. Through the Just Energy Transition Investment Plan, R1.5 trillion will be invested in our economy over the next five years in new frontiers such as renewable energy, green hydrogen and electric vehicles. A number of projects are already underway, including the development of a new facility by Sasol at Boegoebaai in the Northern Cape, the Prieska Power Reserve in the Free State, and the Hydrogen Valley initiative in Limpopo, Gauteng and KwaZulu-Natal.

Therefore, in response to the above Mirach Solar PV Project (Pty) Ltd is proposing the development of the proposed photovoltaic solar energy facility and associated infrastructure (including grid connection infrastructure) for the purpose of commercial electricity generation.

1.2 Requirement for the Environmental Impact Assessment Process

The construction and operation of the Mirach Solar PV Project is subject to the requirements of the EIA Regulations, 2014 (as amended), published in terms of Section 24(5) of the National Environmental Management Act² (NEMA) 107 of 1998. NEMA provides for the authorisation of certain activities referred to as “listed activities”. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with such listed activities must be considered, investigated, assessed, and reported on to the Competent Authority (the decision-maker) charged by NEMA with granting of the relevant environmental authorisation.

The main listed activity triggered by the proposed facility is Activity 1 of Listing Notice 2 (GN.R. 325), which relates to the development of facilities or infrastructure for the generation of electricity from a renewable resource where the generating capacity is 20 megawatts or more. The photovoltaic solar facility will have a capacity of up to 340 MW. Table 1.1 below indicates all listed activities triggered in terms of the EIA Regulations and provides a project description in terms of the activity trigger.

Table 1.1: Listed Activities Applied For

Relevant notice:	Activity No (s)	Description of each listed activity as per project description:
GN.R. 327 (as amended)	Activity 11(i)	<ul style="list-style-type: none"> • <i>“The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts”.</i> • Activity 11(i) is triggered as the project entails the development of: <ul style="list-style-type: none"> ○ 33 kV cabling between the project components and the facility substations; ○ A Loop-In-Loop-Out (LILO) connection with the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure;

² NEMA is the national legislation that provides for the authorisation of certain controlled activities known as “listed activities”.

		<ul style="list-style-type: none"> ○ A facility substation up to 132 kV; ○ A switching station up to 132 kV; and ○ A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure.
GN.R. 327 (as amended)	Activity 12(ii)(a)(c)	<ul style="list-style-type: none"> • <i>“The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (a) within a watercourse or (c) within 32 meters of a watercourse measured from the edge of a watercourse.”</i> • Activity 12(ii)(c) is triggered as the site includes two depression wetlands. The development footprint is located within 32 m of the wetlands, but not within 15 m as per the recommendations of the wetland specialist. The total development footprint of the Mirach Solar PV Project will be 647 ha. Roads, cabling and piping may cross water courses (excluding the wetlands identified).
GN.R. 327 (as amended)	Activity 14	<ul style="list-style-type: none"> • <i>“The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.”</i> • The use of hazardous substances will form part of the construction phase. The substances anticipated to be used include cement powder associated with the concrete/brick works; petrol/diesel for trucks, cranes, bulldozers etc.; limited amounts of transformer oils. The dangerous goods will be stored during construction in a covered area/bin and disposed of at registered

		hazardous waste sites. The storage requirements will be up to 450 cubic metres.
GN.R. 327 (as amended)	Activity 19	<ul style="list-style-type: none"> • <i>“The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meter from a watercourse.”</i> • Activity 19 is triggered since roads, cabling and piping may cross water courses (excluding the wetlands identified). This may lead to the removal or moving of soil of approximately 20 cubic meters.
GN.R. 327 (as amended)	Activity 24(ii)	<ul style="list-style-type: none"> • <i>“The development of a road (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters”.</i> • Activity 24(ii) is triggered as the proposed access roads associated with Mirach Solar PV Project will be between 8 m and 12 m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity.
GN.R. 327 (as amended)	Activity 28(ii)	<ul style="list-style-type: none"> • <i>“Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare”.</i> • Activity 28(ii) is triggered as the total area to be developed for the PV facility and associated infrastructure is greater than 1 ha and occurs outside an urban area in an area currently zoned for agriculture. The property will be re-zoned to “special” use as per the municipal by-laws. The identified development area

		is up to 747 ha and will house a development footprint of up to 650 ha.
GN.R. 327 (as amended)	Activity 56(ii)	<ul style="list-style-type: none"> • <i>“The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre (ii) where no reserve exists, where the existing road is wider than 8 metres...”</i> • Activity 56(ii) is triggered as existing roads will require widening of up to 8 m and/or lengthening by more than 1 km, to accommodate the movement of heavy vehicles and cable trenching activities.
GN.R. 325 (as amended)	Activity 1	<ul style="list-style-type: none"> • <i>“The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more”.</i> • Activity 1 is triggered since the proposed solar photovoltaic facility will generate up to 340 megawatts of electricity through the use of a renewable resource.
GN.R. 325 (as amended)	Activity 15	<ul style="list-style-type: none"> • <i>“The clearance of an area of 20 hectares or more of indigenous vegetation.”</i> • Activity 15 is triggered as the cumulative area of indigenous vegetation to be cleared for the entire Project (excluding linear components) will exceed 20 hectares. The identified development area is up to 747 ha and will house a development footprint of up to 650 ha.
GN.R. 324 (as amended)	Activity 4 (e)(i)(ee)(gg)	<ul style="list-style-type: none"> • <i>“The development of a road wider than 4 metres with a reserve less than 13,5 metres within (e) Limpopo (i) Outside urban areas, in (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans, and within (gg) Areas within 10 Kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or</i>

		<p><i>from the core areas of a biosphere reserve, excluding disturbed areas.”</i></p> <ul style="list-style-type: none"> Activity 4(e)(i)(ee)(gg) is triggered as the proposed access roads associated with Mirach Solar PV Project will be between 8 m and 12 m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold of this activity. <p>The Mirach Solar PV Project is located within the Limpopo Province, outside of urban areas. The grid connection corridor assessed for the placement of the overhead power line traverses both a CBA 1 and a CBA 2. Furthermore, the site is located within 5 km of three Private Nature Reserves, namely the Oom Karel Private Nature Reserve (located directly to the east), the Rooiboschbult Private Nature Reserve (located directly to the east), the Kastrol Private Nature Reserve (located ~2,3 km to the northeast) and the Nuwe Hoop Private Nature Reserve (located ~3,7 km to the southwest).</p>
GN.R. 324 (as amended)	Activity 12 (e)(ii)	<ul style="list-style-type: none"> <i>“The clearance of an area of 300 square metres or more of indigenous vegetation (e) Limpopo (ii) Within critical biodiversity areas identified in bioregional plans.”</i> Activity 12 (e)(ii) is triggered since the project is located within the Limpopo Province. The grid connection corridor assessed for the placement of the overhead power line traverses both a CBA 1 and a CBA 2 and therefore clearance of just over 300 square metres will be required within the CBA areas for the placement of the power line pylons and for the power line service road.
GN.R. 324 (as amended)	Activity 14(ii)(c)(e)(i)(ff) (hh)	<ul style="list-style-type: none"> <i>“The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more, where such development occurs (c) within 32 metres of a watercourse, measured from the edge of a watercourse,</i>

		<p><i>within (e) Limpopo, (i) Outside urban areas, within (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans and (hh) areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.”</i></p> <ul style="list-style-type: none"> Activity 14(ii)(c)(e)(i)(ff)(hh) is triggered as the site includes two depression wetlands. The development footprint is located within 32 m of the wetlands, but not within 15 m as per the recommendations of the wetland specialist. The total development footprint of the Mirach Solar PV Project will be 647 ha. <p>The Mirach Solar PV Project is located within the Limpopo Province, outside of urban areas. The grid connection corridor assessed for the placement of the overhead power line traverses both a CBA 1 and a CBA 2. Furthermore, the site is located within 5 km of three Private Nature Reserves, namely the Oom Karel Private Nature Reserve (located directly to the east), the Rooiboschbult Private Nature Reserve (located directly to the east), the Kastrol Private Nature Reserve (located ~2,3 km to the northeast) and the Nuwe Hoop Private Nature Reserve (located ~3,7 km to the southwest).</p>
<p>GN.R. 324 (as amended)</p>	<p>Activity 18 (e)(i)(ee)(gg) (hh)</p>	<ul style="list-style-type: none"> <i>“The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre, in (e) Limpopo, (i) Outside urban areas, within (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted the Competent Authority or in bioregional plans, wihtin (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere</i>

		<p><i>reserve, and within (hh) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland.”</i></p> <ul style="list-style-type: none"> • Activity 18(e)(i)(ee)(gg)(hh) is triggered as existing roads will require widening of up to 8 m and/or lengthening by more than 1 km, to accommodate the movement of heavy vehicles and cable trenching activities. <p>The Mirach Solar PV Project is located within the Limpopo Province, outside of urban areas. The grid connection corridor assessed for the placement of the overhead power line traverses both a CBA 1 and a CBA 2. Furthermore, the site is located within 5 km of three Private Nature Reserves, namely the Oom Karel Private Nature Reserve (located directly to the east), the Rooiboschbult Private Nature Reserve (located directly to the east), the Kastrol Private Nature Reserve (located ~2,3 km to the northeast) and the Nuwe Hoop Private Nature Reserve (located ~3,7 km to the southwest). Furthermore, the site includes two depression wetlands. The development footprint is located within 32 m of the wetlands, but not within 15 m as per the recommendations of the wetland specialist.</p>
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Appendix 3 of the EIA Regulations, 2014 (as amended), contains the objectives to be achieved through the undertaking of an environmental impact assessment process. The following objectives have been considered, undertaken and achieved through a consultative process within this draft EIA Report for the Mirach Solar PV Project:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the development footprint on the approved site as contemplated in the accepted scoping report;

- Identify the location of the development footprint within the approved site as contemplated in the accepted scoping report based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- Determine the –
 - Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform the identified preferred alternatives; and
 - Degree to which these impact –
 - Can be reversed;
 - May cause irreplaceable loss of resources, and
 - Can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the development footprint of the approved site as contemplated in the accepted scoping report based on the lowest level of environmental sensitivity identified during assessment;
- Identify, assess and rank the impacts the activity will impose on the development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate the identified impacts; and
- Identify residual risks that need to be managed and monitored.

1.3 Details of the Environmental Assessment Practitioner and Independent Specialists

In accordance with Regulation 12 of the 2014 EIA Regulations (GN.R. 326), Mirach Solar PV Project (Pty) Ltd has appointed Blue Crane Environmental (Pty) Ltd (Blue Crane Environmental) as the independent Environmental Assessment consultant to complete the Environmental Impact Assessment process and prepare the draft EIA Report for the proposed development. Neither Blue Crane Environmental nor any of the appointed independent specialists are subsidiaries of, or are affiliated to Mirach Solar PV Project (Pty) Ltd.

Regulation 13(1)(a) and (b) requires that an independent and suitably qualified and experienced Environmental Assessment Practitioner (EAP) must conduct the Scoping and EIA (S&EIA) process. In terms of the independent status of the EAP a declaration is attached as Appendix A to this report. The expertise of the EAP is also summarised in the curriculum vitae included as part of Appendix A.

The details of the Registered EAP are as follows:

Table 1.2: Details of the Registered EAP

Contact Person:	Lisa de Lange
EAPASA Registration:	2020/2150
Telephone:	+27 (84) 920-3111
Electronic Mail:	lisa@bcrane.co.za
Contact Person:	Roschel Maharaj (co-author)
EAPASA Registration:	2019/824
Telephone:	+27 (63) 062-7725
Electronic Mail:	roschel@bcrane.co.za

Regulation 13(1)(a) and (b) determines that independent and suitably qualified, experienced and independent specialists should conduct the specialist studies, in the event where the specialist is not independent, a specialist should be appointed to externally review the work of the specialist as contemplated in sub regulation (2), must comply with sub-regulation 1. In terms of the independent status of the specialists, their declarations are attached as Appendix E9 to this report. The expertise of the specialists is summarised in their respective reports.

Refer to Table 1.3 for the details of the independent specialists.

Table 1.3: Details of the Independent Specialists

Study	Prepared by	Contact Person
Terrestrial Ecology Baseline and Impact Assessment	The Biodiversity Company	Rudolph Greffrath and Andrew Husted
Wetland Baseline and Risk Assessment	The Biodiversity Company	Rian Pienaar and Andrew Husted
Avifaunal Impact Assessment	The Biodiversity Company	Ryno Kemp and Andrew Husted
Soil and Agricultural Compliance Statement	The Biodiversity Company	Maletsatsi Mohapi and Andrew Husted
Visual Impact Assessment	Donaway Environmental	Johan Botha
Social Impact Assessment	Donaway Environmental	Johan Botha
Heritage Impact Assessment	J van Schalkwyk Heritage Consultant	J van Schalkwyk
Palaeontological Desktop Assessment	Banzai Environmental	Elize Butler

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable to this draft EIA Report:

- It is assumed that all information provided by the Applicant and I&APs to Blue Crane Environmental is correct and valid at the time it was provided.
- It is assumed that the development area identified by the Applicant, and approved by the DFFE as part of the Scoping Phase, is a technically suitable site for the establishment of the Mirach Solar PV Project and associated infrastructure.
- It is assumed that the Applicant has consulted / is in the process of consulting with Eskom in terms of connection into existing Eskom infrastructure for the evacuation of the generated power.
- Conclusions of independent specialist studies undertaken and this draft EIA Report assume that any potential impacts on the environment associated with the proposed development will be avoided, mitigated, or offset by the careful design and optimisation of the facility layout and through the implementation of recommended mitigation and management measures.
- It is assumed that the Applicant will consider and avoid all sensitive areas and environmental features not conducive for the placement of infrastructure through consultation and an iterative process between the Applicant and the EAP.
- This draft EIA Report and its investigations/ results are project-specific, and therefore no other power generation alternatives / technologies have been considered as part of this EIA process.

Refer to the specialist studies provided in Appendices E1-E8 for limitations specific to the independent specialist studies.

1.5 Legal Requirements Complied with in Section 1 as per the Requirements of the EIA Regulations, 2014 (as amended)

This draft EIA Report has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998). This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(a) the details of the (i) EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details of the EAP who prepared the report and the expertise of the EAP is included in section 1.3. The curriculum vitae of the EAP is included in Appendix A.
3(1)(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered.	All listed activities triggered by the development are included in Table 1.1 of section 1.2.
3(1)(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed.	A description of the assumptions, uncertainties and gaps in knowledge are included in section 1.4 and the respective specialist studies included in Appendix E.
3(1)(s) 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	The Declaration of the EAP and undertaking under oath is included in Appendix A as per the most recent DFFE template.

inputs made by interested or affected parties.	
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2 PROJECT AND DEVELOPMENT FOOTPRINT DESCRIPTION

This section provides the details of the project proposed including the project infrastructure, the draft layout proposed for assessment and development and alternatives associated with the draft layout. Furthermore, the section considers the site selection process in terms of the development footprint and approach undertaken by the Applicant for the Mirach Solar PV Project and associated infrastructure.

2.1 Location of the Proposed Development Footprint

A development area of 747 ha identified within the affected property was assessed fully during the Scoping Phase for the placement of the development footprint which will ultimately house the Mirach Solar PV Project and associated infrastructure. The DFFE approved the Scoping Report and thereby essentially approved the undertaking of the assessment of placement of a development footprint within the development area based on the opportunities it presents to put forward an environmentally appropriate facility layout.

The details of the location is included in Table 2.1 below, which included the location information related to the proposed grid connection infrastructure.

Table 2.1: General Site and Location Information

Description of affected farm portions	<p><u>Solar PV Facility:</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53 <p><u>LILO Grid Connection Corridor:</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53 • Portion 1 of the Farm Klippan No. 52 kQ • Farm Grootfontein No. 704 • Farm Welgevonden No. 949 • Remainder of Farm Rooiboschbult No. 47 • Portion 11 of Farm Welgevonden No. 16
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	<p><u>Access Road (existing road to possibly be widened):</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53
Province	Limpopo
Local Municipality	Thabazimbi LM
District Municipality	Waterberg DM
Ward numbers	1
Closest towns	The town of Thabazimbi is located approximately 55 km south of the proposed development.
21 Digit Surveyor General codes	<p><u>Solar PV Facility:</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53 TOKQ00000000005300000 <p><u>LILO Grid Connection Corridor:</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53 TOKQ00000000005300000 • Portion 1 of the Farm Klippan No. 52 kQ TOKQ00000000005200001 • Farm Grootfontein No. 704 TOKQ000000000070400000 • Farm Welgevonden No. 949 TOKQ000000000094900000 • Remainder of Farm Rooiboschbult No. 47 TOKQ00000000004700000 • Portion 11 of Farm Welgevonden No. 16 TOKQ00000000001600000 <p><u>Access Road (existing road to possibly be widened):</u></p> <ul style="list-style-type: none"> • Farm Newcastle No. 53

	TOKQ000000000005300000
Area under assessment (development area assessed and approved in the Scoping Phase)	747 ha
Development footprint (footprint associated with the facility layout)	650 ha
Photographs of the site	Included in the Plates as an appendix to the Report

Following the completion of the Scoping Phase the Applicant set out in designing a draft layout / development footprint within the fully assessed development area which considers the confirmed environmental sensitivities identified by the independent specialists through field surveys and ground-truthing. The approved Scoping Phase / report confirmed the suitability of the development area (including the grid connection corridor) from an environmental and social perspective to enable the identification of a suitable draft development footprint that is assessed in detail within this draft EIA Report.

The property on which the facility is to be constructed will be leased by Mirach Solar PV Project (Pty) Ltd from the property owner for the life span of the project (minimum of 25 years).

The area surrounding the Mirach Solar PV Project is characterised mostly by a low number of farmsteads/ buildings that are sparsely populated. The area is located in the agricultural region of the area with livestock and game farming the most prominent activities. The area surrounding the development is low in development and features cattle and game farming. The proposed development is also situated in a serene Bushveld setting that is renowned for its tranquillity. The area is a popular destination for tourists who are drawn to hunting and the complete safari experience. Additionally, the region also attracts international hunters seeking an authentic African hunting experience. Although the project is in close proximity to private nature reserves, these reserves are mainly used for hunting and livestock farming.

Refer to plates 1 – 8 for photographs of the affected property and the assessment / development area within which the development footprint is proposed to be located.

2.2 Details of the Infrastructure Proposed

The proposed development footprint associated with Mirach Solar PV Project includes specific infrastructure that will be developed as part of the facility layout.

The infrastructure to be developed is specifically related to the preferred technology to be installed to generate electricity from the solar resource, which in this case is photovoltaic. Photovoltaic solar energy is obtained by converting sunlight into electricity using a technology based on the photoelectric effect³. It is a type of renewable, inexhaustible and non-polluting energy that can be produced in installations ranging from small generators for self-consumption to large photovoltaic plants.

The design of the detailed layout / development footprint has been an iterative process between the Applicant, the relevant independent specialists and the EAP to provide guidance and understanding to the Applicant in the designing process to adhere to the limitations of the development area and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site– refer to Figure C. The total surface area proposed for the layout includes the PV panel arrays (spaced to avoid shadowing), access and maintenance roads and associated infrastructure (buildings, power inverters, power lines, battery energy storage systems, on-site substation and switching station and perimeter fences).

Table 2.2 below provides the technical details of the Mirach Solar PV Project as per the draft development footprint proposed.

Table 2.2: Technical Details of the proposed infrastructure for the Mirach Solar PV Project

Component	Description / dimension
Type of technology	Photovoltaic solar facility
Generation capacity	Up to 340 MW

³ The photoelectric effect is the emission of electrons or other free carriers when light shines on a material. Electrons emitted in this way can be called photo electrons.

Area of the PV Array	Up to 600 ha. Within the development footprint the PV Array has been designed into three separate sections which make up the entire facility.
Structure orientation	<p>Monofacial or Bifacial PV panels will be utilised. The panels will either be fixed to a single-axis and/or double horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.</p> <p>PV panels with single axis tracking are preferred over fixed-axis or double axis tracking systems due to the potential to achieve higher annual energy yields whilst minimising the balance of system (BOS) costs, resulting in the lowest levelized cost of energy (LCOE). The development of the PV facility will take into consideration during the final design phase the use of either tracker vs fixed-tilt mounting structures. Both options are considered feasible for the site.</p>
Structure Height	<ul style="list-style-type: none"> • PV Panels up to 6 m • Buildings up to 12 m • Power line up to 30 m • Fencing up to 3 m
Area of the Battery Storage	<p>Within a 1 ha area of the development footprint or spread out within the facility next to the inverters and in between the panel arrays (which is referred to as BESS Local).</p> <ul style="list-style-type: none"> • Alternative 1 (preferred): Located centrally next to the facility substation to the south of the site – Up to 1 ha. • Alternative 2: Located centrally next to the facility substation to the north of the site – Up to 1 ha.

	<ul style="list-style-type: none"> Alternative 3: Placed or spread out within the PV array area (referred to as BESS Local).
Capacity of the Battery Storage	Unspecified. To be confirmed prior to construction.
Area of the facility substation and switching station	<ul style="list-style-type: none"> On-site facility substation (collector): up to 2 ha Switching Station (Eskom): up to 2 ha
Capacity of the facility substation and switching station	<ul style="list-style-type: none"> On-site facility substation (collector): 132 kV Switching Station (Eskom): 132 kV
Cabling	33 kV cabling between the project components and the facility substations to be laid underground.
Laydown area dimensions	Temporary laydown areas will occupy a cumulative area of up to 5 ha scattered across the development footprint while 1 ha will remain in place for the permanent laydown areas as required for facility operation. Temporary laydown areas will be rehabilitated with topsoil and allowed to grow naturally.
Area occupied by buildings	Operations and Maintenance Building/Office; switchgear and relay room; staff lockers and changing room; security control; and offices: Up to 0.5 ha
Length of grid connection corridor	Up to 13 km
Width of grid connection corridor	200 m
Capacity of the power line	Single or double circuit line with a capacity of 132 kV
Width of the power line servitude	Up to 36 m
Width of internal roads	Up to 12 m wide
Length of internal roads	Up to 40 km in total

Storage and handling of dangerous goods	The use of hazardous substances will form part of the construction phase. The substances anticipated to be used include cement powder associated with the concrete/brick works; petrol/diesel for trucks, cranes, bulldozers etc.; limited amounts of transformer oils. The dangerous goods will be stored during construction in a covered area/bin and disposed of at registered hazardous waste sites. The storage requirements will be up to 450 cubic metres.
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A draft development footprint providing details of the facility layout and associated infrastructure has been provided by the Applicant for assessment as part of the EIA Phase. The draft layout shows the development footprint of 650 ha with an indication of the placement of the PV Panel Array, grid infrastructure, roads and auxiliary infrastructure such as substation and switching station, buildings, BESS and laydown areas. Refer to Figure 2.1 below.

This draft development footprint / layout will be optimised throughout the EIA Phase to enable the consideration and avoidance of all sensitive environmental features and areas present within the development area and thereby provide an opportunity to holistically consider all sensitivities and design an environmentally appropriate development footprint / facility layout to be put forward for the decision on the Application for Environmental Authorisation.

The coordinates associated with Mirach Solar PV Project draft layout and the specific project components, such as substations and BESS is provided in Table 2.3.

Table 2.3: Coordinates of the proposed Mirach Solar PV Project Development Footprint

Coordinates			
Development Footprint (650 ha)	A	24° 6'52.26"S	27°18'54.28"E
	B	24° 6'49.36"S	27°19'2.67"E
	C	24° 8'28.26"S	27°19'43.96"E
	D	24° 8'32.11"S	27°19'40.94"E
	E	24° 8'39.32"S	27°19'45.57"E
	F	24° 8'39.35"S	27°19'48.65"E
	G	24° 8'55.02"S	27°19'55.20"E

	H	24° 8'56.34"S	27°19'55.67"E
	I	24° 8'50.98"S	27°20'11.26"E
	J	24° 9'23.03"S	27°20'28.40"E
	K	24° 9'58.12"S	27°18'52.85"E
	L	24° 9'18.14"S	27°18'53.14"E
	M	24° 9'10.22"S	27°19'15.96"E
	N	24° 9'16.83"S	27°19'20.59"E
	O	24° 9'16.87"S	27°19'25.39"E
	P	24° 9'7.50"S	27°19'24.35"E
	Q	24° 8'37.92"S	27°19'9.93"E
	R	24° 8'34.72"S	27°19'8.55"E
	S	24° 8'36.77"S	27°18'53.51"E
Development Area (747 ha)	A	24° 6'51.82"S	27°18'53.49"E
	B	24° 6'48.43"S	27°19'3.11"E
	C	24° 8'54.21"S	27°19'55.71"E
	D	24° 8'48.82"S	27°20'10.82"E
	E	24° 9'23.36"S	27°20'29.47"E
	F	24° 9'59.13"S	27°18'52.06"E
On-site Facility Substation (Preferred Alternative)	A	24° 9'0.19"S	27°19'21.62"E
	B	24° 8'57.81"S	27°19'28.39"E
	C	24° 9'3.17"S	27°19'30.54"E
	D	24° 9'5.54"S	27°19'23.73"E
On-site Facility Substation (Alternative 1)	A	24° 8'29.47"S	27°19'2.93"E
	B	24° 8'28.20"S	27°19'10.15"E
	C	24° 8'33.86"S	27°19'11.33"E
	D	24° 8'35.13"S	27°19'4.11"E
Switching Station	A	24° 9'0.19"S	27°19'21.62"E
	B	24° 8'57.81"S	27°19'28.39"E
	C	24° 9'3.17"S	27°19'30.54"E
	D	24° 9'5.54"S	27°19'23.73"E
BESS Central (Preferred Alternative)	A	24° 8'57.62"S	27°19'29.12"E
	B	24° 8'56.77"S	27°19'31.66"E
	C	24° 8'59.86"S	27°19'32.95"E
	D	24° 9'0.74"S	27°19'30.40"E

BESS Central (Alternative 1)	A	24° 8'28.13"S	27°19'10.83"E
	B	24° 8'27.64"S	27°19'13.51"E
	C	24° 8'30.90"S	27°19'14.20"E
	D	24° 8'31.38"S	27°19'11.54"E
Grid Connection Corridor (200m wide and 13 km long)			
Start	A	24° 8'31.95"S	27°19'10.94"E
Bend point	B	24° 8'31.52"S	27°19'13.56"E
Bend point	C	24° 8'36.74"S	27°19'14.74"E
Bend point	D	24° 8'37.91"S	27°19'9.25"E
Middle	E	24° 9'7.15"S	27°19'23.86"E
Bend point	F	24° 7'4.11"S	27°25'16.64"E
Bend Point	G	24° 7'18.38"S	27°25'19.57"E
End	H	24° 7'18.18"S	27°25'20.25"E

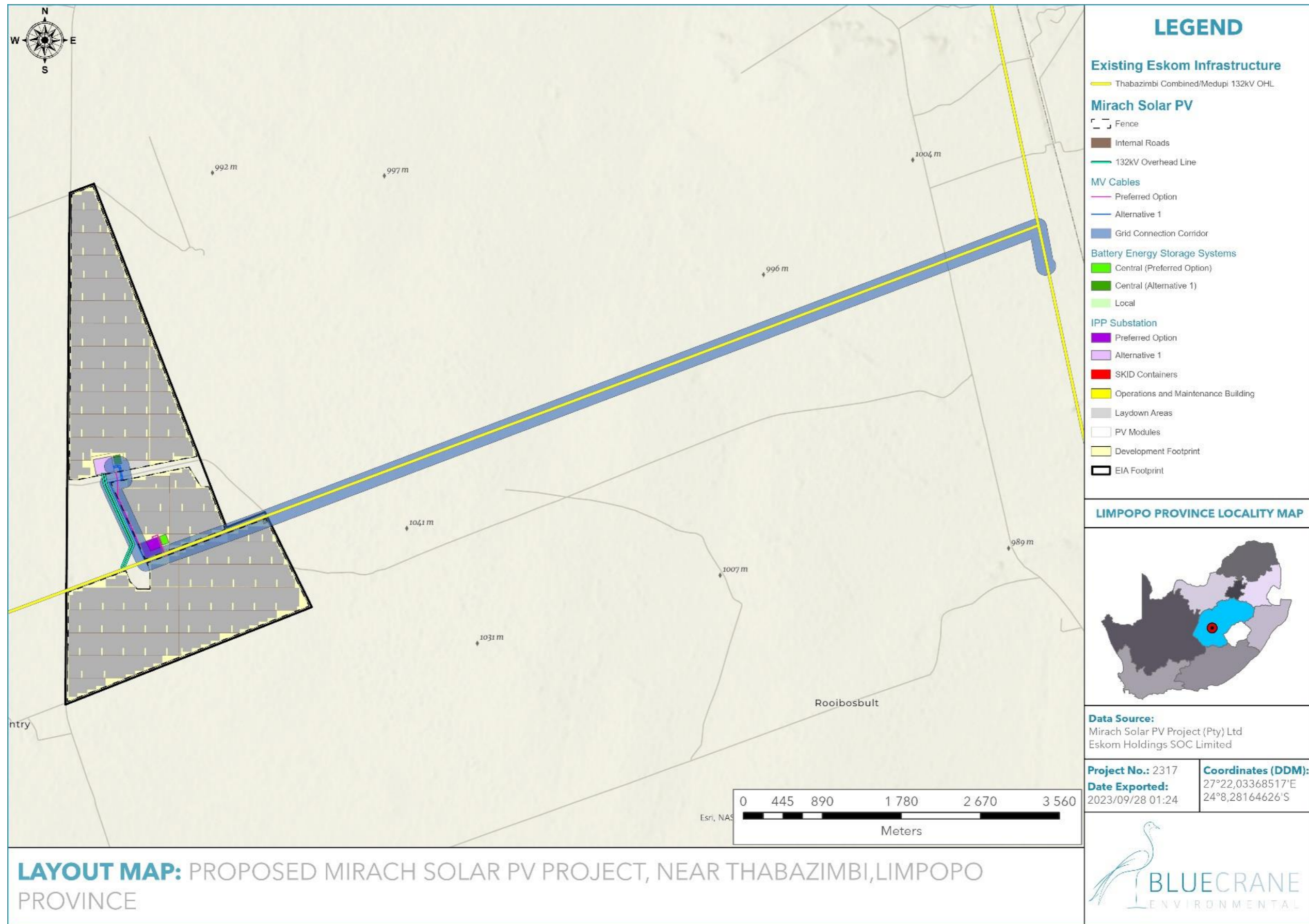


Figure 2.1: Draft Layout Plan for the Mirach Solar PV Project assessed as part of this draft EIA Report

2.3 Development Footprint Identification and Selection Process

As part of the Scoping Phase of the Mirach Solar PV Project, Environamics Environmental Consultants undertook a site selection process to understand which aspects and characteristics of the approved site / development area were relevant to the development from an environmental and technical perspective.

The process undertaken by the Applicant for the identification of the preferred site / development area was through an investigation of prospective sites and properties in the Thabazimbi area. The investigation involved the consideration of specific characteristics within the Limpopo Province and specifically within the Thabazimbi area. The characteristics considered were identified by the Applicant as the main aspects that play a role in the opportunities and limitations for the development of a photovoltaic solar facility. The characteristics considered, and the results thereof, are discussed in the sections below, which were sourced from the draft Scoping Report compiled by Environamics Environmental Consultants (June 2023). The Applicant considered that should these characteristics not be favourable for the development of a solar facility, then some limitations and challenges may be expected for the development. Characteristics considered includes:

Climatic Conditions - Climatic conditions determine if the project will be viable from an economic perspective as the Solar PV facility is directly dependent on the annual direct solar irradiation values of a particular area. The Limpopo Province receives high averages of direct normal and global horizontal irradiation daily. This is an indication that the regional location of the project includes a low number of rainy days and a high number of daylight hours experienced in the region. The Global Horizontal Radiation value is between 2050 – 2118 kWh/m² per annum is relevant in the area. See Figure 2.2.

Topographic conditions – The surface area on which the proposed facility will be located has a favourable level topography, which facilitates work involved with construction and maintenance of the facility and ensures that shadowing on the panels does not occur. The topographic conditions, which are favourable, minimises the significance of the impact that will occur during the clearing and levelling of the site for the construction activities.

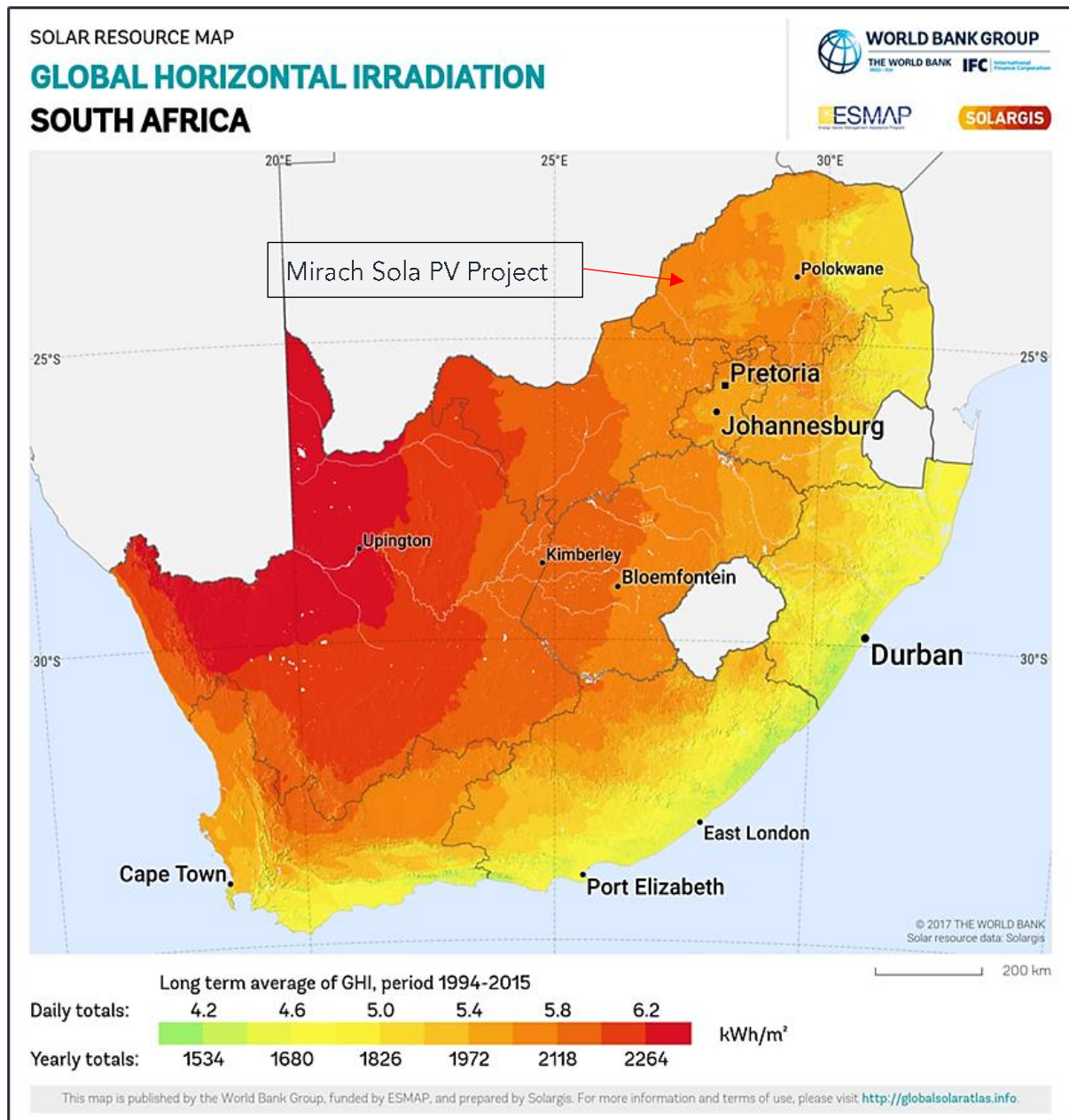


Figure 2.2: Global Horizontal Irradiation Values for South Africa (Solar GIS, 2021) and Mirach Solar PV Project

Extent of the site - A significant portion of land is required to evacuate up to 340 MW and space is a constraining factor in PV facility installations. Provision was made to assess a larger area than is required for the facility to make provision for any other environmental or technical constraints that may arise and to avoid those areas. Larger farms are sought after to make provision for any constraints imposed by the Department of Agriculture on the extent of land that may be used for such facilities per farm, as well as the opportunities presented for the avoidance of sensitive environmental features present. The Farm Newcastle No. 53, and the development area assessed therein is considered to provide an opportunity for the successful

construction and operation of a solar PV facility with a capacity of up to 340 MW, as well as opportunities for the avoidance and mitigation of impacts on the affected environment and sensitive environmental features.

Site availability and access - The land is available for lease by the developer. Reluctant farm owners or farmers over capitalizing, hamper efforts to find suitable farms. Access to the site is most likely to be obtained via existing roads just off the R510 Regional Road.

Grid connection - In order for the PV facility to connect to the national grid the facility will have to construct an on-site collector substation, Eskom switching station and a power line from the project site to existing Eskom infrastructure. Available grid connections are becoming scarce and play a huge role when selecting a viable site. The proposed Mirach Solar PV Project overhead power line route will connect via a Loop-In-Loop-Out (LILO) connection into existing Eskom infrastructure.

Environmental Sensitivities – From an environmental perspective the proposed site is considered highly desirable in terms of geology, agricultural potential, vegetation and landscape features, climate, biodiversity and the visual landscape despite some of the environmental sensitivities identified. The area proposed for development exclusively consists of land used for agriculture i.e., cattle and game farming, but wetland features are located within the PAOI, as well as a crop field within the PAOI. These environmental sensitive features will need to be considered by the developer for the placement of the facility infrastructure within the development footprint.

The Scoping Report concluded that the Farm Newcastle No. 53, may be considered favourable and suitable in terms of the site and environmental characteristics. No alternative areas on the affected property have been considered for the placement of the development footprint as the assessed development footprint will aim to avoid areas that are of high environmental sensitivity within the affected property. The development footprint of this project will cover a significant portion of the farm; however, provision will be made to exclude any sensitive areas from the facility layout to be developed within the development footprint.

The approach applied by the Applicant as part of the EIA Phase in terms of the development footprint identification for the Mirach Solar PV Project demonstrates due consideration of the sustainability of the development area for the placement of the solar facility, which is in line with a typical mitigation hierarchy (Figure 2.3). The hierarchy is as follows:

1. First Mitigation: avoidance of adverse impacts as far as possible by use of preventative measures (in this instance a sensitivity analysis assisted in the avoidance of identified sensitive areas)
2. Second Mitigation: minimisation or reduction of adverse impacts to 'as low as practicable' through implementation of mitigation and management measures
3. Third Mitigation: remedy or compensation for adverse impacts, which are unavoidable and cannot be reduced further.

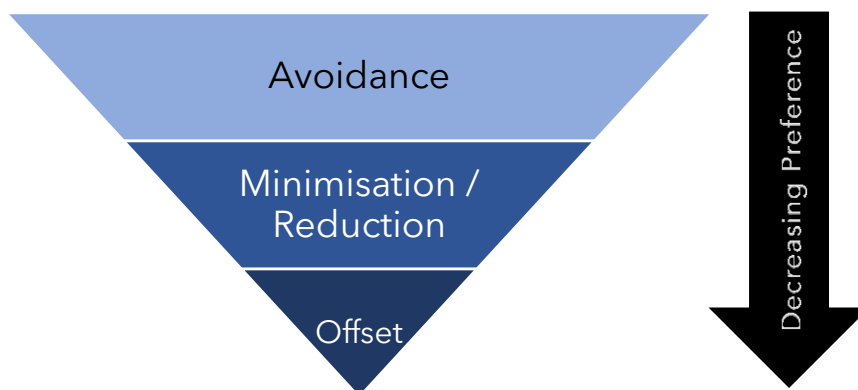


Figure 2.3: Typical mitigation hierarchy

In order to apply the mitigation hierarchy to the design of the development footprint the Applicant was supplied with the spatial data of the Scoping phase environmental sensitivities which is based on the desktop specialist findings as well as the confirmed and ground-truthed sensitivities that have been identified following the completion of the field surveys by the independent specialists. The proposed development footprint that has subsequently been designed has been submitted to all relevant independent specialists that have assessed the proposed development footprint against the confirmed sensitive environmental aspects and features present (Appendix E). The identification of the preferred development footprint alternatives is further discussed in section 2.4 below.

2.4 Alternatives Under Assessment considering the Development Footprint

This section describes the alternatives under consideration for the Mirach Solar PV Project EIA Phase. In terms of the Regulations only 'feasible' and 'reasonable' alternatives should be considered for development. The process undertaken by the Applicant for the identification of alternatives has been an iterative process and will continue to be an iterative process between the EAP and the Applicant in order to ensure that the preferred alternative proposed for authorisation is ultimately appropriate from a technical feasibility perspective as well as

an environmental perspective. Refer to Table 2.4 for an overview of the alternatives being considered.

Table 2.4: Summary of the Alternatives Considered

Alternatives considered	Description of the Alternative relating to the development
Site specific and Layout Alternatives	<p>One preferred site / development area has been identified for the development of the Mirach Solar PV Project based on specific site characteristics such as the solar resource, land availability, topographical characteristics and environmental features. The development area of 650 ha is considered to be sufficient for the development of a solar facility with a contracted capacity of up to 340 MW and has been approved for assessment of the placement of a development footprint as part of the Scoping Phase.</p> <p>The Applicant has provided a draft development footprint / facility layout for assessment by the specialists and as part of this draft EIA Report and will undertake an optimisation process of the footprint where it is found to be infringing into sensitive environmental features or areas not appropriate for disturbance of the placement of infrastructure.</p>
Activity Alternatives	<p>Only the development of a renewable energy facility is considered by Mirach Solar PV Project (Pty) Ltd. Due to the location of the site / development area and the suitability of the solar resource, only the development of a solar PV facility is considered feasible considering the natural resources available to the area and the current land-use activities undertaken within the site (i.e., agricultural and mining activities). Therefore, no other activity alternatives are relevant or under consideration.</p>
Technology Alternatives	<p>Only the development of a photovoltaic solar facility is considered due to the characteristics of the site, including the natural resources available. Therefore, no other technology alternatives are relevant or under consideration.</p>

<p>Grid Connection Alternatives</p>	<p>Energy generated by the facility will be evacuated into the National Grid via a 132 kV Loop-In-Loop-Out (LILO) connection into the existing Eskom Thabazimbi Combined / Waterberg 132 kV overhead power line infrastructure. A 200 m wide and up to 13 km long grid connection corridor will be assessed for placement of the grid connection infrastructure. The final grid route will be based on feedback provided by the Eskom Grid Access Unit as the process advances.</p>
<p>Substation Location Alternatives</p>	<p>Within the proposed development footprint the Applicant has identified two (2) potential locations for the placement of the substation. Both locations are feasible from a technical perspective. These will be assessed comparatively and the preferred alternative from a technical and environmental perspective will be recommended.</p> <p><u>The alternative locations are:</u></p> <ul style="list-style-type: none"> • Alternative 1 (Preferred): Back-to-back facility substation and switching station located in the south of the site. • Alternative 2: Back-to-back facility substation and switching station located in the north of the site.
<p>BESS Location Alternatives</p>	<p>Within the proposed development footprint the Applicant has identified three (3) potential locations for the placement of the BESS. All three locations are feasible from a technical perspective.</p> <p>These will be assessed comparatively and the preferred alternative from a technical and environmental perspective will be recommended.</p> <p><u>The alternative locations are:</u></p> <ul style="list-style-type: none"> • Alternative 1 (preferred): Located centrally next to the facility substation in the south of the site. • Alternative 2: Located centrally next to the facility substation in the north of the site.

	<ul style="list-style-type: none"> Alternative 3: Placed or spread out within the PV area (referred to as BESS Local).
'Do-nothing Alternative	<p>The option to not construct the Mirach Solar PV Project. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within the development area and footprint as well as the surrounding areas of the site. The opportunities associated with the development of the solar facility for the Thabazimbi area will however not be made available.</p>

The sections below provide more detail on the alternatives under consideration.

2.4.1 Site-Specific and Layout Alternatives

As indicated in section 2.3 a site selection process was undertaken by the Applicant for the identification of the development area, followed by the design of the development footprint within the development area. The development area is large in extent (747 ha) and therefore represents an opportunity to consider and avoid the sensitive environmental areas and features through the careful planning and placement of the development footprint which is of a smaller extent (650 ha).

The process to ultimately identify the preferred development footprint/layout alternative has been as follows:

1. The entire extent of the development area (752 ha) was fully assessed as part of the Scoping Phase and within the draft Scoping Report completed by Environamics Environmental Consultants.
2. The Applicant and EAP (Blue Crane Environmental) have considered all final and confirmed environmental sensitivities for the site and through the use of spatial mapping considered the areas that need to be avoided and are not available for the placement of infrastructure. This guidance was utilised by the Applicant for the design and placement of infrastructure as part of the development footprint put forward for assessment as part of this draft EIA Report.
3. The Applicant has provided to the EAP (Blue Crane Environmental) a draft facility layout which has considered and assessed by the EAP and the independent specialists in this

draft EIA Report. The layout is made available to I&APs as part of the 30-day review and comment period of this draft EIA Report.

4. Should any further concerns be raised by the specialists or I&APs (including the competent and commenting authorities) regarding the layout (including potential infringement into sensitive environmental features / area) the Applicant will undertake an optimisation process to optimise the draft layout to ensure suitability.
5. The optimised layout will therefore then be put forward for authorisation and a motivation for the layout from a technical and environmental perspective will be provided by the EAP (Blue Crane Environmental). Therefore, no alternative development footprints are under assessment, the optimised layout will be considered as preferred where small tweaks are relevant to ensure environmental suitability.

Therefore, the draft facility layout provided as part of the EIA Phase provides an indication of the 650 ha development footprint and the preliminary location for the associated infrastructure prior to optimisation, should optimisation for further avoidance be relevant. Figure 2.4 provides an indication of the layout that was under assessment as part of the Scoping Phase and considered in the Scoping Report, which received approval from DFFE. Figure 2.5 provides an indication of the detailed draft facility layout under assessment as part of the EIA Phase and considered within this draft EIA Report.

Note: It is customary to develop the final/detailed construction layout of the solar PV facility only once an Independent Power Producer (IPP) is awarded a successful bid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) or an alternative programme, after which major contracts are negotiated and final equipment suppliers identified. For the purpose of the Environmental Impact Assessment (EIA), site layout alternatives will not be comparatively assessed, but rather a single layout will be refined as additional information becomes available throughout the EIA process (e.g., specialist input, additional site surveys, ongoing stakeholder engagement).

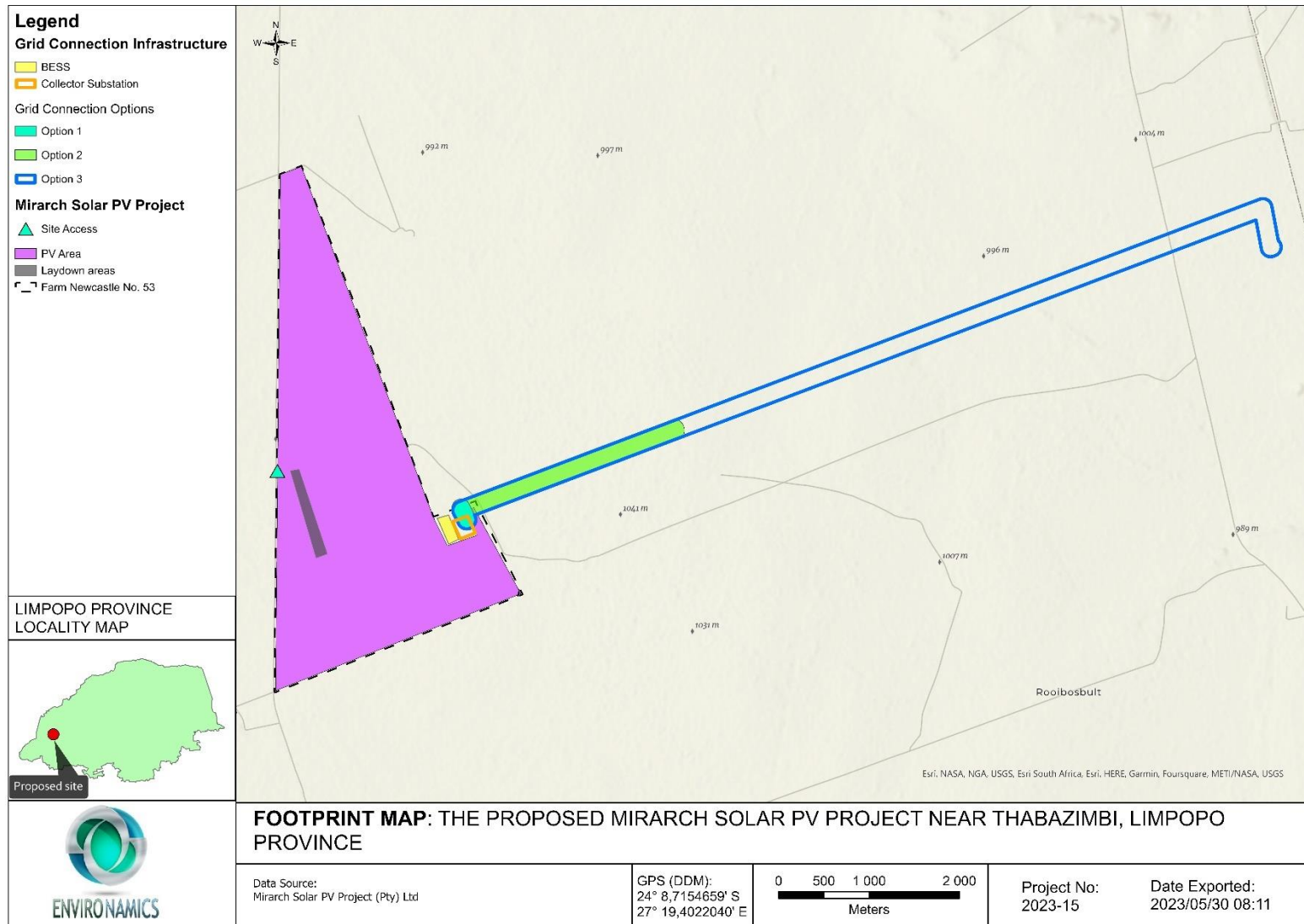


Figure 2.4: Mirach Solar PV Project layout assessed as part of the Scoping Phase (Source: Environamics Environmental Consultants, June 2023)

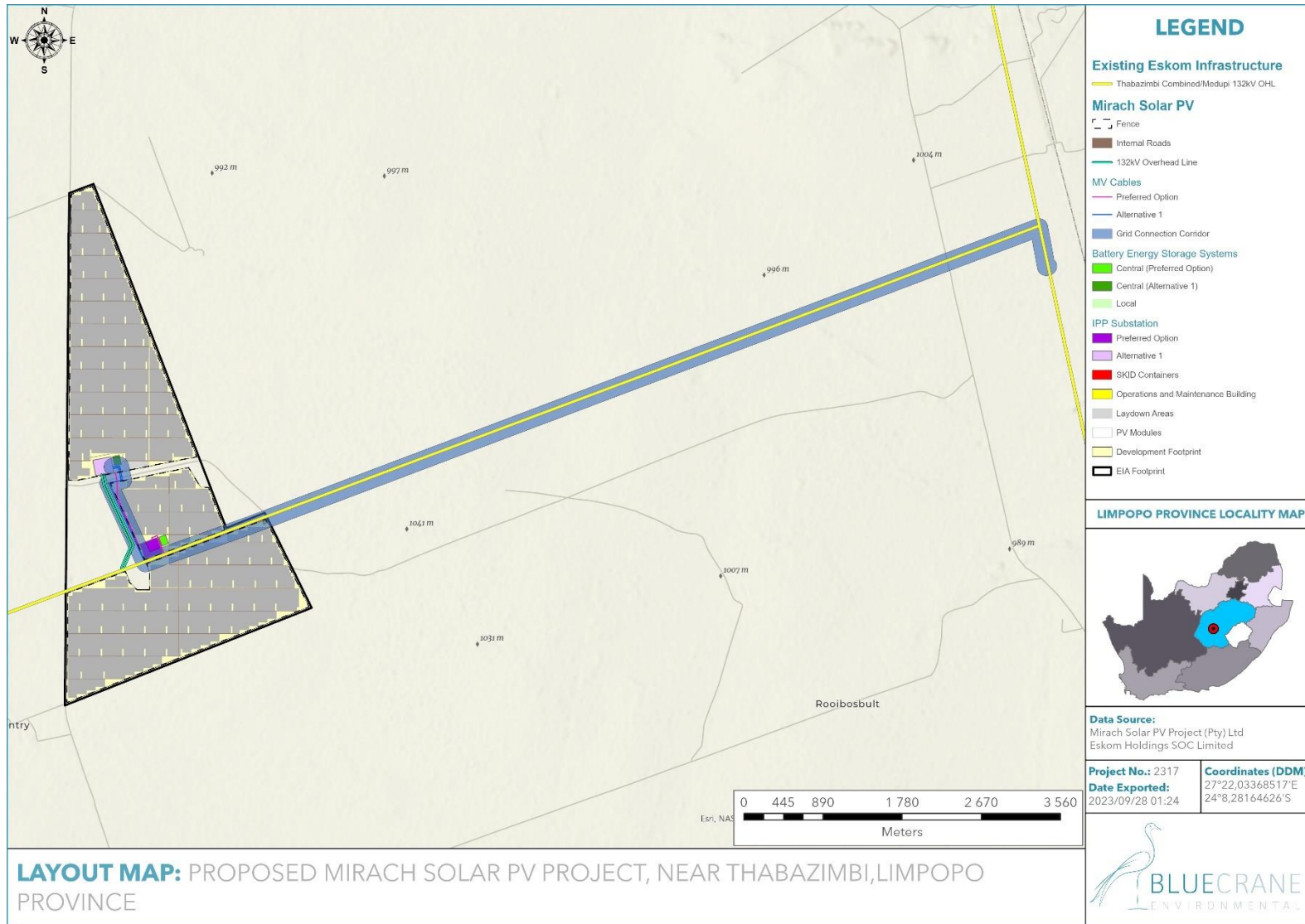


Figure 2.5: Mirach Solar PV Project draft development footprint assessed as part of the EIA Phase providing detail of the infrastructure proposed

2.4.2 Activity Alternatives

The activity alternative considers whether the development of a solar PV facility would be the most appropriate use of the land in terms of energy generation.

When considering Mirach Solar PV Project (Pty) Ltd, the company is by trade a renewable energy project development company and as such will only consider the development of renewable energy activities. Considering the available natural energy resources within the area and the lack of other natural resources such as water in terms of use for development and operation, it is considered that solar energy developments are preferred within the identified site.

Considering the location of the site / development area and the fact that there are currently no other proposed solar facilities within the surrounding area (considering the existing DFFE database), the potential for cumulative impacts associated with the development of solar facilities is expected to occur on a very limited scale. The cumulative impacts can be mitigated against resulting to a very low / negligible negative significance on the surrounding environment. The development of the Mirach Solar PV Project in itself is considered a positive addition with regards to implementing this technology in the identified location (i.e., site). Furthermore, the grid connection infrastructure to connect the solar PV facility to the national grid is present within the vicinity of the site (i.e. no further than 10km).

In terms of alternative renewable energy generation options available such as wind energy and the use of Concentrated Solar Power (CSP) technology has been considered.

Due to the local climatic conditions a wind energy facility is not considered suitable as the area does not have the required wind resource. Furthermore, the applicant has opted for the generation of electricity via solar power rather than the use of wind turbines based on the renewable energy resource available for the area, which is predominantly a solar resource. This alternative is therefore regarded as not feasible and will not be evaluated further in this report.

CSP technology requires large volumes of water, and this is a major constraint for this type of technology considering the water challenges and limitations experienced in the country as a whole. While the irradiation values are high enough to generate sufficient solar power the water constraints render this alternative not feasible. It must also be noted that the Integrated Resources Plan no longer includes the use of CSP as part of the energy mix of the country.

Based on the above, this alternative is not considered feasible or reasonable and will not be considered further in this report.

2.4.3 Technology Alternatives

As Mirach Solar PV Project (Pty) Ltd is an Independent Power Producer, only renewable energy technologies are being considered for the generation of up to 340 MW of electricity. Considering the local resources available (i.e., wind and solar irradiation) for such technologies, the footprint requirements for such developments and the current land use of the site (i.e., agriculture and mining), the site is considered most suitable for the establishment of a solar facility. This has been confirmed through the global horizontal solar irradiation for the area and other technical characteristics available within the surrounding areas of the site.

For the development of the Mirach Solar PV Project, technology alternatives were considered in terms of the PV panels that may be installed as well as the type of Battery Energy Storage System (BESS) and power line. These are discussed in the sections below.

Photovoltaic Panels

Several types of semiconductor technologies/ monofacial panels are available, however two are the most widely adopted, namely crystalline silicon and thin film.

- Crystalline silicon panels – are constructed by first putting a single slice of silicon through a series of processing steps, creating one solar cell. These cells are then assembled together in multiples to make a solar panel. Crystalline silicon, also called wafer silicon, is the oldest and the most widely used material in commercial solar panels. Two main types of crystalline silicon panels available are Mono-crystalline Silicon and Poly-crystalline Silicon.
- Thin film panels - Thin film solar panels are made by placing thin layers of semiconductor material onto various surfaces, usually on glass. The term thin film refers to the amount of semiconductor material used. It is applied in a thin film to a surface structure, such as a sheet of glass. There are three main types of thin film used, namely, Cadmium Telluride, Amorphous Silicon and Copper, Indium, Gallium, Selenide (CIGS).

Further to the above, bifacial PV panels are also under consideration for the Mirach Solar PV Project. Traditional solar panels use an opaque back sheet. By comparison, bifacial solar panels either have a clear/reflective back sheet or have dual panes of glass. Most of these

solar panels are frameless so any issues with potential-induced degradation (PID) are reduced. To efficiently convert light into electricity from both sides, bifacial solar cells have selective-area metallization schemes that enable light to pass between the metallized areas, rather than the conventional thick metal collectors as seen with monofacial solar panels.

In terms of the preference of the PV panels for the Mirach Solar PV Project the Applicant has indicated that Monofacial or Bifacial PV panels will be utilised. The panels will either be fixed to a single-axis and/or double horizontal tracking structure where the orientation of the panel varies according to the time of the day, as the sun moves from east to west or tilted at a fixed angle equivalent to the latitude at which the site is located in order to capture the most sun.

PV panels with single axis tracking are preferred over fixed-axis or double axis tracking systems due to the potential to achieve higher annual energy yields whilst minimising the balance of system (BOS) costs, resulting in the lowest levelized cost of energy (LCOE). The development of the PV facility will take into consideration during the final design phase the use of either tracker vs fixed-tilt mounting structures. Both options are considered feasible for the site.

Battery Energy Storage System (BESS)

A BESS is a type of energy storage power station that uses a group of batteries to store electrical energy. Conventionally these battery containers would stand in a dedicated area next to each other however, an alternative location is placing the single BESS container located next to the inverters in between the panel arrays.

Two BESS technology alternatives are under consideration for Mirach Solar PV Project. These include:

- Solid State Battery Electrolytes - Solid state battery electrolytes, such as lithium-ion (Li-ion), zinc hybrid cathode, sodium ion, flow (e.g., zinc iron or zinc bromine), sodium sulphur (NaS), zinc air and lead acid batteries, can be used for grid applications. Compared to other battery options, Li-ion batteries are highly efficient, have a high energy density and are lightweight. As a result of the declining costs, Li-ion technology now accounts for more than 90% of battery storage additions globally (IRENA, 2019).
- Redox-flow Technology - Flow batteries use solid electrodes and liquid electrolytes. The most used flow battery is the Vanadium Redox Flow Battery (VRFB), which is a

type of rechargeable flow battery that employs vanadium ions in different oxidative states to store chemical potential energy.

Considering the nature of the project, only solid-state battery technology would be envisaged for implementation.

Mirach Solar PV Project (Pty) Ltd is most likely to locate the BESS in a single dedicated area standing next to each other should this be deemed feasible from an engineering perspective. Another option is to spread out the BESS infrastructure and locate it adjacent to the inverters within the PV panel array.

Power Line Pylon Structures

The specific pylon structures to be used for the overhead power lines will only be confirmed during the financial close phase of the project. The most appropriate structures from a design and environmental perspective will be considered during the design phase of the project.

2.4.4 Grid Connection Alternatives

The Applicant has identified the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line which traverses the Mirach Solar PV Project site / development area as a feasible grid connection point into the national grid.

As such, the Applicant proposes the construction of a 132 kV overhead power line via a Loop-In-Loop-Out (LILO) connection between the Eskom collector switching station and the existing Thabazimbi Combined / Waterberg 1 132 kV overhead power line. The power line will be either a single or double circuit.

A 200 m wide LILO grid connection corridor with a length of 13 km is under assessment for the placement of the overhead power line to evacuate the generated electricity to the national grid. Refer to Figure 2.6 below.

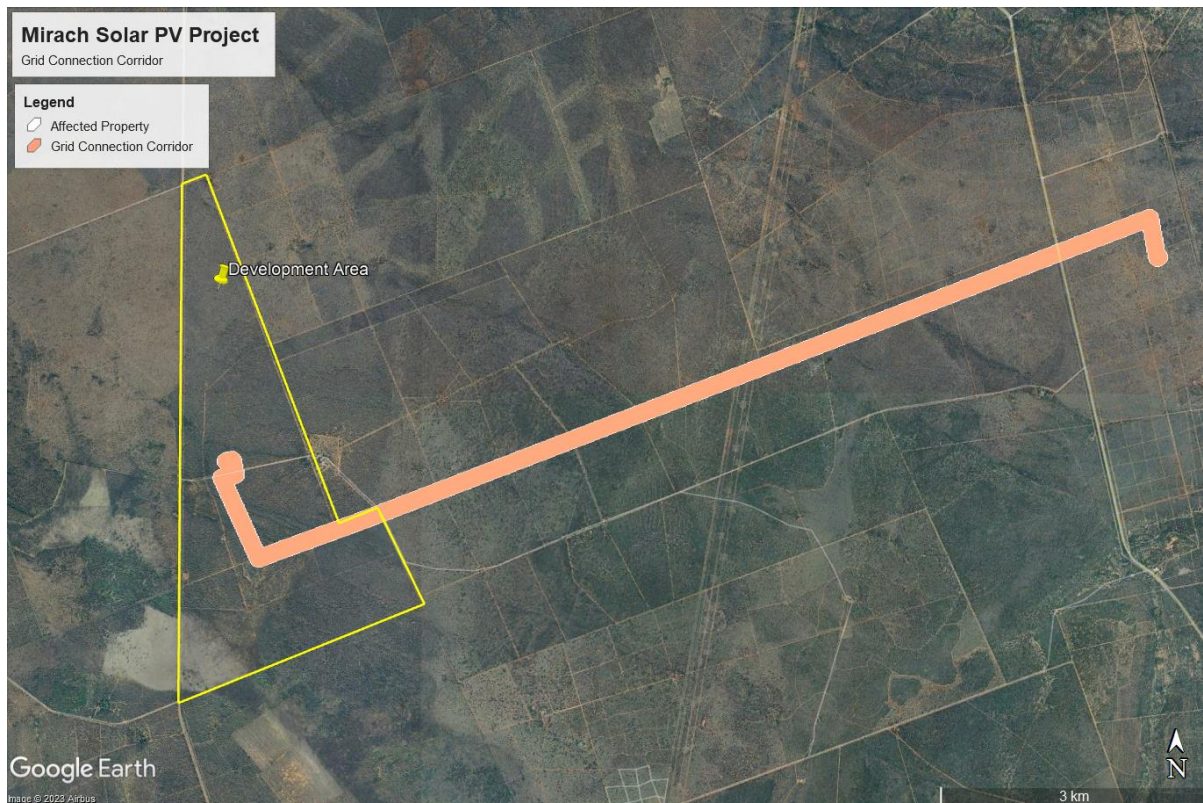


Figure 2.6: Mirach Solar PV Project LILO Connection Corridor under assessment for the placement of the overhead power line

2.4.5 Substation Location Alternatives

Within the draft development footprint two locations are proposed for assessment for the placement of the on-site facility substation (and associated switching station). Refer to Figure 2.7 below.

The locations of the alternatives are as follows:

- Alternative 1 (Preferred): Back-to-back facility substation and switching station located in the south of the site.
- Alternative 2: Back-to-back facility substation and switching station located in the north of the site.

These alternatives will be assessed comparatively in Section 10 to indicate the preferred alternative from an environmental perspective.

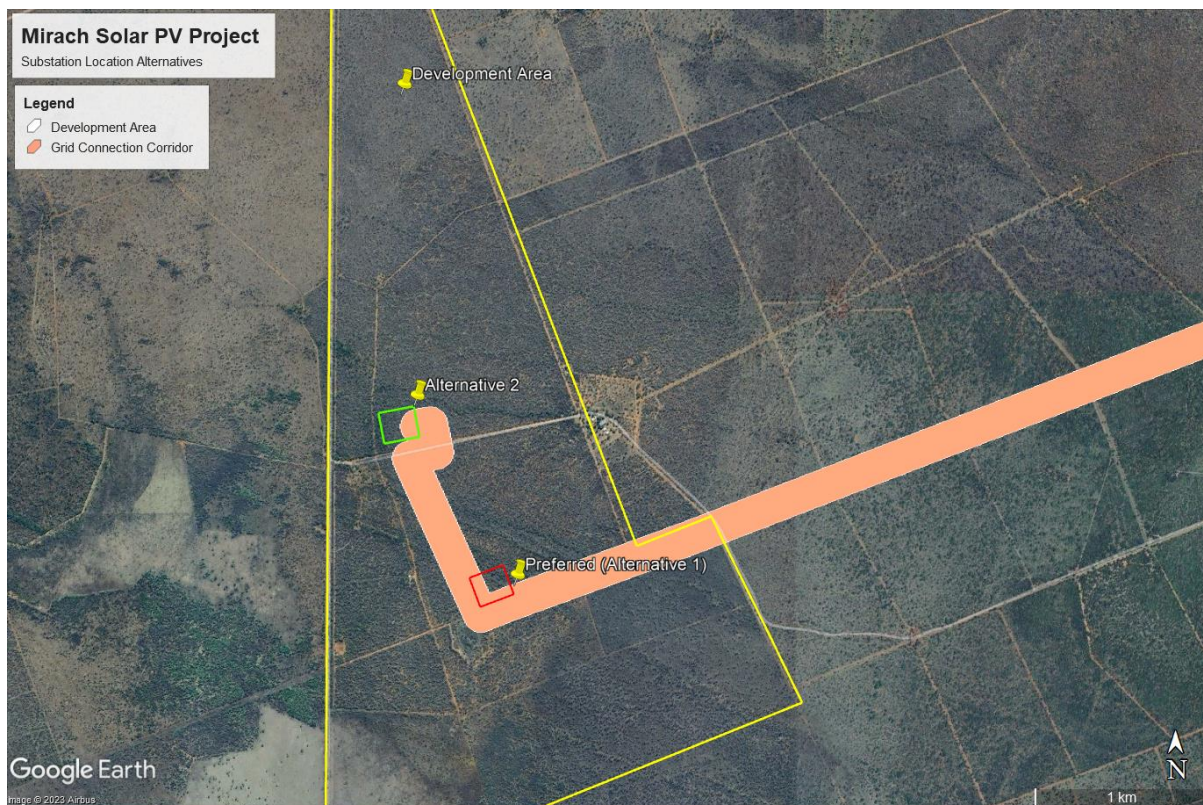


Figure 2.7: Mirach Solar PV Project on-site facility substation location alternatives

2.4.6 BESS Location Alternatives

Within the draft development footprint three location options are proposed for assessment for the placement of the Battery Energy Storage System. Two of these are central locations within the development footprint where two large specified areas are indicated. The other option is the placement and distribution of the BESS infrastructure throughout the PV array and adjacent to the inverters (referred to as BESS Local). Refer to Figure 2.8.

These alternative BESS locations are:

- Alternative 1 (preferred): Located centrally next to the facility substation in the south of the site.
- Alternative 2: Located centrally next to the facility substation in the north of the site.
- Alternative 3: Placed or spread out within the PV area (referred to as BESS Local).



Figure 2.8: Mirach Solar PV Project BESS location alternatives

These alternatives will be assessed comparatively in Section 10 to indicate the preferred alternative from an environmental perspective.

2.4.7 'Do-nothing' Alternative

This alternative considers the option of 'do nothing' and maintaining the status quo of the affected environment. The description provided in section 7 of this report could be considered the baseline conditions (*status quo*) to persist should the no-go / 'do nothing' alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged (with no negative or positive impacts to occur) and will continue to be used for the current land uses present. The area associated with the development is characterized with soils with a poor cropping potential. There is segregation of crop fields or land with a high land potential and capability identified within the development footprint.

The potential opportunity costs in terms of alternative land use income through rental for the energy facility and the supporting social and economic development in the area would be lost if the *status quo* persists.

Further to the above, the ‘do-nothing’ alternative is not a preferred alternative, because if the solar facility is not developed the following positive impacts will also not be realised:

- Job creation from the construction and operation phases.
- Economic benefit to participating landowners due to the revenue that will be gained from leasing the land to the developer.
- Potential relief (albeit to a limited extent) for a stressed area.
- Meeting of future demand for additional energy generation in a most economic and rapid manner.
- Provision of clean, renewable energy in an area where the renewable energy resource is optimally available.

2.5 Project Development Phases and Services Required

This section provides an indication of the activities to be undertaken within the different development phases of the project as well as the services that will be required. Refer to Table 2.5.

Table 2.5: Summary of the Activities to be undertaken in the development phases

Design and Pre-Construction Phase	<ul style="list-style-type: none"> • Post-authorisation factors influence the final design of the facility and therefore small-scale modifications of the PV array or associated infrastructure are expected. • The EPC Contractor, responsible for the overall construction of the project, will comply with the approved facility design as far as possible. However, the construction process is dynamic and unforeseen changes to the project specifications may take place. • Prior to construction commencement, surveys will be required including, but not limited to confirmation of the micro-siting footprint (i.e., the precise location of the PV panels, substation and the plant’s associated infrastructure) and a geotechnical survey. • Geotechnical surveys are executed by geotechnical engineers and geologists with the purpose to design earthworks and foundations for structures and to execute earthwork repairs necessitated due to changes in the subsurface environment. • Biodiversity walk-throughs are undertaken for the identification and permitting of protected flora species.
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<p>Construction Phase</p>	<ul style="list-style-type: none"> • The majority of the labour force is expected to be sourced from the surrounding towns, where possible, and no labour will be accommodated on-site during the construction period. This is however dependent on the availability of the required skills in the area. • At the peak of construction, the proposed project is likely to create a maximum of 500 employment opportunities. These employment opportunities will be temporary, and will last for a period of approximately 18 -24 months (i.e., the length of construction). • Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities. • Employment opportunities for the proposed PV facility will peak during the construction phase and significantly decline during the operation phase. • Access to the site will be established for the construction of the facility. Within the facility development footprint itself, access will be required from new / existing roads for construction purposes (and limited access for maintenance during operation). • Site preparation activities will include clearance of vegetation. These activities will require the stripping of topsoil which will need to be stockpiled, backfilled and / or spread on site. • The national, regional, secondary and proposed internal access roads will be used to transport all components and equipment required during the construction phase of the PV facility. Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the National Road Traffic Act (No. 93 of 1996) (NRTA)⁴ by virtue of the dimensional limitations. • Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported to site, a dedicated equipment construction camp and laydown
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⁴ A permit will be required in accordance with Section 81 of the NRTA which pertains to vehicles and loads which may be exempted from provisions of the Act.

	<p>area will need to be established adjacent to the workshop area. The laydown area will be used for the assembly of the PV panels and the general placement / storage of construction equipment.</p> <ul style="list-style-type: none"> • Installation of the PV solar panels and structural and electrical infrastructure will be undertaken that is required for the operation of the facility. • For array installations, vertical support posts are driven into the ground. Depending on the results of the geotechnical report, a different foundation method, such as screw pile, helical pile, micropile or drilled post / pile could be used. The posts will hold the support structures (tables) on which the PV modules would be mounted. Brackets attach the PV modules to the tables. • The Battery Energy Storage System will be installed as per the factory instructions. The BESS will be assembled off site and delivered to site for installation. • The establishment of the auxiliary infrastructure (including the substation and switching station) and support buildings will require the clearing of vegetation and levelling of the development site, and the excavation of foundations prior to construction. Laydown areas for building materials and equipment associated with these buildings will also be required. • A power line is constructed by surveying the power line route / corridor, constructing foundations for the towers, installing the towers, stringing the conductors, and finally rehabilitating disturbed areas and protecting erosion sensitive areas. • Once construction is completed and all construction equipment has been removed, the site will be rehabilitated where practical and reasonable. In addition, on full commissioning of the PV facility, any access points which are not required during operation must be closed and rehabilitated accordingly.
<p>Operation Phase</p>	<ul style="list-style-type: none"> • The facility is expected to operate for a minimum of 20 – 25 years. • The facility will operate continuously, 7 days a week, during daylight hours. • Operation phase is likely to create a maximum of 25 permanent employment opportunities.

	<ul style="list-style-type: none"> • While the PV facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Maintenance (O&M) plan include monitoring and reporting the performance of the PV facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.
Decommissioning Phase	<ul style="list-style-type: none"> • The economic viability of the PV facility following the initial 25-year operational lifespan, will determine if the facility will be decommissioned or the operation phase will be extended. • If it is deemed financially viable to extend the operation phase, existing components would either continue to operate, or be disassembled and replaced with new, more efficient technology / infrastructure available at the time. This replacement will be within the ambit of the Environmental Authorisation. • Site preparation activities include confirming the integrity of the access to the site to accommodate the required decommissioning equipment. • The equipment to be removed will depend on the land use proposed for the site at the time. • All above ground facilities that are not intended for future use at the site will be removed. Much of the above ground wire, steel, and PV panels of which the system is comprised, are recyclable materials and would be recycled to the extent feasible. • The site will be rehabilitated and can be returned to agriculture or another beneficial land-use, to be determined through consultation with the affected landowner.

Specific services will be required during all phases of the development. This includes water provision, stormwater management, sanitation, waste management and electricity. These are discussed in the sections below.

1. Water Provision

Adequate provision of water will be a prerequisite for the development, during both the construction and operation phases. Four (04) options will be considered, in order of priority by the Developer:

- a. Water will be supplied from the Local Municipality (LM). The Applicant will approach the LM to enquire whether they can provide all or part of the total water requirements of the Project. Specific arrangements will be agreed with the LM in a Service Level Agreement (SLA), following the appointment of preferred bidder status during the financial close period.
- b. Water supply from a Private Contractor, which may include extraction from any bulk water supply lines nearby to the site.
- c. An existing borehole on site, subject to the National Water Act (NWA) requirements.
- d. A new borehole on site, subject to NWA requirements.

The estimated amount of water required during construction is 65 000 m³. The estimated maximum amount of water required during the operational phase is 30 000 m³ per annum. These values will be confirmed at a later stage of the project.

2. Stormwater Management

To avoid soil erosion, it is recommended that the clearing of vegetation be limited. Stormwater management and mitigation measures are included in the Environmental Management Programme (EMPr) submitted as part of this draft EIA Report. Refer to Appendix G.

3. Sanitation

Chemical toilets will be utilised during the construction phase and removed / emptied by an appointed contractor for treatment at a licensed facility off site.

No effluent will be produced during operation of the facility, except for normal sewage from site and operations staff. This will be collected and treated as per normal standards using a septic. In cases where the Local Municipality does not permit the use of septic tanks, sewage will be stored in conservancy tanks and collected (honey-sucker) by a service provider, either the Local Municipality or a Private Contractor, and treated at an approved facility off site.

4. Waste Management

During the construction phase, solid waste will mainly be in the form of construction material, hazardous waste (i.e., fuel, grease, etc.), excavated substrate and domestic solid waste. All waste will be disposed of in scavenger proof bins and temporarily placed in a central location for removal by an appointed contractor and disposed into a registered landfill site. Where possible the re-use and recycling of waste material will be encouraged. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility. The Applicant will request confirmation from the municipality that they have sufficient capacity at the registered landfills for the solid waste.

During the operation phase household waste will be removed to a licensed landfill site by a private contractor or by the local municipality particularly where re-use and recycling is not practical.

5. Electricity Provision

Electricity supply during construction will be provided by either on-site diesel generators or arranged with the Local Municipality or Eskom Distribution, via an existing or new 11 kV power line.

During operation, the electricity will be supplied by the PV facility/ via the main grid connection or via the installed construction supply. Efficient electricity appliances will be used as far as possible on site. Where possible, borehole pumps will be powered by solar energy.

2.6 Changes in the project details from Scoping Phase to EIA Phase

The EIA Regulations, 2014, (as amended) requires an indication of any deviation from the approved scoping report.

This section provides feedback in this regard. Refer to the points below:

- During the Scoping Phase the Applicant had indicated that the generation capacity of the Mirach Solar PV Project will be 300 MW. Following the design of the draft development footprint and the modelling thereof the Applicant has indicated that the proposed development footprint within the approved development area would be able to generate 340 MW and not 300 MW. This increase in the generation capacity is not considered to be problematic as the entire extent of the development area was assessed. An amended Application for Environmental Authorisation has been submitted to the DFFE with the draft EIA Report to reflect this change. The listed

activities in both this draft EIA Report and the amended Application have been updated accordingly.

- During the Scoping Phase three separate grid connection corridors were proposed to indicate the relevant grid connection points along the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line. However, as the routes overlap and follow the same alignment the Applicant has advised that one grid connection corridor is to be assessed and authorised. This is considered to be the most technically feasible approach in assessing and authorising the grid connection corridor. Therefore, no new routes are proposed, the only change is how the corridor /grid connection points have been packaged within the draft EIA Report.

2.7 Legal Requirements Complied with in Section 2 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(b) the location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including: (i) the 21-digit Survey General code of each cadastral land parcel; (ii) where available, the physical address and farm name, (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	<p>The details of the location of the Mirach Solar PV Project proposed development footprint is included in section 2.1. This includes the 21-digit Survey General code of each cadastral land parcel.</p> <p>The coordinates of the development footprint are included in section 2.2.</p>
3(1)(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land	The draft development footprint / facility layout plan proposed for Mirach Solar PV Project is included in section 2.2 as Figure 2.1.

<p>where the property has not been defined, the coordinates within which the activity is to be undertaken.</p>	
<p>3(1)(d) a description of the scope of the proposed activity, including (ii) a description of the associated structures and infrastructure related to the development.</p>	<p>A description of the infrastructure associated with the development footprint is included as section 2.2 and is illustrated in Figure 2.1.</p>
<p>3(1)(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report; including: (i) details of the development footprint alternatives considered.</p>	<p>A description of the process which has been followed in identifying the proposed development footprint within the approved development area (following the Scoping Phase) is included in section 2.3.</p> <p>The details of the site-specific and layout alternatives (i.e. development footprint alternatives) is included as sections 2.4.1-2.4.7.</p>
<p>3(1)(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report; including: (ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such.</p>	<p>Section 2.4 provides an indication of the alternatives associated with the development footprint, including a motivation where no alternatives are assessed.</p> <p>Also refer to section 2.3.</p>
<p>3(1)(u) an indication of any deviation from the approved scoping report, including the plan of study, including (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation.</p>	<p>An indication of deviations from the approved scoping report is included in section 2.6. The deviations are not significant and do not relate to the methodology in determining the impact assessment but rather small changes in the project description.</p>

3 POLICY AND LEGISLATIVE CONTEXT

This section provides an overview of the policy and legislative context considering the nature of the proposed development and the area within which the Mirach Solar PV Project is proposed. The section further identifies the relevant legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that may be relevant to the Mirach Solar PV Project.

3.1 National, Provincial and Local Policy and Planning Context

Environmental decision making with regards to solar facilities is based on numerous policy and legislative documents on national, provincial and local level. These documents inform decisions on project level environmental authorisations issued by the National Department of Forestry, Fisheries and the Environment (DFFE) as well as comments from local and district authorities. Moreover, it is significant to note that they also inform strategic decision making reflected in the IDPs and SDFs.

The following acts and policies and their applicability to the proposed development are briefly summarised:

National Level:

- The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996).
- National Environmental Management Act, 1998 (Act No. 107 of 1998) [NEMA].
- The National Energy Act, 2008 (Act 34 of 2008).
- Electricity Regulation Act (Act No. 4 of 2006) (as amended).
- National Water Act, 1998 (Act No. 36 of 1998).
- National Environmental Management: Biodiversity Act (10 of 2004) (NEMBA).
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008).
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004).
- The National Heritage Resources Act, 1999 (Act No. 25 of 1999).
- Conservation of Agricultural Resources Act, 1983 (Act No. 85 of 1983).
- Subdivision of Agricultural Land Act (70 of 1970) (SALA).
- Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013). (SPLUMA).
- The National Forests Act, 1998 (Act 84 of 1998).

- The National Road Traffic Act (93 of 1996) (NRTA).
- The White Paper on the Energy Policy of the Republic of South Africa (1998).
- The White Paper on Renewable Energy (2003).
- Integrated Resource Plan (IRP) for South Africa (2010-2030).
- National Development Plan of 2030.
- National Infrastructure Plan of South Africa (2012).
- New Growth Path Framework (2010).
- Climate Change Bill (2018).
- Climate Change Bill (2021) – for public comment.
- Strategic Integrated Projects (SIPs) (2010 – 2030).
- Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014).

Provincial Level:

- Limpopo Development Plan (LDP) 2020 – 2025
- Limpopo Provincial Spatial Development Framework (PSDF) (2022)

District Level:

- Waterberg DM Final Integrated Development Plan (IDP) 2020 – 2021 (2020)
- Waterberg District Spatial Development Framework (SDF) (2021)

Local Level:

- Thabazimbi Local Municipal Draft Integrated Development Plan (IDP) Review 2020 – 2021 (2021)
- Thabazimbi Local Municipality Spatial Development Framework (SDF) (2018)

The key principles and objectives of each of the legislative and policy documents are briefly summarised in Tables 3.1 and 3.2 to provide a reference framework for the implications for the proposed solar developments.

3.2 International Policy and Planning Context

Further to the above the policy and planning context on an international level is briefly considered.

1. United Nations Framework Convention on Climate Change (UNFCCC) and Conference of the Party (COP)

Climate change is one of the major global challenges of the 21st century that require global response. The adverse impacts of climate change include persistent drought and extreme weather events, rising sea levels, coastal erosion and ocean acidification, further threatening food security, water, energy and health, and more broadly efforts to eradicate poverty and achieve sustainable development. Combating climate change would require substantial and sustained reductions in GHG emissions, which together with adaptation, can limit climate change risks. The convention responsible for dealing with climate change is the United Nations Framework Convention on Climate Change (UNFCCC).

The UNFCCC was adopted in 1992 and entered into force in 1994. It provides the overall global policy framework for addressing the climate change issue and marks the first international political response to climate change. The UNFCCC sets out a framework for action aimed at stabilising atmospheric concentrations of GHGs to avoid dangerous anthropogenic interference with the climate system.

The UNFCCC has established a variety of arrangements to govern, coordinate and provide for oversight of the arrangements described in the documentation. The oversight bodies take decisions, provide regular guidance, and keep the arrangements under regular review in order to enhance and ensure their effectiveness and efficiency. The Conference of Parties (COP), established by Article 7 of the Convention, is the supreme body and highest decision-making organ of the Convention. It reviews the implementation of the Convention and any related legal instruments, and takes decisions to promote the effective implementation of the Convention.

At the Sharm el-Sheikh Climate Change Conference (COP27), countries came together to take action towards achieving the world's collective climate goals as agreed under the Paris Agreement and the Convention. The conference took place from 6-20 November 2022 in Sharm el-Sheikh, Egypt.

Five key takeaways from the conference have been identified which will shape the priorities from climate action in 2023 and beyond. These are indicated below:

1. *Establishing a dedicated fund for loss and damage* – An agreement was made to provide loss and damage funding for vulnerable countries hit hard by floods, droughts and other climate disasters. This is in order to enable countries to have financial

capacity to respond to loss and damage associated with catastrophic effects of climate change.

2. *Maintaining a clear intention to keep 1.5°C within reach* – The UN’s Intergovernmental Panel on Climate Change indicates that limiting warming to around 1.5°C requires global greenhouse gas emissions to peak before 2025 at the latest, and be reduced by 43% by 2023. However, current projections show that the world is off course to keep 1.5°C in reach.
3. *Holding businesses and institutions to account* – There is new focus on accountability when it comes to the commitments made by sectors, businesses and institutions.
4. *Mobilizing more financial support for developing countries* – Finance is key to combat climate change. Mitigation, adaptation, loss and damage and climate technology requires sufficient funds to function properly and yield the desired results. COP27 created a pathway to align the broader finance flows towards low emissions and climate resilient development.
5. *Making the pivot toward implementation* – COP27 was expected to focus on implementation for “every corner of human activity”.

2. The Equator Principles IV (July, 2020)

The Equator Principles (EPs) IV constitute a financial industry benchmark used for determining, assessing, and managing a project’s environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. In addition, these principles are used to ensure that projects financed by the Equator Principles Financial Institutions (EPFI) are developed in a manner that is socially responsible and reflects sound environmental management practices. The EPs are applicable to infrastructure projects (such as the proposed project) and apply globally to all industry sectors.

The EPs comprise the following principles:

Principle 1: Review and Categorisation

Principle 2: Environmental and Social Assessment.

Principle 3: Applicable Environmental and Social Standards.

Principle 4: Environmental and Social Management System and Equator Principles Action Plan

Principle 5: Stakeholder Engagement

Principle 6: Grievance Mechanism

Principle 7: Independent Review

Principle 8: Covenants

Principle 9: Independent Monitoring and Reporting

Principle 10: Reporting and Transparency

When a project is proposed for financing, the Equator Principle Financial Institution (EPFI) will categorise it based on the magnitude of its potential environmental and social risks and impacts.

Projects can be categorized as follows:

- **Category A:** Projects with potential significant adverse environmental and social risks and / or impacts that are diverse, irreversible or unprecedented.
- **Category B:** Projects with potential limited adverse environmental and social risks and / or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.
- **Category C:** Projects with minimal or no adverse environmental and social risks and / or impacts.

Based on the above-mentioned criteria, the Mirach Solar PV Project can be anticipated to be categorised as a Category B project.

Category A and Category B projects require that an assessment process be conducted to address the relevant environmental and social impacts and risks associated with the project. Such an assessment may include the following where applicable:

- An assessment of the baseline environmental and social conditions.
- Consideration of feasible environmentally and socially preferable alternatives.
- Requirements under host country laws and regulations, applicable international treaties and agreements.
- Protection and conservation of biodiversity (including endangered species and sensitive ecosystems in modified, natural and Critical Habitats) and identification of legally protected areas.

- Sustainable management and use of renewable natural resources (including sustainable resource management through appropriate independent certification systems).
- Use and management of dangerous substances.
- Major hazards assessment and management.
- Efficient production, delivery and use of energy.
- Pollution prevention and waste minimisation, pollution controls (liquid effluents and air emissions), and solid and chemical waste management.
- Viability of project operations in view of reasonably foreseeable changing weather patterns / climatic conditions, together with adaptation opportunities.
- Cumulative impacts of existing projects, the proposed project, and anticipated future projects.
- Respect for human rights by acting with due diligence to prevent, mitigate and manage adverse human rights impacts.
- Labour issues (including the four core labour standards), and occupational health and safety.
- Consultation and participation of affected parties in the design, review and implementation of the project.
- Socio-economic impacts.
- Impacts on affected communities, and disadvantaged or vulnerable groups.
- Gender and disproportionate gender impacts.
- Land acquisition and involuntary resettlement.
- Impacts on indigenous peoples, and their unique cultural systems and values.
- Protection of cultural property and heritage.
- Protection of community health, safety and security (including risks, impacts and management of Project's use of security personnel).
- Fire prevention and life safety.

Such an assessment should propose measures to minimise, mitigate, and offset adverse impacts in a manner relevant and appropriate to the nature and scale of the Project. In terms of the EPs, South Africa is a non-designated country (as at 4 March 2020), and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines.

Mirach Solar PV Project is under assessment in accordance with the requirements of the 2014 EIA Regulations, as amended (GNR 326), published in terms of Section 24(5) of NEMA, which is South Africa's national legislation providing for the authorisation of certain listed activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.

3. IFC's Performance Standards on Environmental and Social Sustainability (January 2012)

The IFC's Performance Standards on Environmental and Social Sustainability were developed by the IFC and were last updated on 1 January 2012. The overall objectives of the IFC Performance Standards are:

- To fight poverty;
- To do no harm to people or the environment;
- To fight climate change by promoting low carbon development;
- To respect human rights;
- To Promote gender equity;
- To provide information prior to project development, free of charge and free of external manipulation;
- To collaborate with the project developer to achieve the PS;
- To provide advisory services; and
- To notify countries of any Trans boundary impacts as a result of a project.

The Performance Standards comprise the following:

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts.

Performance Standard 2: Labour and Working Conditions.

Performance Standard 3: Resource Efficiency and Pollution Prevention.

Performance Standard 4: Community Health, Safety and Security.

Performance Standard 5: Land Acquisition and Involuntary Resettlement.

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.

Performance Standard 7: Indigenous Peoples.

Performance Standard 8: Cultural Heritage.

Performance Standard 1 establishes the importance of:

- i) Integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects.
- ii) Effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them.
- iii) The management of social and environmental performance throughout the life of a project through an effective Environmental and Social Management System (ESMS).

Performance Standard 1 requires that a process of environmental and social assessment be conducted, and an ESMS appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts be established and maintained. Performance Standard 1 is the overarching standard to which all the other standards relate. Performance Standard 2 through 8 establish specific requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. While all relevant social and environmental risks and potential impacts should be considered as part of the assessment, Performance Standard 2 through 8 describe potential social and environmental impacts that require particular attention specifically within emerging markets. Where social or environmental impacts are anticipated, the developer is required to manage them through its ESMS consistent with Performance Standard 1.

Given the nature of the Mirach Solar PV Project it is anticipated at this stage of the S&EIA process that Performance Standards 1, 2, 3, 4, 6, and 8 may be applicable to the development.

Table 3.1: Legislative Context Relevant to the Mirach Solar PV Project

Legislation and Relevant Authority	Summary and Relevance for the Development
<p>The Constitution of South Africa (Act No. 108 of 1996)</p> <p>Administering Authority:</p> <p>National Government</p>	<p>The Constitution is the supreme law of the Republic and all law and conduct must be consistent with the Constitution. The Chapter on the Bill of Rights contains a number of provisions, which are relevant to securing the protection of the environment. Section 24 states that “everyone has the right to (a) an environment that is not harmful to their health or well-being and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution therefore, compels the government to give effect to the people’s environmental rights and places the government under a legal duty to act as a responsible custodian of the country’s environment. It compels the government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development.</p> <p>The development of the Mirach Solar PV Project and the aspects related thereto considers the creation of an environment which is not harmful or degraded through the implementation of appropriate mitigation measures.</p>
<p>The National Environmental Management Act (Act No. 107 of 1998)</p>	<p>NEMA provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management. Some of the principles in the Act are accountability; affordability; cradle to grave management; equity; integration; open information;</p>

<p>Administering Authority:</p> <p>National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment) and the Limpopo Province Department of Economic Development, Environment and (DEDET)</p>	<p>polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice.</p> <p>The mandate for EIA lays with the National Environmental Management Act (107 of 1998) and the EIA Regulations No. 324, 325, 326, and 327 promulgated in terms of Section 24 of NEMA. The EIA Regulations determine that an Environmental Authorisation is required for certain listed activities, which might have a detrimental effect on the environment.</p> <p>The S&EIA process undertaken for the Mirach Solar PV Project is in-line with the requirements of NEMA for the Application for Environmental Authorisation.</p>
<p>The National Energy Act (Act No. 34 of 2008)</p> <p>Administering Authority:</p>	<p>One of the objectives of the National Energy Act was to promote diversity of supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources, including solar: "To ensure that diverse energy resources are available, in sustainable quantities, and at affordable prices, to the South African economy, in support of economic growth and poverty alleviation, taking into account environmental management requirements (...); to provide for (...) increased generation and consumption of renewable energies..." (Preamble).</p>

<p>Department of Mineral Resources and Energy</p>	<p>Considering that the Mirach Solar PV Project is proposed to make use of PV technology and the solar resource for the generation of electricity, the proposed project is in-line with the Act.</p>
<p>Electricity Regulation Act (Act No. 4 of 2006) (as amended)</p> <p>Administering Authority:</p> <p>National Energy Regulator of South Africa (NERSA)</p>	<p>The Act provides a national regulatory framework for the electricity supply industry. The Act requires registration and licensing of anyone wanting to generate, transmit, reticulate, distribute, trade, or import and export electricity.</p> <p>One of the requirements for the REIPPPP is for the Proponent to hold an environmental authorisation for the proposed project. The REIPPPP is guided by the National Energy Act, one of the purposes of which is to promote sustainable development of renewable energy infrastructure.</p>
<p>The National Water Act (Act No. 36 of 1998)</p> <p>Administering Authority:</p> <p>Department of Water Affairs (now known as Department of Water and Sanitation)</p>	<p>Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources. The intention of the Act is to promote equitable access to water and the sustainable use of water, redress past racial and gender discrimination, and facilitate economic and social development. The Act provides the rights of access to basic water supply and sanitation, and environmentally, it provides for the protection of aquatic and associated ecosystems, the reduction and prevention of pollution and degradation of water resources.</p> <p>As this Act is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public</p>

	<p>interest, a person can only be entitled to use water if the use is permissible under the Act. Chapter 4 of the Act lays the basis for regulating water use.</p> <p>Two depression wetlands are located within the development footprint and one dam. The development footprint has been carefully placed within the development area so as to avoid the sensitive wetlands present, including the relevant buffer areas. Should a water use license be required for the project, the National Water Act will be applicable in terms of obtaining the relevant license.</p> <p>Refer to the Wetland Baseline and Risk Assessment (Appendix E2).</p>
<p>National Environmental Management: Biodiversity Act (10 of 2004) (NEMBA)</p> <p>Administering Authority:</p> <p>Department of Forestry, Fisheries and the Environment (DFFE)</p>	<p>"The Act calls for the management of all biodiversity within South Africa. The 2007 Threatened or Protected Species Regulations (GN.R. 150, as amended) provides protection through a permit system as well as through the identification of restricted activities. If required, the relevant permits will be applied for."</p> <p>The Act also provides for duty of care with regards to control of alien species.</p>

<p>National Environmental Management: Waste Act (Act No. 59 of 2008)</p> <p>Administering Authority:</p> <p>Department of Forestry, Fisheries and the Environment (DFFE)</p>	<p>NEMWA has been developed as part of the law reform process enacted through the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS). The objectives of the Act relate to the provision of measures to protect health, well-being and the environment, to ensure that people are aware of the impact of waste on their health, well-being and the environment, to provide for compliance with the measures, and to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.</p> <p>Regulations No. R921 (of 2013) promulgated in terms of Section 19(1) of the National Environmental Management: Waste Act (59 of 2008) determines that no person may commence, undertake or conduct a waste management activity listed in this schedule unless a license is issued in respect of that activity. It is not envisaged that a waste permit will be required for the proposed development as no listed activities in terms of waste management are expected to be triggered.</p>
<p>National Environment Management: Air Quality Act (Act No. 39 of 2004)</p> <p>Administering Authority:</p>	<p>The objective of this Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air in the Republic; the prevention of air pollution and ecological degradation; and securing ecologically sustainable development while promoting justifiable economic and social development.</p> <p>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development.</p>

<p>Department of Forestry, Fisheries and the Environment (DFFE)</p>	
<p>The National Heritage Resources Act (Act No. 25 of 1999)</p> <p>Administering Authority:</p> <p>South African Heritage Resources Agency (SAHRA)</p>	<p>The Act aims to introduce an integrated and interactive system for the management of heritage resources, to promote good governance at all levels, and empower civil society to nurture and conserve heritage resources so that they may be bequeathed to future generations and to lay down principles for governing heritage resources management throughout the Republic. It also aims to establish the South African Heritage Resources Agency together with its Council to co-ordinate and promote the management of heritage resources, to set norms and maintain essential national standards and to protect heritage resources, to provide for the protection and management of conservation-worthy places and areas by local authorities, and to provide for matters connected therewith.</p> <p>The Act protects and manages certain categories of heritage resources in South Africa. For the purposes of the Heritage Resources Act, a “heritage resource” includes any place or object of cultural significance. In this regard the Act makes provision for a person undertaking an activity listed in Section 28 of the Act to notify the resources authority. The resources authority may request that a heritage impact assessment be conducted if there is reason to believe that heritage resources will be affected.</p> <p>A case file with reference number 21199 has been opened on SAHRIS for the Mirach Solar PV Project and all relevant documents have been submitted for their comments and approval. The Heritage Impact Assessment undertaken for the solar PV facility is included as Appendix E7. Due to the low Palaeontological sensitivity of the site, a Palaeontological Desktop Assessment has been undertaken (Appendix E8).</p>

<p>Conservation of Agricultural Resources Act (Act No. 85 of 1983)</p> <p>Administering Authority:</p> <p>National and Provincial Government</p>	<p>The objective of the Act is to provide control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.</p> <p>Consent will be required from the Department of Agriculture, Forestry and Fisheries (now known as the DFFE) in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long-term lease agreement. A Soils and Agricultural Compliance Statement have been provided for the Mirach Solar PV Project and included as Appendix E4.</p>
<p>Subdivision of Agricultural Land Act (70 of 1970) (SALA)</p> <p>Administering Authority:</p> <p>Department of Agriculture, Land Reform and Rural Development (DALRRD)</p>	<p>The purpose of this Act is to control the subdivision of agricultural land and, in connection therewith, the use of agricultural land. Applications are lodged with the Department of Agriculture, Land Reform and Rural Development (DALRRD) to allow for the subdivision of agricultural land, as well as other prohibited actions in terms of the Act. In order to limit the potential threat that solar energy development could pose to agricultural production and to the agricultural economy, DALRRD created the 10% rule to inform the decision of whether a solar energy development on agricultural land should be approved or not. This rule states that a solar energy facility may not utilise more than 10% of the surface area of a farm. Its aim was to ensure that each farm unit remained predominantly agricultural rather than certain farms abandoning agricultural production in favour of renewable energy generation.</p>

<p>Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA)</p> <p>Administering Authority: Provincial Authority</p>	<p>This suite of legislation provides the framework for spatial planning and regulates the use and development of land.</p>
<p>The National Forests Act, 1998 (Act 84 of 1998)</p> <p>Administering Authority: Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)</p>	<p>The purpose of this Act is to:</p> <ul style="list-style-type: none"> (a) promote the sustainable management and development of forests for the benefit of all; (b) create the conditions necessary to restructure forestry in State forests; (c) provide special measures for the protection of certain forests and trees; (d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. (e) promote community forestry; (f) promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.

	<p>Section 12(1) read with S15(1) of the NFA stated that the Minister may declare a particular tree, group of trees, woodland; or trees belonging to a particular species, to be a protected tree, group of trees, woodland or species. A list of protected tree species was gazetted in GN.R. 635 of 6 December 2019. The effect of the declaration is that no person may (a) cut, disturb, damage or destroy; or (b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived from a protected tree, except under a license granted by the Minister; or in terms of an exemption published by the Minister in the Gazette.</p> <p>A Terrestrial Ecology Baseline and Impact Assessment has been undertaken for the Mirach Solar PV Project and is included in Appendix E1.</p>
<p>National Road Traffic Act (93 of 1996) (NRTA)</p> <p>Administering Authority:</p> <p>Department of Roads and Public Works</p>	<p>Certain vehicles and loads cannot be moved on public roads without exceeding the limitations in terms of the dimensions and/or mass as prescribed in the Regulations of the NRTA. Due to the large size of some of the facility’s components, they will need to be transported via “abnormal loads”.</p> <p>The site is in close proximity to the R510 Regional Road therefore providing easy access to the site. Some roads have been identified for upgrade to ensure that the heavy vehicles can reach the site.</p>
<p>Limpopo Environmental Management Act (7 of 2003)</p>	<p>The objectives of the Act are to:</p> <ul style="list-style-type: none"> a) Manage and protect the environment in the Province; b) Secure ecologically sustainable development and responsible use of natural resources in the Province;

<p>Administering Authority:</p> <p>Limpopo Department of Economic Development, Environment and Tourism</p>	<p>c) Generally to contribute to the progressive realisation of the fundamental rights contained in section 24 of the Constitution of the Republic of South Africa; and</p> <p>d) Give effect to international agreements effecting environmental management which are binding on the Province.</p> <p>Furthermore, the Act provides specific Schedules for the province in terms of protected areas, protected animals, game, non-endemic wild animals, undesirable animals, prohibited aquatic growths and protected plants.</p> <p>This Act is therefore relevant to the Mirach Solar PV Project as the proposed development is located within the Limpopo Province and therefore the requirements of the Act will need to be adhered to.</p>
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Table 3.2: Policy Context Relevant to the Mirach Solar PV Project

Policy and Relevant Authority	Summary and Relevance for the Development
<p>The White Paper on the Energy Policy of the Republic of South Africa (1998)</p> <p>Administering Authority:</p>	<p>The White Paper on the Energy Policy of the Republic of South Africa establishes the international and national policy context for the energy sector, and identifies the following energy policy objectives:</p> <ul style="list-style-type: none"> • Increasing access to affordable energy services • Improving energy governance • Stimulating economic development • Managing energy-related environmental and health impacts • Securing supply through diversity • Energy policy priorities

<p>Department of Mineral Resources and Energy</p>	<p>The White Paper sets out the advantages of renewable energy and states that the Government believes that renewables can in many cases provide the least cost energy service, particularly when social and environmental costs are included. The White Paper acknowledges that South Africa has neglected the development and implementation of renewable energy applications, despite the fact that the country’s renewable energy resource base is extensive, and many appropriate applications exist.</p> <p>The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:</p> <ul style="list-style-type: none"> • Minimal environmental impacts in operation in comparison with traditional supply technologies; and • Generally lower running costs, and high labour intensities. <p>Disadvantages include:</p> <ul style="list-style-type: none"> • Higher capital costs in some cases; • Lower energy densities; and • Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems. <p>The Mirach Solar PV Project is in line with this policy as it proposes the generation of renewable energy from the solar resource.</p>
<p>The White Paper on Renewable Energy (2003)</p>	<p>This White Paper on Renewable Energy supplements the White Paper on Energy Policy, which recognises that the medium and long-term potential of renewable energy is significant. This Paper sets out the Government’s vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.</p>

<p>Administering Authority:</p> <p>Department of Mineral Resources and Energy</p>	<p>The White Paper notes that while South Africa is well-endowed with renewable energy resources that have the potential to become sustainable alternatives to fossil fuels, these have thus far remained largely untapped. Government’s long-term goal is the establishment of a renewable energy industry producing modern energy carriers that will offer in future years a sustainable, fully non-subsidised alternative to fossil fuels. The medium-term (10-year) target set in the White Paper is: <i>10 000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).</i></p> <p>The Mirach Solar PV Project is in line with this paper as it proposes the generation of renewable energy from the solar resource.</p>
<p>Integrated Resource Plan (IRP) for South Africa (2010-2030)</p> <p>Administering Authority:</p> <p>Department of Mineral Resources and Energy</p>	<p>The Integrated Resource Plan for Electricity for South Africa of 2010–2030 (further referred to as the IRP) is a “living plan” which is expected to be revised and updated continuously as necessary due to changing circumstances. According to the Summary of the plan the current IRP for South Africa, which was originally initiated by the Department of Energy (DoE) in June 2010 (the Department is now known as Department of Mineral Resources and Energy), led to the Revised Balanced Scenarios (RBS) for the period 2010–2030.</p> <p>“This scenario was derived based on the cost-optimal solution for new build options (considering the direct costs of new build power plants), which was then “balanced” in accordance with qualitative measures such as local job creation”. In addition to all existing and committed power plants, the RBS included 11,4 GW of renewables, which relates to the proposed Mirach Solar PV Project. In 2010 several changes were made to the IRP model. The main</p>

changes in the IRP were the disaggregation of renewable energy technologies to explicitly display solar photovoltaic (PV), concentrated solar power (CSP), and wind options (RSA, 2011a).

The summary of the IRP further explains that traditional cost-optimal scenarios were developed based on the previously mentioned changes in the IRP. This resulted in the Policy-Adjusted IRP, which stated that:

“The installation of renewables (solar PV, CSP and wind) has been brought forward in order to accelerate a local industry; To account for the uncertainties associated with the costs of renewables and fuels, a nuclear fleet of 9,6 GW is included in the IRP; The emission constraint of the RBS (275 million tons of carbon dioxide per year after 2024) is maintained; and Energy efficiency demand-side management (EEDSM) measures are maintained at the level of the RBS” (RSA, 2011a:6).

“The Policy-Adjusted IRP includes the same amount of coal and nuclear new builds as the RBS, while reflecting recent developments with respect to prices for renewables. In addition to all existing and committed power plants (including 10 GW committed coal), the plan includes 9,6 GW of nuclear; 6,3 GW of coal; 17,8 GW of renewables; and 8,9 GW of other generation sources” (RSA, 2011a:6).

The IRP highlights the commitments before the next IRP. The commitments pertaining to the purpose of the proposed project in renewable energy is: “Solar PV programme 2012-2015: In order to facilitate the connection of the first solar PV units to the grid in 2012 a firm commitment to this capacity is necessary. Furthermore, to provide the security of investment to ramp up a sustainable local industry cluster, the first four years from 2012 to 2015 require firm commitment.”

“Solar PV 2016 to 2019: As with wind, grid upgrades might become necessary for the second round of solar PV installations from 2016 to 2019, depending on their location. To trigger the associated tasks in a timely manner, a firm commitment to these capacities is necessary in the next round of the IRP at the latest. By then, the assumed cost decreases for solar PV will be confirmed” (IRP, 2011a:17).

In conclusion the IRP recommends that an accelerated roll-out in renewable energy options should be allowed with regards to the benefits of the localization in renewable energy technologies (RSA, 2011a). It is however important to take note that since the release of the IRP in 2011 there has been a number of developments in the energy sector of South Africa. Therefore, the IRP was updated and was open for comments until March of 2017. The new IRP of 2019 was formally published in October 2019. For the revision scenario, analysis was conducted. The results revealed that for the period ending 2030 that: “The committed Renewable Energy Independent Power Producers Programme, including the 27 signed projects and Eskom capacity rollout ending with the last unit of Kusile in 2022, will provide more than sufficient capacity to cover the projected demand and decommissioning of plants up to approximately 2025”; “Imposing annual build limits on renewable energy will not affect the total cumulative capacity and the energy mix for the period up to 2030”; and “the scenario without renewable energy annual build limits provides the least-cost option by 2030” (RSA, 2018:34).

Lastly, the draft IRP of 2018 also included the scenario analysis for the period post 2030. Here it was observed that: “Imposing annual build limits on renewable energy will restrict the cumulative renewable installed capacity and the energy mix for this period; adopting no annual build limits on renewables or imposing a more stringent strategy to reduce greenhouse gas emissions implies that no new coal power plants will be built in the future unless affordable cleaner forms of coal-to-power are available; and the scenario without renewable energy annual build limits provides the least-cost option by 2050” (RSA, 2018:34–35).

	<p>In the final IRP of 2019 key considerations were taken into account together with required actions to be taken for the IRP of 2019 to be credible. In terms of renewable energy technologies like solar and wind, the IRP stated that “The application of renewable build limits ‘smoothes out’ the capacity allocations for wind and solar PV which provides a constant pipeline of projects to investment; this addresses investor confidence”. The decision stated against this key consideration is to “retain the current annual build limits on renewables (wind and PV) pending the finalization of a just transition plan” (RSA, 2019:46). Hereby the IRP also recognises renewable technologies’ potential to diversify the electricity mix, create new industries and job opportunities and localize across the value chain (RSA, 2019:13).</p> <p>The Mirach Solar PV Project is in line with this plan as it proposes the generation of renewable energy from the solar resource and will contribute to the energy mix of the country as set out in this plan.</p>
<p>National Development Plan of 2030</p> <p>Administering Authority:</p> <p>The Presidency:</p> <p>National Planning Commission</p>	<p>The National Development Plan aims to “eliminate poverty and reduce inequality by 2030” (RSA, undated). In order to eliminate or reduce inequality, the economy of South Africa needs to grow faster in order to benefit all South Africans. In May 2010 a Draft National development Plan was drafted, which highlighted the nine (9) key challenges for South Africa. The highest priority areas according to the plan are considered to be the creation of employment opportunities and to improve the quality of national education. In this regard, the plan sets out three (3) priority areas, namely, to raise employment by a faster growing economy, improve the quality of education, and to build the capability of the state in order to play a more developmental and transformative role. One of the key challenges identified was that the economy is operating in an unsustainable resource intensive manner and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge.</p>

	<p>The Mirach Solar PV Project will contribute to the intervention strategy as identified within the plan.</p>
<p>National Infrastructure Plan of South Africa (2012)</p> <p>Administering Authority:</p> <p>Presidential Infrastructure Coordinating Commission</p>	<p>In the year 2012 the South African Government adopted a National Infrastructure Plan (hereafter referred to as the Plan). The aim of this Plan is to transform the economic landscape, while strengthening the delivery of basic services and creating new employment opportunities. This Plan also supports the integration of African communities, and also sets out the challenges and enablers that our country needs in order to respond to the planning and development of infrastructure with regards to fostering economic growth (RSA, 2012). The Plan has developed strategic integrated projects (further referred to as SIPs). These SIPs stretch over all nine (9) provinces, covering social and economic infrastructure, and projects that enhance development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. The three (3) SIPs according to the Plan, which are energy focused and correlate to the proposed project are as follow:</p> <ul style="list-style-type: none"> • SIP 8: Green energy in support of the South African economy; • SIP 9: Electricity generation to support socio-economic development; and • SIP 10: Electricity transmission and distribution for all. <p>SIP 8 according to the Plan “support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the IRP 2010 and support biofuel production facilities”. The purpose of SIP 9 according to the Plan is to “accelerate the construction of new electricity generation capacity in accordance with the IRP 2010 to meet the needs of the economy and address historical imbalances”. SIP 9 should also monitor the implementation of major projects such as new power stations like Medupi, Kusile and Ingula. Lastly, SIP 10</p>

	<p>aims to “expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development” (RSA, 2012:20).</p> <p>The Mirach Solar PV Project is in line with this plan as it proposes the generation of renewable energy from the solar resource which supports socio-economic development and will contribute to meeting the electricity demand of the country as set out in this plan.</p>
<p>New Growth Path Framework</p> <p>Administering Authority:</p> <p>Department of Economic Development</p>	<p>The New Growth Path was developed after 16 years of South Africa’s democracy, to respond to emerging opportunities and risks while building on policies. This framework provides a dynamic vision on how to collectively achieve a more developed, equitable and democratic society and economy. This framework mainly reflects the commitment of the South African Government to create employment opportunities for its people in all economic policies (RSA, 2011b).</p> <p>This framework sets out the markers for job creation and growth and identifies where there are viable changes in the character and structure of production, in order to create a more inclusive, greener economy in the long-term. It is stated in the framework that in order for this framework to reach its objectives, the Government is committed to:</p> <ul style="list-style-type: none"> • Identify the possible areas of employment creation; and • Develop a policy to facilitate employment creation especially with regards to social equity, sustainable employment and growth in the creation of employment activities (RSA, 2011b). <p>This framework also identifies investments in five key areas, one of which is energy. This framework also states that the green economy is a priority area, which includes the construction of and investment in renewable energy</p>

	<p>technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term.</p> <p>Considering that the construction of and investment in renewable energy is a key area identified within the framework, the Mirach Solar PV Project is considered to be in-line with the framework.</p>
<p>Climate Change Bill (2018)</p> <p>Administering Authority:</p> <p>National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)</p>	<p>On 08 June 2018 the Minister of Environmental Affairs published the Climate Change Bill (“the Bill”) for public comment. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa’s sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The following objectives are set within the Bill:</p> <ul style="list-style-type: none"> • Provide for the coordinated and integrated response to climate change and its impacts by all spheres of government in accordance with the principles of cooperative governance; • Provide for the effective management of inevitable climate change impacts through enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to building social, economic, and environmental resilience and an adequate national adaptation response in the context of the global climate change response; • Make a fair contribution to the global effort to stabilise greenhouse gas concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe and in a manner that enables economic, employment, social and environmental development to proceed in a sustainable manner.

	<p>The Mirach Solar PV Project comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.</p>
<p>Climate Change Bill (2021)</p> <p>Administering Authority:</p> <p>National Department of Forestry, Fisheries and the Environment</p>	<p>The Department of Forestry, Fisheries and the Environment has published a new Climate Change Bill for public comment. The bill notes that climate change represents an urgent threat to human societies and the planet, and requires an effective, progressive and incremental response from both government and citizens. It recognises that South Africa has a global responsibility to reduce greenhouse gases and that the anticipated impacts arising as a result of climate change have the potential to undermine achieving the country’s developmental goals.</p> <p>The main objective of the bill is to enable the development of an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society, and to provide for matters connected therewith.</p> <p>The Mirach Solar PV Project comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.</p>
<p>Strategic Integrated Projects (SIPs) (2010 – 2030)</p> <p>Administering Authority:</p> <p>The Presidential Infrastructure</p>	<p>The Presidential Infrastructure Coordinating Committee (PICC) is integrating and phasing investment plans across 18 Strategic Infrastructure Projects (SIPs) which have five core functions: to unlock opportunity, transform the economic landscape, create new jobs, strengthen the delivery of basic services and support the integration of African economies. A balanced approach is being fostered through greening of the economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development and enabling regional integration. SIP 8 and 9 of the energy SIPs supports the development of the solar energy facility:</p>

<p>Coordinating Committee</p>	<ul style="list-style-type: none"> • SIP 8: Green energy in support of the South African economy: Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP 2010 – 2030) and supports biofuel production facilities. • SIP 9: Electricity generation to support socio-economic development: The proposed Mirach Solar PV Project is a potential SIP 9 Project as electricity will be generated and social and economic upliftment, development and growth will take place within the surrounding communities. It would become a SIP 9 project if selected as a Preferred Bidder project by the Department of Mineral Resources and Energy. SIP 9 supports the acceleration of the construction of new electricity generation capacity in accordance with the IRP to meet the needs of the economy and address historical imbalances. <p>The Mirach Solar PV Project could be registered as a SIP project. The project would then contribute to the above-mentioned SIPs.</p>
<p>Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014)</p> <p>Administering Authority:</p>	<p>The Department of Forestry, Fisheries and the Environment (DFFE) has committed to contribute to the implementation of the National Development Plan and National Infrastructure Plan by undertaking Strategic Environmental Assessments (SEAs) to identify adaptive processes that integrate the regulatory environmental requirements for Strategic Integrated Projects (SIPs) while safeguarding the environment. The wind and solar photovoltaic (PV) SEA was accordingly commissioned by DEA in support of SIP 8, which aims to facilitate the implementation of sustainable green energy initiatives.</p> <p>This SEA identifies areas where large scale wind and solar PV energy facilities can be developed in terms of SIP 8 and in a manner that limits significant negative impacts on the environment, while yielding the highest possible</p>

<p>National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)</p>	<p>socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs).</p> <p>The REDZs also provide priority areas for investment into the electricity grid. Currently one of the greatest challenges to renewable energy development in South Africa is the saturation of existing grid infrastructure and the difficulties in expanding the grid. Proactive investment in grid infrastructure is likely to be the most important factor in determining the success of REDZs. Although it is intended for the SEA to facilitate proactive grid investment in REDZs, such investment should not be limited to these areas. Suitable wind and solar PV development should still be promoted across the country and any proposed development must be evaluated on its own merit.</p> <p>The Mirach Solar PV Project is not located within a REDZ, but the development will contribute to the expansion of renewable energy facilities and infrastructure within the country and the Thabazimbi area, and provide the positive opportunities associated with it.</p>
<p>Limpopo Development Plan (LDP) 2020 – 2025 Administering Authority: Limpopo Provincial Department</p>	<p>The Limpopo Development Plan (LDP) 2020-2025 is the socio-economic development blueprint for the Limpopo Province. It outlines the contribution of the Limpopo Province to the National Development Plan (NDP) and provides a framework for the strategic plans of provincial government departments and municipalities in the province. The LSDF should build on and give spatial expression to the LDP 2020-2025 components, where possible and relevant. The LDP also creates a structure for the constructive participation of private-sector business, organised labour and citizens, towards the achievement of the provincial growth and development objectives.</p>

	<p>The LDP 2020-2025 defines the provincial long-term vision as “Limpopo – Africa’s New Pride. A resilient, vibrant, prosperous Province inspired by its diverse and creative people and its environment.”</p> <p>The objectives of the Limpopo Development Plan are the following:</p> <ul style="list-style-type: none"> • Ensure sustainable development. • Create decent employment through inclusive economic growth and sustainable livelihoods. • Improve the quality of life of citizens. • Raise the effectiveness and efficiency of a developmental public service. • Promote vibrant and equitable sustainable rural communities. • Prioritise social protection and social investment. <p>The development of the Mirach Solar PV Project is in line with the framework, based on the contributions and opportunities presented by a development of this nature.</p>
<p>Limpopo Provincial Spatial Development Framework (PSDF) (2022)</p> <p>Administering Authority:</p> <p>Limpopo Provincial Department</p>	<p>The spatial vision of the Limpopo Province is as follows:</p> <p><i>“The Limpopo PSDF envisions a provincial spatial structure where the natural environment and valuable agricultural land are protected for future generations, with a strong, diverse and growing economy, and that offers its residents high quality living environments and good job opportunities”.</i></p> <p>The Provincial Spatial outcomes contextualized for the Limpopo Province is as follows:</p> <p>Provincial Spatial Outcome One</p> <p>A network of consolidated, transformed and well-connected urban nodes, regional development anchors and rural service centres that enable Limpopo to derive maximum transformative benefit from urbanisation and concentrated</p>

rural settlements, enabling climate change adaptation, inclusive economic development and equal, effective and efficient access to social services in support of equitable and inclusive provincial human capital development.

Provincial Spatial Outcome Two

Provincial-scale corridors and productive rural regions enable sustainable livelihoods supported by economic diversification through green industrialisation and participation in the Fourth Industrial Revolution, mutually beneficial urban-rural linkages, and wise management, nurturing and conservation of ecological assets and ecosystem services.

Provincial Spatial Outcome Three

Provincial connectivity and movement infrastructure systems are strategically located, extended and maintained, to support a diverse, ecologically sustainable, adaptive, regenerative and inclusive economy, and a set of key provincial, national and regional gateway cities and towns.

Provincial Spatial Outcome Four

Productive rural regions are supported by sustainable resource economies and strong and resilient regional development anchors provide effective, efficient and equitable access to people living in rural areas to the provincial, national and global economy.

Provincial Spatial Outcome Five

The provincial ecological infrastructure and natural resource foundation are well-protected and managed, to enable climate change mitigation and sustainable and equitable access to water, high-potential agricultural land, minerals and other natural resources, both for current and future generations.

	<p>The Provincial objectives are as follows:</p> <ul style="list-style-type: none"> • Capitalise on the Province’s strategic location within the SADC region to facilitate trade links and regional cooperation on resource sharing; • Capitalise on, and improve regional and local connectivity to establish a connected network of nodes and settlements; • Provide a strategic and coherent rationale for public sector investment, including engineering, community and economic infrastructure, to optimise service delivery; • Encourage urban and rural spatial restructuring to address spatial injustice and facilitate climate change mitigation and adaptation; • Aggressively protect and enhance the province’s natural resources, including scarce fresh water sources and high biodiversity landscapes; • Guard valuable agricultural land as a scarce resource and national asset; • Consolidate and enhance the province’s ecotourism product; • Encourage and institutionalise the sustainable development of its massive mineral potential and encourage diversification and industrialisation through green economy initiatives; and • Create an enabling environment for both large- and small-scale business development (retail, office, commercial, industrial). <p>The Mirach Solar PV Project is in line with the provincial framework and supports the development of renewable energy generation and seeks to promote such developments as part of improved energy sustainability.</p>
<p>Waterberg DM Final Integrated</p>	<p>The Integrated Develop Plan is a mandatory and overarching process run collectively by all role players within the municipality to achieve developmental objectives of local government. Developmental Local Government has an</p>

<p>Development Plan (IDP) 2020–2021 (2020)</p>	<p>obligation to provide basic services through an interaction between numerous stakeholders within the municipal area. It is through this collective interaction commonly known as the <i>“The Theatre of planning”</i> that we intend to address service delivery challenges facing the municipality and our communities.</p>
<p>Administering Authority:</p>	<p>The vision of the Waterberg DM is <i>“To be the best energy hub and eco-tourism destination in Southern Africa.”</i></p>
<p>Waterberg Municipality</p>	<p>The Mission Statement is: <i>“To invest in a constituency of talented human capital who are motivated and innovative to build a sustainable economy in the field of energy, minerals and eco-tourism for the benefit of all our communities”</i>.</p> <p>The above vision and mission statements are supported by certain values that drive the attitudes and behaviour of politicians and administration of the Waterberg District Municipality are confirmed as:</p> <ul style="list-style-type: none"> • Honesty • Respect • Fairness • Integrity • Accountability • Accessibility • Effectiveness • Ubuntu

	<p>The IDP of the municipal area within which the Mirach Solar PV Project is located therefore supports the development of renewable energy generation and seeks to promote such developments as part of improved energy sustainability.</p>
<p>Waterberg District Spatial Development Framework (SDF) (2021)</p> <p>Administering Authority:</p> <p>Waterberg District Municipality</p>	<p>The Waterberg SDF poses the following spatial vision for the district: <i>"A spatially functional and equitable district that is a conducive living environment for all, an energy hub and eco-tourism destination"</i>.</p> <p>The spatial development objectives of the Waterberg SDF are as follows:</p> <ul style="list-style-type: none"> • A spatially functional District: Ensure a spatially functional district that optimises the use of resources and achieve a sustainable balance between macro land uses; • Integrated sustainable human settlements: Ensure that integrated and sustainable human settlements are developed that redress spatial imbalances and promote inclusive and sustainable land development; • Investment in targeted nodes: Ensure that development in higher order urban nodes is prioritised and that such nodes provide a range of development opportunities according to the comparative advantages and needs of the communities; • Sustainable rural livelihoods: Improve rural areas by creating integrated and sustainable livelihoods; • A connected District: Ensure a well-functioning District that is connected and provide digital connectivity, convenience and economic prosperity; • Integrated and consolidated service delivery: Ensure a functional District and conducive living conditions for all the residents by following an integrated approach in providing engineering infrastructure by all spheres of government. <p>The development of the Mirach Solar PV Project will contribute to the goals of the area, albeit to a limited extent.</p>

<p>Thabazimbi Municipality Integrated Development Plan 2021-2022 (2021) Administering Authority:</p> <p>Thabazimbi Municipality</p>	<p>Local Draft Plan</p> <p>Local</p>	<p>The IDP for the LM has legal status. It is the instrument for the strategic management of the Municipality and decision-making by Council. The IDP ensures a cooperative approach by the National, Provincial and Local spheres of government to develop and implement projects and programmes on a Priority basis which will empower and benefit the community. The IDP highlights the vision and mission statements of the LM that they strive to achieve.</p> <p>The vision of the LM is to be <i>“a leading ecotourism Municipality in the provision of sustainable and excellent services”</i>. The vision is supported by the mission statement that is <i>“Promote, co-ordinate, implement the financial and environmental growth and development through a committed staff and partnership with communities and stakeholders”</i>.</p> <p>To further support the vision and mission statements, certain values was identified namely:</p> <ul style="list-style-type: none"> • Accountable • Transparent • Community Centred • Honest Human Capital <p>The development of the Mirach Solar PV Project will contribute to the goals of the area, albeit to a limited extent.</p>
<p>Thabazimbi Municipality Development Framework (2018)</p>	<p>LM Local Spatial</p>	<p>Spatial Rationale seeks to strengthen and create sustainable human settlements through application of spatial planning and land use systems and practices. The Municipality intends to embark on a process of reviewing its Spatial Development Framework 2015 (SDF) and Town Planning Scheme 2014 which must be aligned to Spatial Planning and Land Use Management Act, Act 16 of 2013 (SPLUMA) and its Regulations. The Municipal Systems Act, 2000 mandates the incorporation of the SDF into the IDP as a sector plan with the intension to provide spatial direction. it is therefore important that the SDF and the IDP are aligned. The Limpopo Spatial Development</p>

<p>Administering Authority: Thabazimbi Municipality</p> <p style="text-align: center;">Local</p>	<p>Framework and existing SDF identified the following nodal areas in the Thabazimbi Municipal Area, namely the (i.) Provincial Growth Point (PGP) being the Thabazimbi Town, and (ii.) Municipal Growth Point (MGP) being the Northam Town. Both of these towns play a critical role in the sustenance of the municipality both spatially and economically.</p> <p>The contents of the SDF for the LM are as follows:</p> <ul style="list-style-type: none"> • include a written and spatial representation of a five-year spatial development plan for the spatial form of the municipality; • include a longer-term spatial development vision statement for the municipal area which indicates a desired spatial growth and development pattern for the next 10 to 20 years; identify current and future significant structuring and restructuring elements of the spatial form of the municipality, including development corridors, activity spines and economic nodes were public and private • investment will be prioritised and facilitated; include population growth estimates for the next five years; include estimates of the demand for housing units across different socio-economic categories and the planned location and density of future housing developments; • include estimates of economic activity and employment trends and locations in the municipal area for the next five years; • identify, quantify and provide location requirements of engineering infrastructure and services provision for existing and future development needs for the next five years; • identify the designated areas where a national or provincial inclusionary housing policy may be applicable; • include a strategic assessment of the environmental pressures and opportunities within the municipal area,
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- including the spatial location of environmental sensitivities, high potential agricultural land and coastal access strips, where applicable;
- identify the designation of areas in the municipality where incremental upgrading approaches to development and regulation will be applicable;
- identify the designation of areas in which more detailed local plans must be developed; and shortened land use development procedures may be applicable and land use schemes may be so amended; provide the spatial expression of the coordination, alignment and integration of sectoral policies of all municipal departments;
- determine a capital expenditure framework for the municipality's development programmes, depicted spatially;
- determine the purpose, desired impact and structure of the land use management scheme to apply in that municipal area; and include an implementation plan comprising of sectoral requirements, including budgets and resources for implementation;
- necessary amendments to a land use scheme;
- specification of institutional arrangements necessary for implementation;
- specification of implementation targets, including dates and monitoring indicators; and specification, where necessary, of any arrangements for partnerships in the implementation process.

The development of the Mirach Solar PV Project will contribute to the goals of the area, albeit to a limited extent.

3.3 Legal Requirements Complied with in Section 3 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context.	The entire section 3 provides a description of the relevant policy and legislative context and indicates the relevance of the Mirach Solar PV Project in terms of the policy and legislation.

4 NEED AND DESIRABILITY

The need and desirability of a development is linked to whether the site is appropriate, receptive and desirable for the development of a solar facility and the need for the development on an international, national, provincial and local level. Within the EIA Phase of the EIA process the Regulations calls for the need and desirability of the development within the development footprint proposed.

4.1 Need for the Proposed Development

The need for the development has been confirmed from a regulatory perspective considering the results of section 3 that indicates how the Mirach Solar PV Project “fits” into and contributes to the electricity generation of the country and the contributions made to the fight against climate change.

The proposed project is intended to form part of the Department of Mineral Resources and Energy’s (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other appropriate energy generation programmes/opportunities. The REIPPP Programme aims to secure 14 725 Megawatts (MW) of new generation capacity from renewable energy sources, while simultaneously diversifying South Africa’s electricity mix. Eskom, the largest greenhouse gas emitter of South Africa, has committed in principle to net zero emission by 2050 and to increase its renewable capacity.

There is a current drive and trend for alternative energy in the country to combat climate change as per the Paris Agreement signed by South Africa. The Paris Agreement pursues efforts to limit the rise in the climatological average global temperature to 1.5 °C above pre-industrial levels. According to data from the Copernicus Climate Change Service, July 2023 was the hottest July on record, measuring between 1.5 °C and 1.6 °C hotter than the average before the widespread use of fossil fuels. Based on the data the need for decarbonisation is at a significant stage and must receive attention in order to ensure a Just Energy Transition (JET) for the country.

When considering the current position of South Africa in terms of CO₂ emissions, the country lies 14th in the world. The National Greenhouse Gas Inventory Report (Dec 2022) indicates in 2020 81% of the total emissions of South Africa was emitted by the energy sector. Within

the energy sector the energy industries were the main contributor (62.4%) followed by transport (12.7%) and manufacturing industries and construction (8.8%).

The CSIR Energy Centre released in February of 2023 Statistics of utility-scale power generation in South Africa for 1 Jan 2022 – 31 Dec 2022. The statistics indicate that by 2022 the country had 54 GW of capacity that was made up of the following energy mix:

- Coal (39.8 GW)
- Nuclear (1.9 GW)
- Diesel (3.4 GW)
- Hydro (0.6 GW) and pumped storage (2.7 GW)
- Wind (3.4 GW)
- Solar PV (2.3 GW)
- CSP (0.5 GW)

The statistics also indicate that during 2022 additional energy generation facilities became operational which was made up of 720 MW of coal, 419 MW of wind and 75 MW of solar PV. The statistics clearly show that coal generated electricity remains the dominating electricity resource for the country with almost double the capacity added to the grid in 2022 than that of wind energy. Therefore, the energy mix of the country is still dominated by coal fired-power generation which contributed 80% to the system demand in 2022. Refer to Figure 4.1 for an indication of the annual electricity production from 2010 to 2022.

The Energy Council of South Africa estimated in February 2023 that South Africa would need 56GW of wind and solar PV generation, 8GW of battery storage and 5GW of gas-driven power to “provide an appropriate balance between energy security and energy sustainability” by 2030. These numbers are required for the decommissioning of 12GW of older and more emission-intensive coal generation in terms of Just Energy Transition. In terms of the current developments in the country it was confirmed in June 2023 by Engineering News that 66GW of wind and solar projects are currently at different stages of development. Refer to Figure 4.1.

In early 2023 the Just Energy Transition Investment Plan (JET IP), (2023-2027), was released which sets out the scale of need and the investments required to achieve the de-carbonisation within the country. The investment plan sets out the funding requirements for the years 2023-2027 to achieve the energy transition of the country. The funding requirements are set out in Table 4.1 and 4.2.

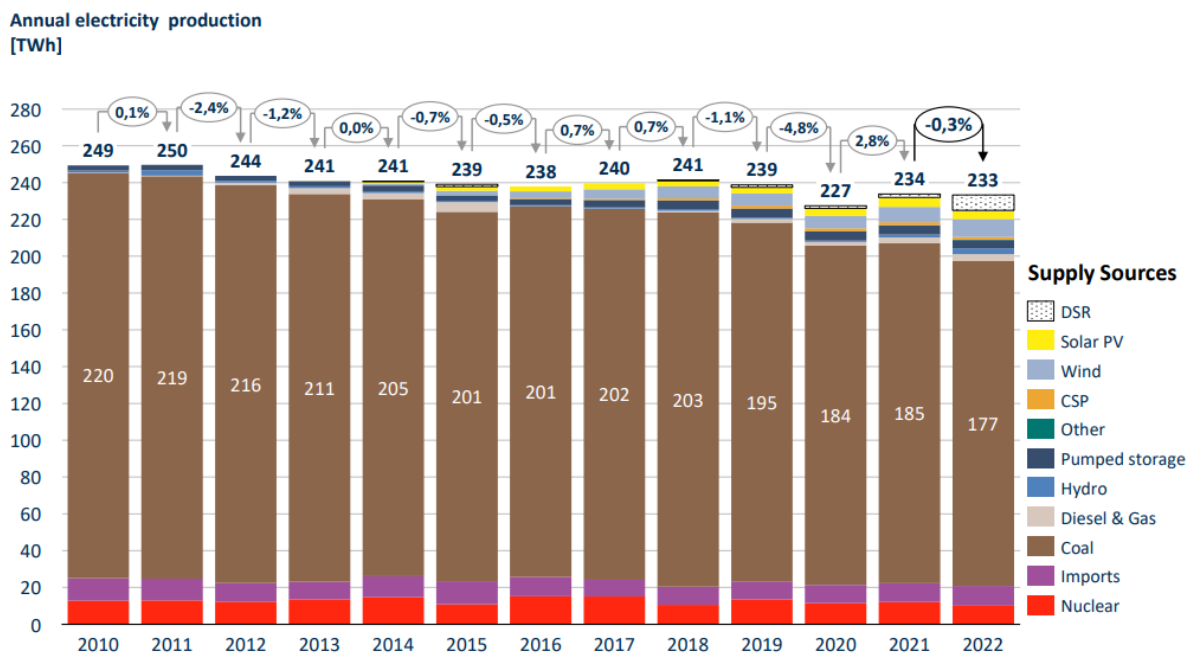


Figure 4.1: Annual electricity production in South Africa from 2010 to 2022

Table 4.1: Funding requirements for 2023-2027 as per the Just Energy Transition Investment Plan

Funding requirements 2023–2027	ZAR billion (US\$ billion)
Electricity Sector	711.4 (47.2)
New Energy Vehicle (NEV) Sector	128.1 (8.5)
Green Hydrogen (GH ₂) Sector	319 (21.2)
Skills development	2.7 (0.18)
Municipal capacity	319.1 (21.3)
TOTAL	1 480 (98.7)

Table 4.2: National electricity sector infrastructure investment needs as per the Just Energy Transition Investment Plan

National electricity sector's infrastructure investment needs	ZAR billion
Coal plant decommissioning	4.1
Transmission	131.8
Distribution	13.8
New solar photovoltaic (PV)	233.2
New wind	241.7
New batteries	23.1
TOTAL	647.7

Considering the above, there is a definite need for the development of solar PV facilities in the country.

4.2 Receptiveness of the Site and Development Footprint and Desirability of the Development

The receptiveness of the development area and development footprint for the construction and operation of the Mirach Solar PV Project has been informed by the site selection process undertaken by the Applicant. The site selection process considered specific site characteristics in order to understand whether the site is suitable for the placement of the infrastructure. Refer to section 2.3.

The main aspects considered as part of the site selection process was solar resource, land availability, access to the national grid, geographical and socio-economic considerations, availability of existing infrastructure, topography and consideration of sensitive environmental features through environmental screening. Through this process the Applicant confirmed the receptiveness of the site for the development and thereby confirmed the receptiveness of the site for the placement of the associated development footprint.

The feasibility of the site for the housing of the development footprint provides an indication of the desirability of the development within the site. The Mirach Solar PV Project is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties currently used for grazing. The affected farm portion has not been considered for an alternative future land use such as urban development, agriculture or mining.

Therefore, the site proposed for the development displays characteristics which contribute to the overall desirability for the placement of a development footprint, including all associated infrastructure for the generation of electricity.

The facility's contribution towards sustainable development and the associated benefits to society in general is listed below:

- Utilisation of significant renewable energy resources and increased supply - Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses.
- Reduced dependence on fossil fuels – The operation of the Mirach Solar PV Project will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand.
- Contribution to the fight against climate change - The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. The development of the Mirach Solar PV Project, and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO₂ emissions.
- Reduction of Pollution - The use of solar irradiation or wind for power generation is a non-consumptive use of a natural resource which produces zero emissions during its operation. The release of by-products through the burning of fossil fuels for electricity generation have a particularly hazardous impact on human health and contribute to ecosystem degradation.
- Protection for future generations - Actions to reduce our disproportionate carbon footprint can play an important part in ensuring our role in preventing dangerous anthropogenic climate change, thereby securing the natural foundations of life for generations to come; this is the basis of sustainable development.
- Socio-Economic Benefits - The project activity is likely to have significant long-term, indirect positive social impacts that may extend to a regional and even national scale. The larger scale impacts are to be derived in the utilization of solar power and the experience gained through the construction and operation of the PV facility. In future, this experience

can be employed at other similar solar installations in South Africa. As a result of the excellent renewable energy resources and competitive procurement processes, both wind power and solar PV power have now been proven as cheaper forms of energy generation in South Africa than coal power. They offer excellent value for money to the economy and citizens of South Africa while benefitting society as a whole through the development of clean energy.

- Employment - The development, procurement, installation, maintenance and management of renewable energy facilities have significant potential for job creation and skills development in South Africa. The main benefit of the proposed development operating in the area is that local companies or contractors will be hired for the duration of the construction period. The operational phase will provide permanent job opportunities to the local communities from the surrounding area since security guards and general labourers will be required on a full-time basis. Approximately 500 employment opportunities will be created during the construction phase and approximately 25 permanent employment opportunities during the operational phase.

When considering the need and desirability of the development footprint within the development area approved during the Scoping Phase this is linked to:

- The opportunities presented within the development area to implement the mitigation hierarchy through the avoidance of sensitive environmental features that are not considered to be available for development due to the environmental value that it holds within the landscape. Even with avoidance it is possible to construct and operate an efficient solar PV facility that would be able to generate up to 340 MW.
- With the slow transition to decarbonisation and the fact that no other solar energy facilities are proposed within 30km of the site, there is a need for such development within the area to kick-start the introduction of renewable energy development and solar energy generation within the Thabazimbi area.

4.3 Legal Requirements Complied with in Section 4 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(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 development footprint within the approved site as contemplated in the accepted scoping report.	The need and desirability of the development of the Mirach Solar PV Project within the development area and development footprint has been fully considered within section 4.

5 APPROACH TO THE PROCESS

The development of the Mirach Solar PV Project requires Environmental Authorisation in accordance with the requirements of Section 24 of NEMA and the 2014 EIA Regulations (GN.R. 326). The applicant has appointed Blue Crane Environmental (Pty) Ltd, as the independent environmental consultant responsible for undertaking the S&EIA process required in support of the application for EA.

This section provides an indication of the approach which has been followed as part of the S&EIA Process. A S&EIA process refers to a process undertaken in accordance with the EIA Regulations, 2014, as amended, specifically GN.R. 326 of the Regulations. The EIA process involved the consideration and identification of direct, indirect, and cumulative, environmental impacts associated with a proposed project or activity and assess the significance of the identified impacts on the environment. Figure 5.1 below provides an indication of the EIA process followed.

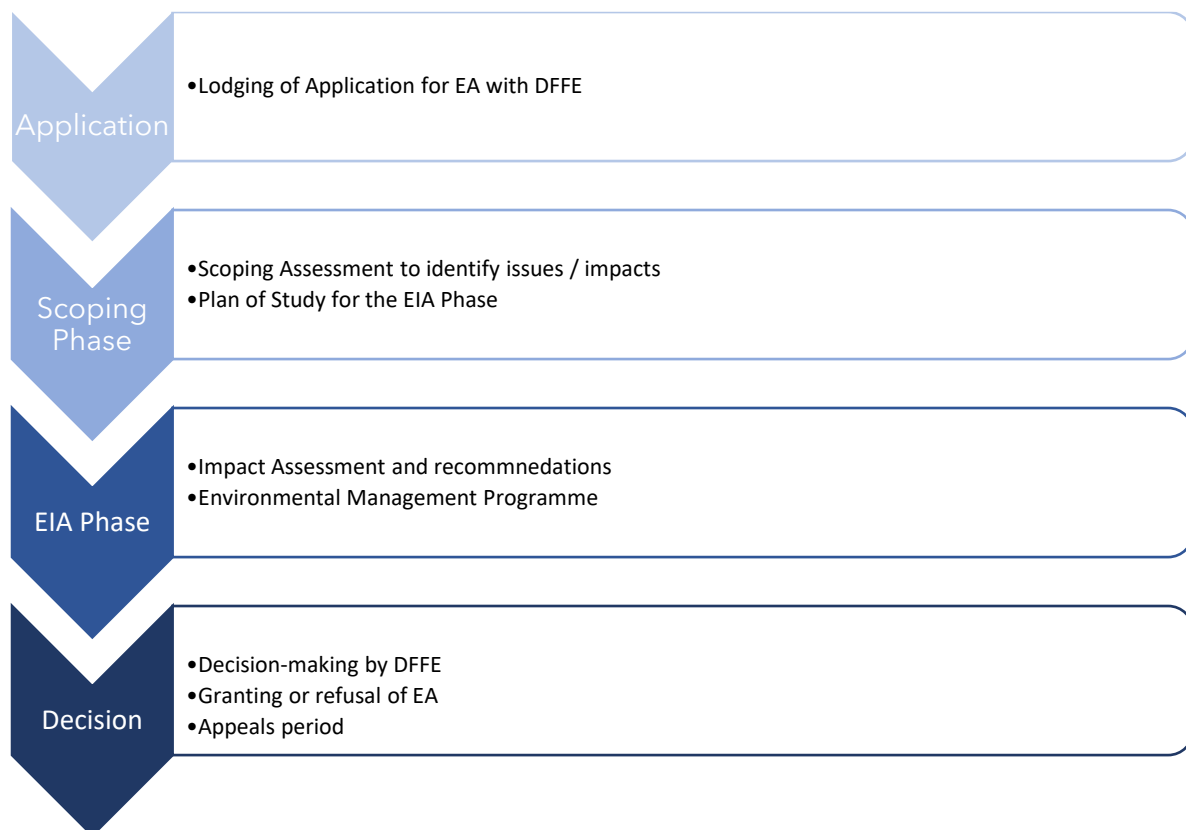
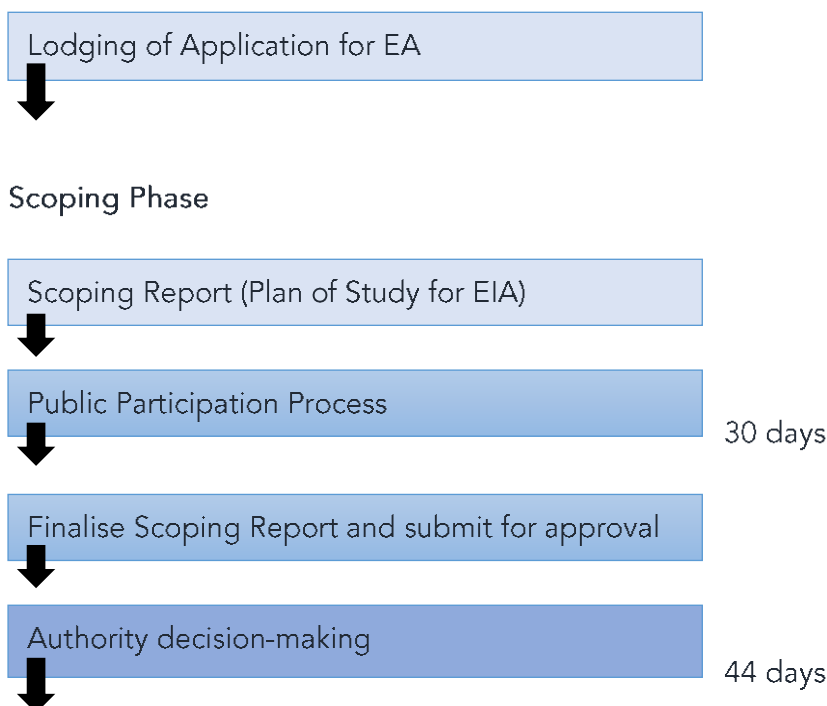


Figure 5.1: The phases of an EIA Process

The National Environmental Management Act (No. 107 of 1998) (NEMA) is South Africa’s key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as “listed activities”. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant EA. Due to the fact that the Mirach Solar PV Project is a power generation facility and therefore relates to the IRP 2010 – 2030, the National Department of Forestry, Fisheries and the Environment (DFFE) has been determined as the Competent Authority in terms of GN.R. 779 of 01 July 2016. The Provincial Limpopo Department of Economic Development, Environment and Tourism (DEDET) is the Commenting Authority on the project.

In terms of the EIA Regulations, 2014 (as amended) the S&EIA process is subject to prescribed timeframes that must be adhered to. These prescribed timeframes must be adhered to otherwise the Application for Environmental Authorisation will lapse and the process will be required to be restarted. Figure 5.2 provides the prescribed timeframes of the S&EIA process underway, including the relevant public participation process timeframes for the collection of comments.



EIA Phase



Figure 5.2: Prescribed timeframes associated with the S&EIA process

The final Scoping Report and Plan of Study for the EIA was submitted to the competent authority for decision-making within 42 days of lodging the Application for Environmental Authorisation (this timeframe includes a 30-day review and comment period of the draft Scoping Report). Acceptance of Scoping was received by the DFFE on 28 August 2023 which includes specific requirements that must be complied within in the EIA Report. The requirements of the Acceptance of Scoping are included in section 5.1 below.

The final EIA Report must be submitted to the competent authority for decision-making on the Application for Environmental Authorisation within 106 days of receipt of the Acceptance of Scoping (this timeframe includes a 30-day review and comment period of the draft EIA Report and Environmental Management Programme (EMPr)).

5.1 Requirements for the EIA Report: DFFE Acceptance of Scoping

The DFFE has accepted the Scoping Report and Plan of study for the EIA and has furthermore provided a list of requirements that needs to be adhered to and complied with as part of the EIA Report. Table 5.1 below provides the requirements that have been set by the Department as well as the responses to where the requirements have been addressed / complied with in this draft EIA Report.

The requirements and responses have also been included in the Comments and Responses Report (Appendix C7).

Table 5.1: Requirements for the EIA Report as per the DFFE Acceptance of Scoping

Requirement	Response / Proof of Compliance
<u>(a) Application form and listed activities</u>	
(i) You have applied for Activity 14 of Listing Notice 1. Please ensure that the project description provided speaks to the relevant listed activity thresholds (e.g., describe the dangerous goods facility and its capacity).	Section 2.2 of this draft EIA Report has been updated to include the details of the relevant activity for the storage and handling of dangerous goods.
(ii) You have applied for activity 28 (ii) "Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 1998 and where such development (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare". You are required to provide the exact total area to be developed for the PV facility and associated infrastructure.	Activity 28(ii) is triggered as the total area to be developed for the PV facility and associated infrastructure is greater than 1 ha and occurs outside an urban area in an area currently zoned for agriculture. The property will be re-zoned to "special" use as per the municipal by-laws. The identified development area is up to 747 ha and will house a development footprint of up to 650 ha. Section 1.2 has been updated and amended Application for Environmental Authorisation has been submitted to the DFFE with the draft EIA Report.
(iii) Please ensure that all relevant listed activities are applied for, are specific, and can be linked to the development activity or infrastructure (including thresholds) as described in the project description. Only activities and sub-listed activities applicable to	Section 1.2 provides the details of all listed activities applied for and provides a description of how the activities are linked to the Mirach Solar PV Project.

<p>the development must be applied for and assessed. When including activities in the application form and draft EIAr, take note of the word OR in between the sub-listed activities</p>	<p>An amended Application for Environmental Authorisation has been submitted to the DFFE with the draft EIA Report.</p>
<p><u>(b) Locality, Site Layout and Sensitivity Maps</u></p> <ul style="list-style-type: none"> • The draft EIAr must provide the following: 	
<ul style="list-style-type: none"> - A clear description of all associated infrastructure. This description must include, but is not limited to the following: <ul style="list-style-type: none"> ➤ Power lines and substation; ➤ Internal road infrastructure; and ➤ All supporting onsite infrastructure such as laydown area and auxiliary buildings, dangerous goods facility, etc. 	<p>A clear description of all associated infrastructure is included in section 2 of the draft EIA Report.</p>
<ul style="list-style-type: none"> - All necessary details regarding all possible locations and sizes of the proposed solar PV infrastructure. 	<p>A clear description of all associated infrastructure and the details thereof is included in section 2 of the draft EIA Report.</p>
<ul style="list-style-type: none"> - A copy of the final preferred layout map. All available biodiversity information must be used in the finalisation of the layout map. Existing infrastructure must be used as far as possible e.g. roads. The layout map must indicate the following: <ul style="list-style-type: none"> ➤ Permanent laydown area footprint; 	<p>The optimised development footprint overlain with the environmental sensitivities are included as Appendix F.</p>

<ul style="list-style-type: none"> ➤ Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements which they serve (to make commenting on sections possible); ➤ Wetlands, drainage lines, rivers, streams, and water crossings of roads and cables indicating the type of bridging structures that will be used; ➤ The location of sensitive environmental features on-site e.g. CBAs, heritage sites, wetlands, drainage lines, etc. that will be affected by the facility and its associated infrastructure; ➤ Substation(s) and/or transformer(s) sites, including their entire footprint; ➤ Location of access and service roads; ➤ Connection routes (including pylon positions) to the distribution/transmission network; ➤ All existing infrastructure on the site, especially railway lines and roads; ➤ Buffer areas; ➤ Buildings, including accommodation; ➤ All "no-go" areas; and ➤ A north arrow and legend/key, to enable the Department to interpret the layout map. 	
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<ul style="list-style-type: none"> - An environmental sensitivity map indicating environmentally sensitive areas and features identified during the assessment process. 	<p>The environmental sensitivity map is included as Figures H 1 and H3.</p>
<ul style="list-style-type: none"> - A map combining the final layout map superimposed (overlain) on the environmental sensitivity map. 	<p>The optimised development footprint overlain with the environmental sensitivities are included as Appendix F.</p>
<ul style="list-style-type: none"> - You stated that no detailed layout was provided to the wetland specialist. The report version will therefore be updated to include an impact (or risk) assessment once a detailed layout is provided. You are required to provide a preliminary site layout plan. 	<p>The development footprint assessed as part of the EIA Phase has been provided to the wetland specialist and has been mapped in the Wetland Baseline and Risk Assessment Report of the draft EIA Report. Refer to Appendix E2.</p>
<p><u>(c) Specific Comments</u></p>	
<p>(i) You have indicated that the project will require battery storage. Please provide the maximum height, volume, and capacity of the BESS and the size of the area to be occupied by the BESS.</p>	<p>The details of the BESS available at this stage of the development is included in section 2 of the draft EIA Report.</p>
<p>(ii) On page 92 of the FSR, it is stated that the location alternative will be considered to determine which location alternative is more feasible from an engineering perspective. Please ensure that a location alternative is also considered for the onsite substation. Furthermore, please explain the differences between the alternatives, as well as why one is preferable over the other.</p>	<p>Refer to section 2.4.5 for the details of the substation location alternatives associated with the Mirach Solar PV Project.</p>

<p>(iii) The draft EIAr must include the four corner coordinate points for the Solar PV, Inverters and transformers, Battery Energy Storage System (BESS), and Onsite IPP substation. Detailed coordinates for the starting, middle, and ending points of the power line, internal and external roads, as well as the length of each road.</p>	<p>The coordinate points associated with the development footprint is included in section 2.2 of this draft EIA Report.</p>
<p><u>(d) Alternatives</u></p>	
<p>(i) Three grid alternatives for the proposed LILO (Loop-In Loop-Out) connection with existing grid infrastructure are being considered. In the draft EIAr, please specify which grid connection is the preferred alternative and why the others are not feasible.</p>	<p>During the Scoping Phase three separate grid connection corridors were proposed to indicate the relevant grid connection points along the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line. However, as the routes overlap and follow the same alignment the Applicant has advised that one grid connection corridor is to be assessed and authorised. This is considered to be the most technically feasible approach in assessing and authorising the grid connection corridor. Therefore, no new routes are proposed, the only change is how the corridor /grid connection points have been packaged within the draft EIA Report.</p>
<p>(ii) Please note that Appendix 1(3)(1)(h)(x) of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, requires that “if no alternatives, including alternative locations for the activity, were investigated, the motivation for not considering such” must be included in the final BAR. You are therefore</p>	<p>The details of all alternatives assessed as part of the draft EIA Report is included in section 2.4.</p>

<p>required to provide a motivation should other alternative sites, routes, layouts, and technologies not be considered.</p>	
<p><u>(e) Public Participation</u></p>	
<p>(i) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAR. This includes but is not limited to the Limpopo Department of Economic Development, Environment and Tourism (LEDET), Waterberg District Municipality, Thabazimbi Local Municipality, and the Department of Environment, Forestry and Fisheries: Directorate Biodiversity and Conservation</p>	<p>All relevant stakeholders have been notified of the 30-day review and comment period of the Mirach Solar PV Project draft EIA Report.</p> <p>All comments received during the 30-day review period will be included in the final EIA Report and submitted to the DFFE as part of the decision-making on the Application for Environmental Authorisation.</p>
<p>(ii) Please ensure that all issues raised, and comments received on the draft SR and draft EIAR from registered I&APs and organs of state which have jurisdiction (including this Department’s Biodiversity Section: BCAdmin@environment.gov.za) in respect of the proposed activity are adequately addressed in the Final SR. Proof of correspondence with the various stakeholders must be included in the Final EIAR. Should you be unable to obtain comments, proof must be submitted to the Department of the attempts that were made to obtain comments.</p>	<p>All comments received on the draft Scoping Report are included in Appendix C of the draft EIA Report. All comments received during the 30-day review period will be included in the final EIA Report and submitted to the DFFE as part of the decision-making on the Application for Environmental Authorisation.</p> <p>The DFFE Biodiversity Section has been notified of the availability of the draft EIA Report for the 30-day review and comment period.</p> <p>Proof of correspondence is included in Appendix C, including attempts made by Blue Crane Environmental to obtain comment.</p>

<p>(iii) A comments and response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments (pre and post-submission of the draft EIAr) received for this development. The C&R report must be a separate document from the main report and the format must be in the table format which reflects the details of the I&APs and date of comments received, actual comments received, and response provided. Please ensure that comments made by I&APs are comprehensively captured (copy verbatim if required) and responded to clearly and thoroughly. Please note that a response such as "Noted" is not regarded as an adequate response to I&APs comments.</p>	<p>A comments and responses report is included as Appendix C7 to the draft EIA Report which includes all comments received during the EIA Phase to date.</p> <p>This is a separate document that has been provided in table format and includes the comments verbatim as well as a detailed response from the project team.</p>
<p>(iv) Please ensure that the EIAr indicates when and where the draft SR and EIAr were made available for a 30-day review and comment period.</p>	<p>Refer to section 6.2 for the details of draft EIA Report 30-day review and comment period.</p>
<p>(v) The Public Participation Process must be conducted in terms of the approved public participation plan and Regulations 39, 40, 41, 42, 43 & 44 of the EIA Regulations 2014, as amended.</p>	<p>The Public Participation Process has been conducted as per the requirements of Chapter 6 of the EIA Regulations, 2014. Refer to section 6 of the draft EIA Report for the details of the Public Participation Process undertaken for the Mirach Solar PV Project.</p>
<p><u>(f) Specialist Assessments</u></p>	
<p>(i) The EAP must ensure that the terms of reference for all the identified specialist studies include the following:</p>	<p>The specialist terms of reference, included in Appendix E9, provides the details of the assessment methodology, the locations and</p>

<ul style="list-style-type: none"> ➤ A detailed description of the study’s methodology; an indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations. ➤ Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. 	<p>descriptions of the development footprint and associated infrastructure.</p> <p>Each respective specialist study also provides further details of the methodologies applied in terms of the field of study under consideration. Refer to Appendix E.</p> <p>Each respective specialist study provides limitations and gaps in knowledge (where relevant) in terms of the field of study under consideration. Refer to Appendix E.</p>
<p>(ii) Please note that the Department considers a ‘no-go’ area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the ‘no-go’ areas.</p>	<p>The definition of ‘no-go’ area of the Department is noted and agreed to.</p>
<p>(iii) Should the specialist definition of a ‘no-go’ area differ from the Department’s definition; this must be clearly indicated. The specialist must also indicate the ‘no-go’ area’s buffer if applicable.</p>	<p>The specialist definition of ‘no-go’ area aligns with the definition of the Department.</p>
<p>(iv) All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred alternative and recommendations, and must not recommend further studies to be completed post EA.</p>	<p>All specialist studies are final and to not include any recommendations which constitute post EA studies.</p>

<p>(v) Should a specialist recommend specific mitigation measures, these must be clearly indicated.</p>	<p>Specific recommendations and mitigation measures identified by the specialists have been included in section 8.1 and the relevant EMPs (Appendix G).</p>
<p>(vi) It is further brought to your attention that Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols"), and in Government Notice No. 1150 of 30 October 2020 (i.e. protocols for terrestrial plant and animal species), have come into effect. <i>Specialist assessments must be conducted in accordance with these protocols. In addition, the protocols require the specialist to be registered with SACNASP.</i></p>	<p>The Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes has been adhered to by the relevant specialists as per the specialist reports included in Appendix E of the draft EIA Report</p> <p>The requirement for the specialists to be registered with SACNASP is noted and has been adhered to accordingly.</p>
<p>(vii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defensible reasons; and where necessary, include further expertise advice.</p>	<p>No contradicting recommendations have been specified by the specialists.</p>

<p>(viii) The department provisionally accepts that the following Specialist Assessments will form part of the EIA, as indicated in the final SR dated July 2023. However, this is subject to change depending on the outcome of the Site Sensitivity Report as indicated in points xi-xiii below</p> <ul style="list-style-type: none"> ➤ Terrestrial Ecological Assessment and Avifauna Impact Assessment ➤ Wetlands and aquatics ➤ Social Impact Assessment ➤ Heritage and palaeontology ➤ Visual Impact Assessment ➤ Soils and agricultural assessment 	<p>It is confirmed that the list of Specialist Assessment have been included as part of the draft EIA Report as follows:</p> <ul style="list-style-type: none"> • Appendix E1: Terrestrial Ecology Baseline and Impact Assessment • Appendix E2: Wetland Baseline and Risk Assessment • Appendix E3: Avifauna Impact Assessment • Appendix E4: Soil and Agricultural Compliance Statement • Appendix E5: Visual Impact Assessment • Appendix E6: Social Impact Assessment • Appendix E7: Heritage Impact Assessment • Appendix E8: Palaeontological Impact Assessment <p>The assessments have been undertaken by the relevant specialists listed by the Department in the Acceptance of Scoping.</p>
<p>(ix) In addition, the protocol states as follows:</p> <p>1.2. <i>The site sensitivity verification must be undertaken through the use of the following:</i></p> <p>(a) <i>a desktop analysis, using satellite imagery;</i></p> <p>(b) <i>a preliminary on-site inspection; and</i></p> <p>(c) <i>any other available and relevant information.</i></p> <p>1.3. <i>The outcome of the site sensitivity verification must be recorded in the form of a report that-</i></p> <p>(a) <i>confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such</i></p>	<p>The requirements of the protocol are noted.</p> <p>An updated site sensitivity verification report has been provided as part of the draft EIA Report and is included in Appendix D.</p>

<p><i>as new developments or infrastructure, the change in vegetation cover or status</i></p> <p><i>(b) contains a motivation and evidence (e.g., photographs) of either the verified or different use of the land and environmental sensitivity; and</i></p> <p><i>(c) is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations (EIA Regulations)."</i></p>	
<p>(X) Please ensure that a site sensitivity report for all the Themes as identified by the Screening Tool Report is submitted with the draft EIAr. The department takes note of the information contained in Table 1.4 of the final SR and Appendix D (Site Sensitivity Verification Report (SSVR)) of the Final SR. However, the information in this table and the SSVR is insufficient and doesn't meet the requirements of the protocols. The SSVR does not indicate nor conclude whether or not the EAP or specialist dispute or confirm the findings of the screening tool. The EAP or Specialist must, for all the themes, categorically state if the findings of the screening tool are being confirmed or disputed. <u><i>The requirement to confirm or dispute the findings does not only apply to the themes with low sensitivity, it applies to all the themes regardless of their rating.</i></u> It is a legal requirement that the EAP or specialist confirm or dispute the findings of the screening tool, as this is the only legal means the department has at its disposal</p>	<p>An updated site sensitivity verification report has been provided as part of the draft EIA Report and is included in Appendix D.</p>

<p>to verify which specialist studies should form part of the detailed assessment.</p>	
<p>(xi) Considering the above, you are required to include, as part of the draft EIAR, a table summarising the themes as per the Screening Tool assessment report and their respective sensitivity ratings (very high, high, medium, low), a column indicating the sensitivity of each theme after the EAP/Specialist conducted the Site Sensitivity Verification Assessment (a dispute or confirmation of the finding by the Screening Tool), and a column indicating whether these studies will be conducted or if a compliance statement will be submitted, or motivation in a case where the proposed development is not located close to any landing strips/Airports, or military bases and their respective buffer areas, as per the requirements of the protocols.</p>	<p>Refer to section 5.2 of the draft EIA Report for the required table.</p>
<p><u>(g) Environmental Management Programme</u></p>	
<p>(i) It is drawn to your attention that for <u>substation and overhead electricity transmission and distribution infrastructure</u>, when such facilities trigger activity 11 or 47 of the EIA Regulations Listing Notice 1 of 2014, as amended, and any other listed and specified activities necessary for the realisation of such facilities, the generic Environmental Management Programmes (EMPr), contemplated in Regulations 19(4) must be used over and above the EMPr for</p>	<p>Three EMPrs are submitted with the draft EIA Report. These include:</p> <ul style="list-style-type: none"> • Appendix G1: Environmental Management Programme for the Mirach Solar PV Project • Appendix G2: Generic Environmental Management Programme for the Overhead Power Line

<p>the PV facility. Accordingly, there needs to be a generic EMPr for the on-site substation, a generic EMPr for the overhead power line, and a third, separate EMPr for the PV facility.</p>	<ul style="list-style-type: none"> • Appendix G3: Generic Environmental Management Programme for the Substation <p>This requirement has therefore been adhered to.</p>
<p>(ii) Please ensure that any specific mitigation measures identified in the EIAR and specialist reports for the on-site substation and power line are incorporated into the site-specific section of the generic EMPrs.</p>	<p>Site specific mitigation measures identified by the independent specialist reports (Appendix E) are included in Appendix G2 and G3, where relevant.</p>
<p>(iii) Please ensure that the mitigation measures specified in the EIAR and specialist reports for the PV facility are also incorporated into the EMPr for the PV facility. In addition, please ensure that the EMPr complies with the content of the EMPr in terms of Appendix 4 of the EIA Regulations, 2014, as amended.</p>	<p>Site specific mitigation measures identified by the independent specialist reports (Appendix E) are included in Appendix G1 as relevant.</p> <p>Appendix G1 complies with the requirements of Appendix 4 of the EIA Regulations, 2014, as amended.</p>
<p>(iv) Please also include in the EMPrs, a recommended frequency for the auditing of compliance with the conditions of the EA and EMPr, and the submission of such compliance reports to the competent authority.</p>	<p>Refer to Appendix G for the requirements in terms of auditing.</p>
<p>(v) Please ensure that the final EIAR includes the period for which the Environmental Authorisation (EA) is required, the date on which the activity will be concluded, and the post-construction</p>	<p>The period for which the environmental authorisation is required is included in section 11.3.</p>

<p>monitoring requirements finalised, as per Appendix 3(3)(1)(r) of the NEMA EIA Regulations, 2014, as amended.</p>	<p>It is however not possible to indicate the date on which the activity will be concluded and the date on which the post construction monitoring requirements finalised as the development is intended to be bid as part of the REIPPP programme.</p>
<p>(vi) Confirmation of the availability of services (e.g., sewage, water, etc. if required) must be included in the EIAR.</p>	<p>Consultation by the Applicant with the relevant service providers is still underway and is therefore not available at the time of the 30-day review and comment period of the draft EIA Report.</p>
<p>The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as an amendment, with regard to the period allowed for complying with the requirements of the Regulations.</p>	<p>The prescribed timeframes as per the EIA Regulations are noted and will be adhered to accordingly.</p>
<p>You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department.</p>	<p>The Applicant acknowledges that no activity may commence prior to an environmental authorisation being granted by the Department.</p>

5.2 Assessment of Potential Impacts and Issues

As part of the EIA Phase independent specialists have been appointed to identify potential environmental impacts and issues that may have a negative impact on the environment, and throughout the assessment process identify and recommend appropriate mitigation and management measures for the reduction of the negative impact significance to appropriate levels.

In terms of GN.R. 960 (promulgated on 05 July 2019) and Regulation 16(1)(b)(v) of the EIA Regulations, 2014, (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulations 21 – 24 of the EIA Regulations. The requirement for the submission of a Screening Report for the Mirach Solar PV Project is applicable as it triggers Regulation 22 of the EIA Regulations, 2014 (as amended).

Table 5.2, 5.3 and 5.4 included below provides an indication of the specialist studies identified by the DFFE Screening Tool Reports (STR) (Appendix B) within the different applicable categories, an indication of whether the studies were undertaken or not and a motivation or confirmation of the studies being included or not. Furthermore, an indication is provided whether the findings of the Screening Tool Report is confirmed or disputed.

Kindly refer to the Site Verification Report included under Appendix D of this draft EIA Report. The site verification report further details reasons for exclusion of specialist studies where applicable.

Table 5.2: Specialist studies Identified by the DFFE screening tool, solar PV category

Theme and Sensitivity	Study Undertaken	Comment / Motivation
Agricultural Impact Assessment Sensitivity: High	Yes	<p>Feature(s): Land capability; 09. Moderate-High/10. Moderate-High. Annual Crop Cultivation / Planted Pastures Rotation; Land capability; 09. Moderate-High/10. Moderate-High. Annual Crop Cultivation / Planted Pastures Rotation; Land capability; 06. Low-Moderate/07. Low-Moderate/08. Moderate.</p> <p>The rating of a high sensitivity has been disputed by the specialist and has been confirmed as a medium sensitivity based on the verified baseline findings.</p> <p>A Soil and Agricultural Compliance Statement is included as Appendix E4 of this draft EIA Report as per the confirmed medium sensitivity.</p>
Animal Species Assessment Sensitivity: Medium	Yes	<p>Feature(s): Presence of sensitive animal species i.e., <i>Aves-Aquila rapax</i>, <i>Sensitive species 5</i>, <i>Mammalia-Dasymys robertsii</i>, <i>Mammalia-Lycaon pictus</i> and <i>Reptilia-Crocodylus niloticus</i>.</p> <p>The rating of a medium sensitivity has been confirmed by the specialist based on the validated results which indicated that the habitat is generally intact and Species of Conservation Concern could possibly be present and may forage in specific areas.</p> <p>A Terrestrial Ecology Baseline and Impact Assessment is included as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.</p>

<p>Aquatic Biodiversity Impact Assessment</p> <p>Sensitivity: Very High</p>	<p>Yes</p>	<p>Feature(s): Wetlands and Estuaries.</p> <p>During the site assessment, two HGM units were identified and assessed within the project area of influence. These comprise of two different depression wetlands. The wetlands scored an overall PES scores ranging from D – “Largely Modified” to E “Critically Modified” due to the modification to both the hydrology and vegetation of the wetlands through anthropogenic activities. The wetlands scored “Low” importance and sensitivity scores due to the low protection level of both the wetland vegetation and units. The average ecosystem service score was determined to range between “Intermediate” and “Moderately High”. The rating of very high sensitivity for the site is therefore disputed by the specialist.</p> <p>A Wetland Baseline and Risk Assessment is included as Appendix E2 of this draft EIA Report.</p>
<p>Archaeological and Cultural Heritage Impact Assessment</p> <p>Sensitivity: Low</p>	<p>Yes</p>	<p>The rating of a low sensitivity has been confirmed by the specialist based on the validated results that indicate during the survey no sites, features or objects of cultural significance were identified.</p> <p>Heritage Impact Assessment is included as Appendix E7 of this draft EIA Report. The Heritage Impact Assessment has been undertaken as per the requirements of the National Heritage Resources Act.</p>
<p>Avian Impact Assessment</p> <p>Sensitivity: Very High</p>	<p>Yes</p>	<p>Feature(s): within 50 km of colonies</p> <p>The rating of very high sensitivity has been confirmed by the specialist based on the validated results that indicate that the habitat is altered but has the potential to house Species of Conservation Concern.</p> <p>An Avifauna Impact Assessment is included in Appendix E3 of this draft EIA Report.</p>

<p>Civil Aviation Assessment</p> <p>Sensitivity: Low</p>	<p>No</p>	<p>Feature(s): No major or other types of civil aviation aerodromes have been identified.</p> <p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no major or other types of civil aviation aerodromes are present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project.</p>
<p>Defence Theme</p> <p>Sensitivity: Low</p>	<p>No</p>	<p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no defence infrastructure is present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date regarding the project.</p>
<p>Landscape / Visual Impact Assessment</p> <p>Sensitivity: Very High</p>	<p>Yes</p>	<p>Feature(s): Within 1.5 km from a nature reserve.</p> <p>The specialist has confirmed that the area surrounding the development is low in development and features cattle and game farming. The proposed development is also situated in a serene Bushveld setting that is renowned for its tranquillity. The area is a popular destination for tourists who are drawn to hunting and the complete safari experience. Additionally, the region also attracts international hunters seeking an authentic African hunting experience. Although the project is in close proximity to private nature reserves, these reserves are mainly used for hunting and livestock farming. The potential degradation of the</p>

		<p>landscape is partially protected by existing screening, although its effectiveness has not been assessed. The Bushveld area is renowned for its abundant tree cover, and the area surrounding the proposed development is no exception. The copious number of trees present in the region will provide exceptional screening, significantly reducing the visual impact.</p> <p>As visual impact is a subjective perspective in terms of the viewer, a Visual Impact Assessment has been undertaken and is included as Appendix E5 of this draft EIA Report.</p>
<p>Palaeontological Impact Assessment</p> <p>Sensitivity: Medium</p>	<p>Yes</p>	<p>Feature(s): Features with a medium palaeontological sensitivity.</p> <p>The specialist has confirmed that the site is of low sensitivity based on the updated and refined geological map and indicates that the proposed development is underlain by alluvium, colluvium, elluvium and gravel as well as diabase and the Aasvoëlkop Formation of the Matlabas Subgroup (Waterberg Group). The rating of medium sensitivity is therefore disputed.</p> <p>The Palaeontological Desktop Assessment is included as Appendix E8 of this draft EIA Report. The Palaeontological Desktop Assessment has been undertaken as per the requirements of the National Heritage Resources Act.</p>
<p>Plant species Assessment</p> <p>Sensitivity: Low</p>	<p>Yes</p>	<p>The rating of a low sensitivity has been confirmed by the specialist based on the validated results which considered composition, moderate species diversity and number of plant species recorded, including the protected species recorded.</p>

		A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.
RFI Assessment Sensitivity: Low	No	<p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no RFI infrastructure is present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The South African Radio Astronomy Observatory (SARAO) and the South African Weather Service has been consulted regarding the development of the project. No specific negative impacts or issues have been raised to date by the SARAO or the South African Weather Service regarding the project.</p>
Terrestrial Biodiversity Impact Assessment Sensitivity: Very High	Yes	<p>Feature(s): Critical Biodiversity Area 2 and presence of Private Nature Reserves adjacent to the project.</p> <p>The rating of very high sensitivity has been disputed by the specialist and is confirmed to be of a high sensitivity. This is based on the validated results which indicate that certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area. Medium and Low sensitive areas were also delineated.</p> <p>A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.</p>
Geotechnical Assessment Sensitivity: Not indicated	No	The detailed Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout. The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern.

Socio-Economic Assessment	Yes	A Social Impact Assessment is included in Appendix E6.
Sensitivity:	Not indicated	

Table 5.3: Specialist studies identified by the DFFE screening tool, substation category

Theme and Sensitivity	Study Undertaken	Comment / Motivation
Agricultural Impact Assessment Sensitivity: High	Yes	<p>Feature(s): Land capability; 09. Moderate-High/10. Moderate-High. Annual Crop Cultivation / Planted Pastures Rotation; Land capability; 09. Moderate-High/10. Moderate-High. Annual Crop Cultivation / Planted Pastures Rotation; Land capability; 06. Low-Moderate/07. Low-Moderate/08. Moderate.</p> <p>The rating of a high sensitivity has been disputed by the specialist and has been confirmed as a medium sensitivity based on the verified baseline findings.</p> <p>A Soil and Agricultural Compliance Statement is included as Appendix E4 of this draft EIA Report as per the confirmed medium sensitivity.</p>
Animal Species Assessment	Yes	<p>Feature(s): Presence of sensitive animal species i.e., <i>Aves-Aquila rapax</i>, <i>Sensitive species 5</i>, <i>Mammalia-Dasymys robertsii</i>, <i>Mammalia-Lycaon pictus</i> and <i>Reptilia-Crocodylus niloticus</i>.</p>

<p>Sensitivity: Medium</p>		<p>The rating of a medium sensitivity has been confirmed by the specialist based on the validated results which indicated that the habitat is generally intact and Species of Conservation Concern could possibly be present and may forage in specific areas.</p> <p>A Terrestrial Ecology Baseline and Impact Assessment is included as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.</p>
<p>Aquatic Biodiversity Impact Assessment Sensitivity: Very High</p>	<p>Yes</p>	<p>Feature(s): Wetlands and Estuaries.</p> <p>During the site assessment, two HGM units were identified and assessed within the project area of influence. These comprise of two different depression wetlands. The wetlands scored an overall PES scores ranging from D – “Largely Modified” to E “Critically Modified” due to the modification to both the hydrology and vegetation of the wetlands through anthropogenic activities. The wetlands scored “Low” importance and sensitivity scores due to the low protection level of both the wetland vegetation and units. The average ecosystem service score was determined to range between “Intermediate” and “Moderately High”. The rating of very high sensitivity for the site is therefore disputed by the specialist.</p> <p>A Wetland Baseline and Risk Assessment is included as Appendix E2 of this draft EIA Report.</p>
<p>Archaeological and Cultural Heritage Impact Assessment</p>	<p>Yes</p>	<p>The rating of a low sensitivity has been confirmed by the specialist based on the validated results that indicate during the survey no sites, features or objects of cultural significance were identified.</p> <p>Heritage Impact Assessment is included as Appendix E7 of this draft EIA Report. The Heritage Impact Assessment has been undertaken as per the requirements of the National Heritage Resources Act.</p>

Sensitivity: Low		
Civil Aviation Assessment Sensitivity: Low	No	<p>Feature(s): No major or other types of civil aviation aerodromes have been identified.</p> <p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no major or other types of civil aviation aerodromes are present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project.</p>
Defence Theme Sensitivity: Low	No	<p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no defence infrastructure is present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date regarding the project.</p>
Palaeontological Impact Assessment Sensitivity: Medium	Yes	<p>Feature(s): Features with a medium palaeontological sensitivity.</p> <p>The specialist has confirmed that the site is of low sensitivity based on the updated and refined geological map and indicates that the proposed development is underlain by alluvium, colluvium, elluvium and gravel as well as diabase and the Aasvoëlkop Formation of the Matlabas Subgroup (Waterberg Group). The rating of medium sensitivity is therefore disputed.</p>

		The Palaeontological Desktop Assessment is included as Appendix E8 of this draft EIA Report. The Palaeontological Desktop Assessment has been undertaken as per the requirements of the National Heritage Resources Act.
Plant species Assessment Sensitivity: Low	Yes	The rating of a low sensitivity has been confirmed by the specialist based on the validated results which considered composition, moderate species diversity and number of plant species recorded, including the protected species recorded. A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.
Terrestrial Biodiversity Impact Assessment Sensitivity: Very High	Yes	Feature(s): Critical Biodiversity Area 2 and presence of Private Nature Reserves adjacent to the project. The rating of very high sensitivity has been disputed by the specialist and is confirmed to be of a high sensitivity. This is based on the validated results which indicate that certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area. Medium and Low sensitive areas were also delineated. A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.
Geotechnical Assessment	No	The detailed Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout. The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern.

Sensitivity: Not indicated		
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Table 5.4: Specialist studies identified by the DFFE screening tool, power line category (LILCO Connection)

Theme and Sensitivity	Study Undertaken	Comment / Motivation
Agricultural Impact Assessment Sensitivity: High	Yes	<p>Feature(s): Land capability; 09. Moderate-High/10. Moderate-High.</p> <p>The rating of a high sensitivity has been disputed by the specialist and has been confirmed as a medium sensitivity based on the verified baseline findings.</p> <p>A Soil and Agricultural Compliance Statement is included as Appendix E4 of this draft EIA Report as per the confirmed medium sensitivity.</p>
Animal Species Assessment Sensitivity: High	Yes	<p>Feature(s): Presence of sensitive animal species i.e., <i>Aves-Aquila rapax</i>, <i>Sensitive species 5</i>, <i>Mammalia-Dasymys robertsii</i>, <i>Mammalia-Lycaon pictus</i> and <i>Reptilia-Crocodylus niloticus</i>.</p> <p>The rating of a medium sensitivity has been confirmed by the specialist based on the validated results which indicated that the habitat is generally intact and Species of Conservation Concern could possibly be present and may forage in specific areas. The rating of high sensitivity is therefore disputed by the specialist.</p>

		<p>A Terrestrial Ecology Baseline and Impact Assessment is included as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.</p>
<p>Aquatic Biodiversity Impact Assessment</p> <p>Sensitivity: Very High</p>	<p>Yes</p>	<p>Feature(s): Wetlands, Central Bushveld Region.</p> <p>During the site assessment, two HGM units were identified and assessed within the project area of influence. These comprise of two different depression wetlands. The wetlands scored an overall PES scores ranging from D – “Largely Modified” to E “Critically Modified” due to the modification to both the hydrology and vegetation of the wetlands through anthropogenic activities. The wetlands scored “Low” importance and sensitivity scores due to the low protection level of both the wetland vegetation and units. The average ecosystem service score was determined to range between “Intermediate” and “Moderately High”. The rating of very high sensitivity for the site is therefore disputed by the specialist.</p> <p>The careful placement of the power line route within the grid connection corridor to achieve avoidance of the wetland feature will reduce the sensitivity from very high to low.</p> <p>A Wetland Baseline and Risk Assessment is included as Appendix E2 of this draft EIA Report.</p>
<p>Archaeological and Cultural Heritage Impact Assessment</p> <p>Sensitivity: Low</p>	<p>Yes</p>	<p>The rating of a low sensitivity has been confirmed by the specialist based on the validated results that indicate during the survey no sites, features or objects of cultural significance were identified.</p> <p>Heritage Impact Assessment is included as Appendix E7 of this draft EIA Report. The Heritage Impact Assessment has been undertaken as per the requirements of the National Heritage Resources Act.</p>

<p>Civil Aviation Assessment</p> <p>Sensitivity: Low</p>	<p>No</p>	<p>Feature(s): No major or other types of civil aviation aerodromes have been identified.</p> <p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no major or other types of civil aviation aerodromes are present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project.</p>
<p>Defence Theme</p> <p>Sensitivity: Low</p>	<p>No</p>	<p>During the site visit conducted by the EAP on 23 February 2023 it was confirmed that no defence infrastructure is present and therefore the low sensitivity rating has been confirmed by the EAP.</p> <p>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the EIA Process. No specific negative impacts or issues have been raised to date regarding the project.</p>
<p>Palaeontological Impact Assessment</p> <p>Sensitivity: Medium</p>	<p>Yes</p>	<p>Feature(s): Features with a medium palaeontological sensitivity.</p> <p>The specialist has confirmed that the site is of low sensitivity based on the updated and refined geological map and indicates that the proposed development is underlain by alluvium, colluvium, elluvium and gravel as well as diabase and the Aasvoëlkop Formation of the Matlabas Subgroup (Waterberg Group). The rating of medium sensitivity is therefore disputed.</p>

		The Palaeontological Desktop Assessment is included as Appendix E8 of this draft EIA Report. The Palaeontological Desktop Assessment has been undertaken as per the requirements of the National Heritage Resources Act.
Plant species Assessment Sensitivity: Low	Yes	The rating of a low sensitivity has been confirmed by the specialist based on the validated results which considered composition, moderate species diversity and number of plant species recorded, including the protected species recorded. A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.
Terrestrial Biodiversity Impact Assessment Sensitivity: Very High	Yes	Feature(s): Critical Biodiversity Area 2 and presence of Private Nature Reserves adjacent to the project. The rating of very high sensitivity has been disputed by the specialist and is confirmed to be of a high sensitivity. This is based on the validated results which indicate that certain habitat sensitivities are regarded as high sensitivity due to the role of this intact habitat to biodiversity within an area. Medium and Low sensitive areas were also delineated. A Terrestrial Ecology Baseline and Impact Assessment as Appendix E1 of this draft EIA Report. The Terrestrial study assessed both fauna and flora species.
Geotechnical Assessment	No	The detailed Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout. The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern.

Sensitivity: Not indicated		
Socio-Economic Assessment Sensitivity: Not indicated	Yes	A Social Impact Assessment is included in Appendix E6.

5.3 Impact Assessment Methodology

The environmental impacts assessment aims to identify the various possible environmental impacts that could result from the proposed activity. Different impacts need to be evaluated in terms of its significance and in doing so highlight the most critical issues to be addressed. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Impact assessment must take account of the nature, scale, and duration of impacts on the environment whether such impacts are positive or negative. Each impact is also assessed according to the project phases:

- planning
- construction
- operation
- decommissioning

Table 5.5 provides the impact rating system applied in this draft EIA Report for both direct and cumulative impacts.

Table 5.5: Impact rating methodology

NATURE		
Include a brief description of the impact of the environmental parameter being assessed in the context of the project. This criterion includes a brief written statement of the environmental aspect being impacted by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be experienced.		
1	Site	The impact will only affect the site.
2	Local/district	Will affect the local area or district.
3	Province/region	Will affect the entire province or region.
4	International and National	Will affect the entire country.

PROBABILITY		
This describes the chance of occurrence of an impact.		
1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
DURATION		
This describes the duration of the impacts. Duration indicates the lifetime of the impact as a result of the proposed activity.		
1	Short term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase (0 – 1 years), or the impact will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter (10 – 30 years).

4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered indefinite.
INTENSITY/ MAGNITUDE		
Describes the severity of an impact.		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component, and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired. Rehabilitation and remediation often impossible. If possible, rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
REVERSIBILITY		

<p>This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.</p>		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures.
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible, and no mitigation measures exist.
<p>IRREPLACEABLE LOSS OF RESOURCES</p>		
<p>This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.</p>		
1	No loss of resource	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
<p>CUMULATIVE EFFECT</p>		
<p>This describes the cumulative effect of the impacts. A cumulative impact is an effect which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.</p>		

1	Negligible cumulative impact	The impact would result in negligible to no cumulative effects.
2	Low cumulative impact	The impact would result in insignificant cumulative effects.
3	Medium cumulative impact	The impact would result in minor cumulative effects.
4	High cumulative impact	The impact would result in significant cumulative effects
SIGNIFICANCE		
<p>Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The calculation of the significance of an impact uses the following formula: (Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.</p> <p>The summation of the different criteria will produce a non-weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.</p>		
Points	Impact significance rating	Description
6 to 28	Negative low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.

29 to 50	Positive medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative high impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive high impact	The anticipated impact will have significant positive effects.
74 to 96	Negative very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive very high impact	The anticipated impact will have highly significant positive effects.

The impacts that may be realised with the development of the Mirach Solar PV Project has are assessed in Sections 8 and 9 of this draft EIA Report. An impact assessment is provided of the potential impacts.

5.4 Legal Requirements Complied with in Section 5 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (vi) the methodology used in determining and	Section 5 of this draft EIA Report provides the process followed in terms of the S&EIA process and also provides the details of the methodology used to assess the potential impacts and the significance thereof. See section 5.3.

<p>ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks.</p>	
<p>3(1)(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity.</p>	<p>Section 5 of this draft EIA Report provides the process followed in terms of the S&EIA process and also provides the details of the methodology used to assess the potential impacts and the significance thereof. See section 5.3.</p>

6 PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) has been undertaken in accordance with the requirements of Chapter 6, Regulations 39 to 44 of the 2014 EIA Regulations, as amended (GN.R. 326). The availability and sharing of information provides the foundation of the public participation process, which includes creating opportunities for interested and/or affected parties (I&APs) to become actively involved from the commencement of the S&EIA process.

Variables of a development provide an indication of the level of public participation that would be required. The variables considered include:

- The scale / extent of the potential impacts;
- The sensitivity and vulnerability of the affected environment, and its social aspects and the degree to which the project may create controversy; and
- The characteristics and current conditions of the affected parties.

The sections below provide an indication of the tasks which have been completed for the public participation process and the applicable regulation(s) in the EIA Regulations (as amended), that are complied with.

It must be noted that the Application for Environmental Authorisation and Scoping Phase for the Mirach Solar PV Project was completed by Environamics Environmental Consultants. It must therefore be noted that some documentation providing proof of notification or correspondence will not be on the Blue Crane Environmental documentation templates but on the Environamics templates. The information is included to provide proof of compliance in terms of the requirements for the Public Participation process as per the EIA Regulations.

6.1 Identification of Stakeholder and Interested and / or Affected Parties

The identification of potentially affected stakeholders and I&APs has been undertaken through a process of networking and referral, obtaining information from existing stakeholder databases, liaison with potentially affected parties in the greater study area and a registration process involving the placement of the site notices on the affected properties and the publishing of an advert in a local newspaper. Furthermore, previous project experience in the Limpopo area has also contributed towards the identification of the potential I&APs for the Mirach Solar PV Project.

Key stakeholders and affected and surrounding landowners have been identified and automatically registered on the project database. Other stakeholders are required to formally register their interest in the project.

All relevant stakeholder and I&AP information has been recorded within a register of I&APs, as per the requirements of Regulation 42 of the EIA Regulations, 2014 (as amended). Refer to Appendix C4 for the list of registered I&APs (available only to the competent authority in terms of the POPI Act).

The identification and registration of I&APs will be an on-going process for the duration of the S&EIA Process. The database of I&APs will be updated throughout the process and will act as a record of the I&APs involved in the public participation process.

In terms of the EIA Regulations the following has been complied with:

42 A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –

(a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;

(b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and

(c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

6.2 Formal Notification

The EIA process was announced through the submission of an invitation/notification to the Organs of State, potentially affected and neighbouring landowners and general public to register as I&APs, and thereby obtain access to all project related information. The tasks below were undertaken and completed by Environamics Environmental Consultants and proof thereof are included as Appendix C to this draft EIA Report.

- Compilation of a background information document (BID) providing technical and environmental details on the development and how to become involved in the EIA

process. The BID was distributed to identified stakeholders and I&APs (including surrounding and affected landowners) on 26 April 2023. Refer to Figure 6.1 which provides a map of the affected and adjacent landowners to the site under assessment.

- Placement of site notices announcing the EIA process at visible points along the boundary of the site, in accordance with the requirements of the EIA Regulations. Photographs and the GPS co-ordinates of the site notices are contained in Appendix C3. The site notices were placed on 08 March 2023 in Sesotho, English and Afrikaans.
- Placement of an advertisement in English announcing the EIA process for the project and inviting members of the public to register themselves as I&APs on the project database in the Platinum Bushvelder Newspaper on 21 April 2023. The tear sheet of the newspaper advert is contained in Appendix C2.
- Identified I&APs, including key stakeholders representing various sectors, were directly informed of the EIA process on 26 April 2023 via registered post, telephone calls, WhatsApp and emails (as relevant). The BID was distributed with the notification. It was expected from I&APs to provide their inputs and comments by 29 May 2023.
- The draft Scoping Report was made available to all I&APs via courier, Dropbox and/or email (as relevant) for a 30-day review and comment period from **08 June 2023 to 10 July 2023**.
- The final Scoping Report was submitted to the DFFE for decision-making on **13 July 2023**.

Following the appointment of Blue Crane Environmental as the EAP for the completion of the EIA Phase the following tasks have been completed:

- The relevant official of the competent authority (DFFE) was notified of the change of EAP via email on 04 September 2023. Proof of correspondence is included in Appendix C5.
- All registered I&APs were notified via email on 06 September 2023 of the change of EAP for the Application for EA. The contact details for the submission of queries or comments were also shared with the I&APs to enable future correspondence. Proof of correspondence is included in Appendix C5.
- The draft EIA Report has been made available to all I&APs via courier, Dropbox and/or email (as relevant) for a 30-day review and comment period from **10 October 2023 to 09 November 2023**. Hard copies of the report will be made available on request and where an I&AP does not have the resources to view the report on an online platform. Furthermore, the draft EIA Report has been uploaded to the Blue Crane Environmental website (<https://www.bcrane.co.za/public->

documents/) which enables any party from the public to automatically register on the project database and gain access to the draft EIA Report.

I&AP's and organs of state have been requested to provide their comments on the report in writing by 24 October 2023. All comments submitted during the 30-day review and comment period will be documented and compiled into a Comments and Response Report to be included as part of the Final EIA Report for decision-making on the Application for Environmental Authorisation.

- A Public Meeting will be scheduled for the Mirach Solar PV Project to be held during the 30-day review and comment period. The Public Meeting will be advertised in the Platinum Bushvelder Newspaper prior to the Meeting to invite the public to the Meeting and also provide the details of where and when the meeting will be held. All registered I&APs will also be invited to the Public Meeting via email. Proof of all correspondence and meeting notes will be submitted with the final EIA Report to the DFFE for decision-making on the Application for Environmental authorisation.

In terms of the EIA Regulations the following has been complied with:

- 41.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –
- (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and
 - (ii) Any alternative site.
- 41.(2)(b) Giving written notice, in any of the manners provided for in section 47D of the Act, to –
- (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
 - (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;

- (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
 - (iv) The municipality which has jurisdiction in the area;
 - (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
 - (vi) Any other party as required by the competent authority.
- 41.(2)(c) Placing an advertisement in –
- (i) One local newspaper; or
 - (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- 41.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
- 41.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –
- (i) Illiteracy;
 - (ii) Disability; or
 - (iii) Any other disadvantage.

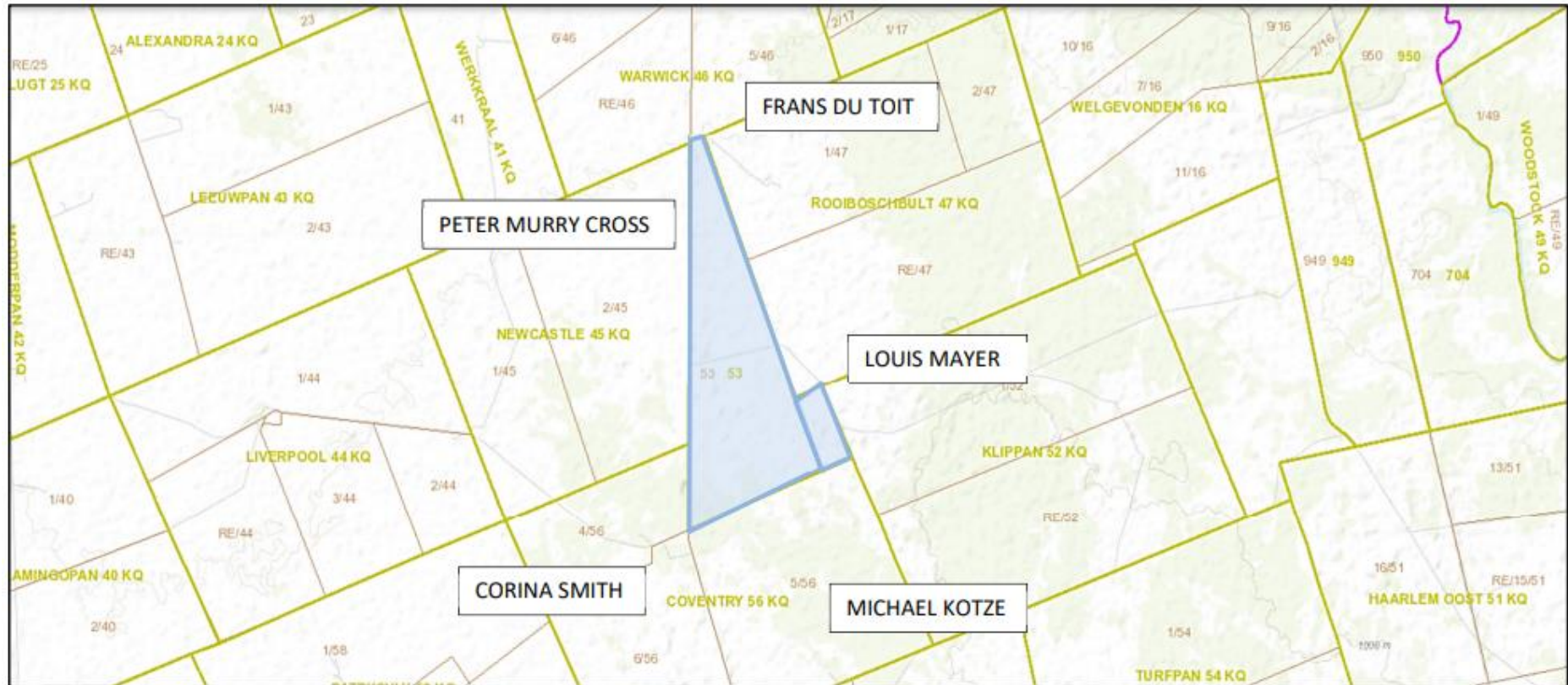


Figure 6.1: Mirach Solar PV Project (indicated in Blue) in relation to the Identified Surrounding Landowners (Source: Environamics, 2023)

6.3 Registered I&APs Entitled to Comment on the Reports and Plans

All registered I&APs on the database (Appendix C4) have been notified, as appropriate, of the availability of the draft EIA Report for a 30-day review and comment period. The I&APs have been invited to comment on the draft EIA Report within the stipulated 30-day timeframe (from 10 October 2023 to 09 November 2023). The notification has been distributed to the I&APs on 10 October 2023.

Proof of notification and correspondence is included in Appendix C5.

All written comments received following notification of the S&EIA process and during the Scoping Phase have been included in the comments and responses report as part of this draft EIA Report as Appendix C7.

All written comments received during the 30-day review and comment period of the draft EIA Report will be recorded, included and addressed in the comments and responses report to be submitted to the DFFE with the final EIA Report for decision-making.

The C&R Report includes detailed responses from members of the EIA project team and/or Applicant to the issues and comments raised during the public participation process.

The C&R report will consist of written comments and issues received:

- on the notification of the EIA process;
- per e-mail, fax or telephonically; and
- during the 30-day review of the draft EIA Report.

In terms of the EIA Regulations the following has been complied with:

43. (1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which that party believes may be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44. (1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.
- (2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –
- (a) A lack of skills to read or write;
 - (b) Disability; or
 - (c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

6.4 Summary of Key Issues raised by I&APs

The following key issues were raised during the Scoping Phase which have been considered, assessed and addressed as part of the draft EIA Report through the recommendation of appropriate management and mitigation measures. Refer to Appendix C for the original comments.

Key Issue	Response
<p>Raised by Matlabas Custodians:</p> <ul style="list-style-type: none"> • Noise and nuisance disturbances • Reduction and disturbance in the “farm atmosphere” • Loss of attraction to eco-tourism for visitors and guests which will impact employment opportunities • Change in natural serenity impacting investments, the regional bio-physical environment and socio-economic environment • Impacts on various businesses need to be considered 	<p>The comments raised by the Stakeholder are noted. From the key issues raised it is noted that the issues mainly relate to the visual, social, terrestrial, aquatic and avifauna aspects of the site.</p> <p>It is confirmed that ground-truthed independent specialist studies have been undertaken as part of the EIA Phase which considers and assesses impacts associated with the visual, social, terrestrial, aquatic and avifauna aspects of the site. These studies</p>

<ul style="list-style-type: none"> • High impacts to the pristine area must be assessed and addressed including avifauna, aquatic, agriculture, landscape, terrestrial biodiversity • Alternative sites must be considered in the EIA Phase so that impacts are properly considered • Various Private Nature Reserves are present within the surrounding area • Visual impact is a major impacts and therefore a Viewshed Analysis must be undertaken • Availability of adequate water for the development without impact on the existing water use • Impact on wetland present which requires an offset • Impact of traffic on stressed road network and road surfaces • Displacement of temporary construction workers leading to negative socio-economic issues such as unemployment and crime 	<p>are included in Appendix E of this draft EIA Report.</p> <p>Furthermore, a formal response letter to provide feedback on the concerns raised will be submitted to the I&AP via email during the 30-day review and comment period of the draft EIA Report to provide detailed feedback on the issues raised. The response letter and proof of correspondence with the I&AP will be included in the final EIA Report.</p>
<p>Raised by an Adjacent Landowner (Mr. Kotze):</p> <ul style="list-style-type: none"> • Current operations (upmarket hunting, breakaway for nature lovers and overseas guests) are linked to the sense of place • Open views to the Kransberg and development might change the view in terms of light pollution at night and change in sense of place • Noise pollution during the construction phase • Economic loss to operations and impact on ability to create employment and 	<p>The comments raised by the Stakeholder are noted. From the key issues raised it is noted that the issues mainly relate to the visual, social and terrestrial aspects of the site.</p> <p>It is confirmed that ground-truthed independent specialist studies have been undertaken as part of the EIA Phase which considers and assesses impacts associated with the visual, social and terrestrial aspects of the site. These studies are included in Appendix E of this draft EIA Report.</p>

<p>ability to care for wildlife (on-going winter breeding programme)</p> <ul style="list-style-type: none"> • Reduction in wildlife and impact on hunting operation that attracts domestic and international guests • Water for both development and ongoing running and maintenance of the operation would have to come from underground water, which is limited at best of times • Additional requirements from the facility will put strain on the underground water levels which in turn would impact my current ability to utilise borehole water • The indication that water can be sourced from Municipal water is unrealistic and far-fetched • Influx of people and change in the dynamics of people • Safety and security concerns • Impact on roads and accessibility issues during the wet season • Upkeep of border and border fencing (buffalo farming and hunting operation) • Impact of lighting pollution on attraction and stargazing for local and international guests • Noise pollution impact during construction on eco-friendly destination and animal wildlife 	<p>Furthermore, a formal response letter to provide feedback on the concerns raised will be submitted to the I&AP via email during the 30-day review and comment period of the draft EIA Report to provide detailed feedback on the issues raised. The response letter and proof of correspondence with the I&AP will be included in the final EIA Report.</p>
<p>Raised by an Adjacent Landowner (Mr. Du Toit):</p> <ul style="list-style-type: none"> • Damage to dirt road due to increased traffic • Security concerns and increase in crime due to influx of people • Forestation of protected bushveld trees 	<p>The comments raised by the Stakeholder are noted. From the key issues raised it is noted that the issues mainly relate to the visual, social and terrestrial aspects of the site.</p>

<ul style="list-style-type: none"> Recommendation to screen the facility and buildings from the passing road. 	<p>It is confirmed that ground-truthed independent specialist studies have been undertaken as part of the EIA Phase which considers and assesses impacts associated with the visual, social and terrestrial aspects of the site. These studies are included in Appendix E of this draft EIA Report.</p>
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6.5 Legal Requirements Complied with in Section 6 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
<p>3(1)(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.</p>	<p>The public participation process, that has been undertaken in terms of Regulation 41 of the EIA Regulations, is fully described and included in Section 6. Proof of all correspondence and proof of the public participation tasks completed is included in Appendix C of this draft EIA Report.</p>
<p>3(1)(h)(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</p>	<p>A summary of the issues raised by I&APs during the 30-day review and comment period of this draft EIA Report will be included in the final EIA Report to be submitted to the DFFE for decision-making.</p> <p>A summary of the key issues raised during the Scoping Phase is included in section 6.4.</p>

7 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The following sections provide general information on the biophysical and socio-economic attributes associated with the preferred alternative (i.e., the location of the development area within the affected property). The information provided below aims to assist the reader in understanding the receiving environment within which the project is proposed. This chapter was supplemented by research of existing available information; information gathered from on-site investigations and as received from various specialist investigations. Refer to Table 1.2 for a list of specialists that were consulted for the proposed Mirach Solar PV Project. All specialist studies are included in Appendix E.

7.1 Description of the Study Area

As presented in the Social Impact Assessment (Appendix E6), the proposed Mirach Solar PV Project is located within the Limpopo Province.

Limpopo Province

The Limpopo Province is located in the northernmost part of South Africa bordering Mozambique, Zimbabwe and Botswana. It is flanked by three South African provinces: the North West Province to the south-west, and Gauteng and Mpumalanga to the south. The Limpopo Province is named after the Limpopo River, which flows along its northern border, separating South Africa from Zimbabwe and Mozambique.

Covering an expansive area of 125 754 km² and home to a population of 5 799 090 people, the Limpopo Province ranks as the fifth largest province in South Africa in terms of both size and population. Its capital and largest city is Polokwane (formerly known as Pietersburg), centrally located within the province. Other significant towns and cities, such as Bela-Bela (Warmbad), Lephalale (Ellisras), Makhado (Louis Trichardt), Musina (Messina), Thabazimbi, and Tzaneen, are scattered throughout the province.

Geographically, the Limpopo Province comprises Lowveld plains interspersed with several mountain ranges that emerge from the Highveld plateau in the southern and central regions. These ranges include the Soutpans Mountains stretching from east to west, as well as the

Water Mountains in the southwest. The Lowveld spans the eastern, northern, and western parts of the province, adorned with iconic mopani and baobab trees that define its unique landscape.

Within the eastern region lies the untouched splendour of the majestic Kruger National Park. Established in 1926, it was South Africa's first national park and has since become one of the country's most popular tourist destinations. The region's abundant wildlife diversity also contributes to a thriving hunting industry, adding to the province's allure as a tourist hotspot.

The province's economic activity is primarily driven by its rich mineral deposits, which include platinum-group metals, iron ore, chromium, high and middle-grade coking coal, diamonds, antimony, phosphate, copper, gold, emeralds, scheelite, magnetite, vermiculite, silicon, and mica. Additionally, agricultural pursuits thrive in certain climatic regions, allowing for double harvesting seasons. As a result, the province boasts the largest production of various crops, including sunflowers, cotton, maize, peanuts in the Bela-Bela and Modimolle region, as well as bananas, litchis, pineapples, mangoes, pawpaw's, and various nuts in the Tzaneen and Makhado region. Coffee and tea plantations in the province also provide numerous employment opportunities for the local population.

The Limpopo Province serves as a vital cross-border transportation route from South Africa to other southern African countries. The N1 national route connects Cape Town to Musina in the northern part of South Africa before crossing over to Zimbabwe at the Beit Bridge border over the Limpopo River. In Zimbabwe, the road continues as the A4 and connects South Africa to Harare, the capital of Zimbabwe.

Administratively, the Limpopo Province is divided into five district municipalities, which are further subdivided into 22 local municipalities. Refer to Figure 7.1.

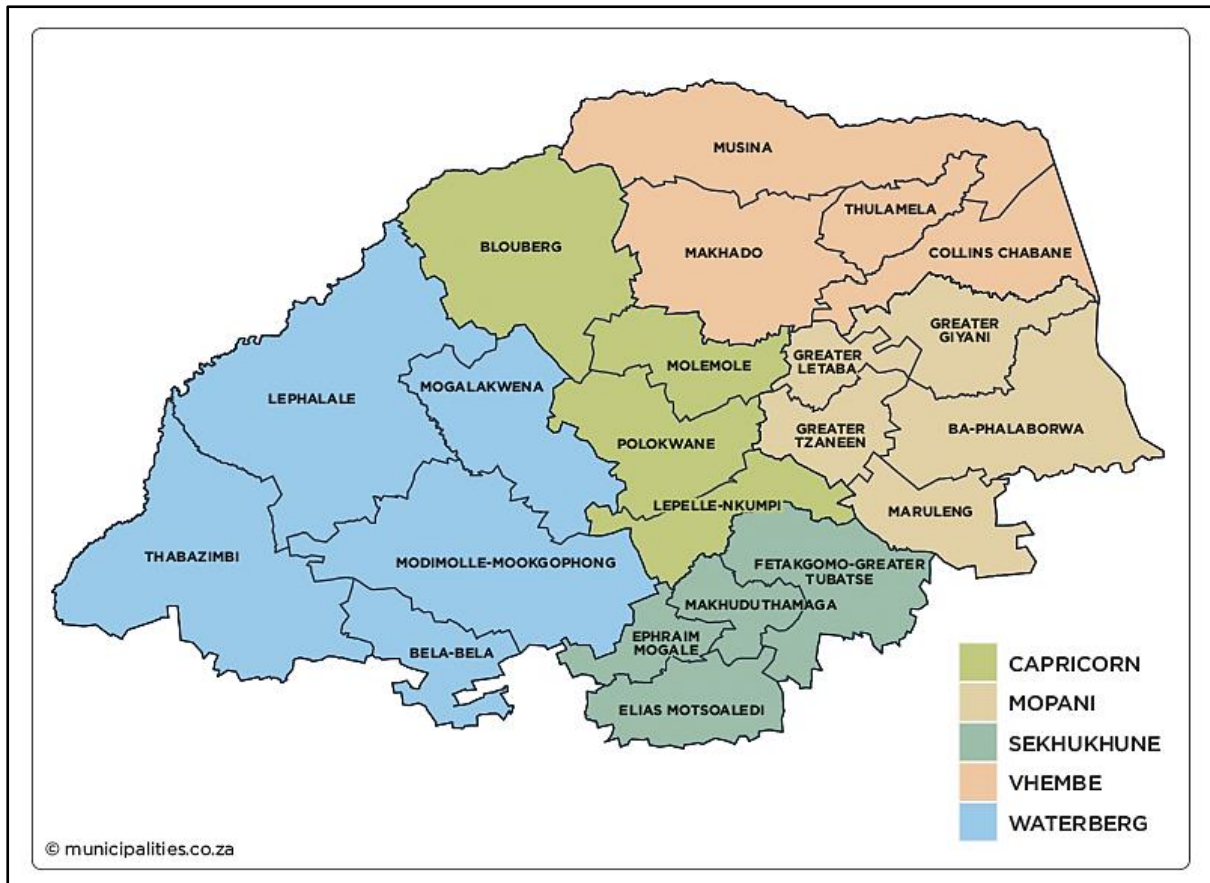


Figure 7.1: District Municipalities of the Limpopo Province.

Waterberg District Municipality

The Waterberg District Municipality (DM) is a Category C municipality situated in the western part of the Limpopo Province, sharing borders with the Capricorn DM to the north and the Sekhukhune DM to the east. To the south-west, the Waterberg DM is adjacent to the North West Province, while the Gauteng Province lies to its south-east.

As the largest of the five district municipalities in the Limpopo Province, the Waterberg DM encompasses over a third of the province's total area. It plays a significant role as a border control region, with five border control points: Groblersbrug, Stockpoort, Derdepoort, Zanzibar, and Platjan, strategically located along the South African and Botswana border. The major towns within the district include Bela-Bela, Lephalale, Modimolle, Mookgophong, and Thabazimbi.

One notable feature of the region is the Waterberg Biosphere, a UNESCO-designated Biosphere Reserve. This expansive area, spanning approximately 654 033 hectares, showcases an intricate rock formation shaped by millions of years of riverine erosion, resulting in stunning bluff and butte landforms.

The region's economy thrives on mining, tourism, and agricultural activities, with mining serving as the primary economic driver. The Waterberg DM is renowned as one of South Africa's premier ecotourism destinations, offering diverse wildlife, birdlife, and picturesque landscapes throughout the region. Key minerals extracted in the area include platinum, iron ore, coal, and diamonds, with the region contributing 40% of the national coal reserves. The Medupi Power Station, the fourth largest in the world, is also located in this district, playing a crucial role in power generation for South Africa.

Agriculture in the Waterberg DM is predominantly focused on game farming, although livestock and the cultivation of crops such as cotton, sunflowers, tobacco, and soybeans are also prevalent. The district's tourism industry thrives on the diverse Bushveld region, encompassing privately owned game reserves that provide opportunities for leisure activities and hunting.

The Waterberg DM is further divided into five local municipalities: Bela-Bela LM, Lephalale LM, Modimolle-Mookgophong LM, Mogalakwena LM, and Thabazimbi LM.

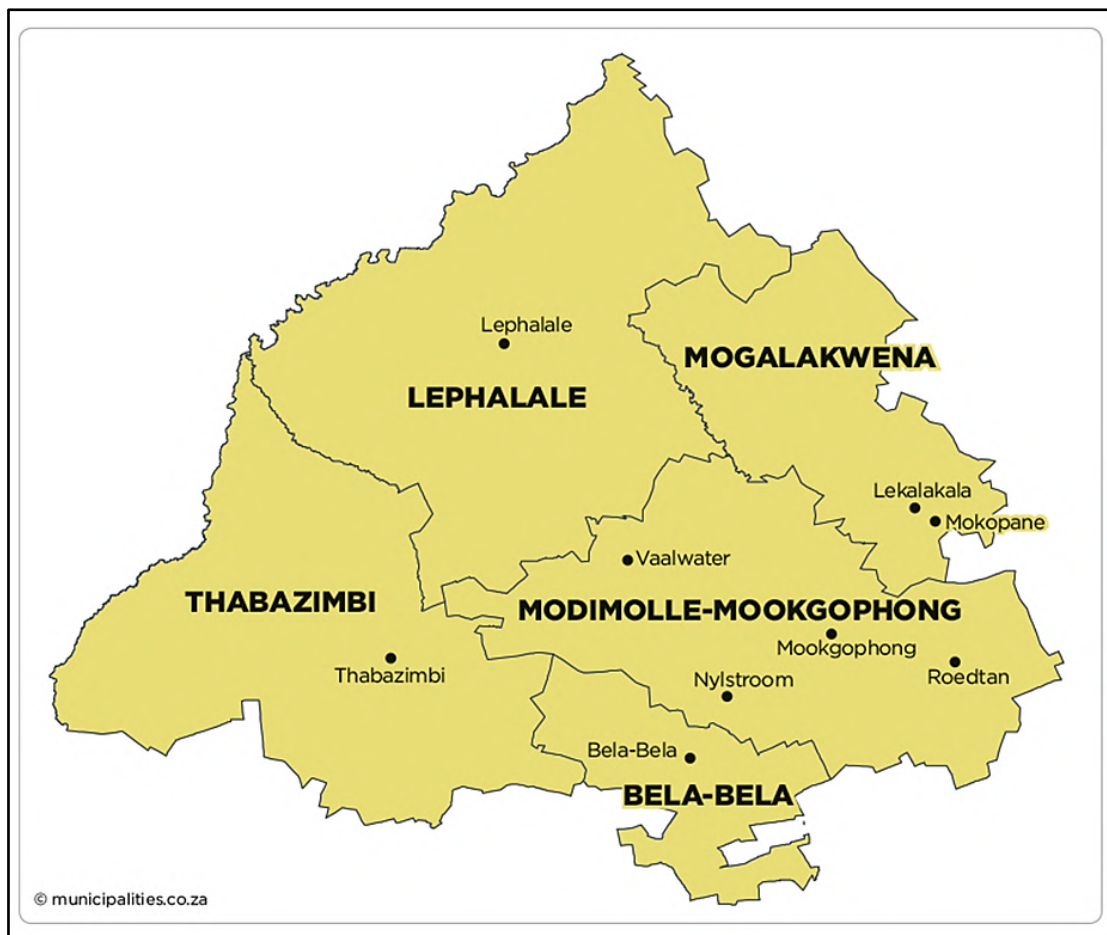


Figure 7.2: Local Municipalities of the Waterberg District Municipality.

Thabazimbi Local Municipality

The Thabazimbi Local Municipality (LM) is a Category B municipality situated within the Waterberg District Municipality, located in the south-western part of the Limpopo Province. It shares borders with the Lephalale LM to the north, and the Modimolle-Mookgophong LM and Bela-Bela LM to the east, all of which are part of the Waterberg DM. The northern boundary of the municipality is shared with Botswana, while its southern boundary adjoins the North West Province. The municipality encompasses the town of Thabazimbi and mining towns like Amandelbult Mine town.

The town of Thabazimbi and the entire municipality derive their name from the Tswana language, meaning "mountain of iron." This name originated from the discovery of abundant iron ore by J.H. Williams at Vliegpoort in 1919. Mining activities in the region began in the 1930s, primarily supporting the production of iron and steel. In addition to iron ore, the area is known for its platinum deposits and andalusite.

Agriculture plays a significant role in driving the local economy, with the production of commodities such as wheat, beans, and maize contributing to the region's prosperity. The Thabazimbi area also attracts tourism, with notable attractions including the Marakele National Park. The National Parks Board supports the park to the same high standards as the renowned Kruger National Park and Mapungubwe.

Mirach Solar PV Project Site

The area surrounding the Mirach Solar PV Project is characterised mostly by a low number of farmsteads/ buildings that are sparsely populated. The area is located in the agricultural region of the area with livestock and game farming the most prominent activities. The area surrounding the development is low in development and features cattle and game farming. The proposed development is also situated in a serene Bushveld setting that is renowned for its tranquillity. The area is a popular destination for tourists who are drawn to hunting and the complete safari experience. Additionally, the region also attracts international hunters seeking an authentic African hunting experience. Although the project is in close proximity to private nature reserves, these reserves are mainly used for hunting and livestock farming.

The Mirach Solar PV Project is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties currently used for grazing. The affected farm portion has not been considered for an alternative future land use such as urban development, agriculture or mining.

7.2 Biophysical Environment

The biophysical environment is described with specific reference to soils, agricultural potential, vegetation and landscape features, climate, biodiversity, heritage features (in terms of archaeology and palaeontology), the visual landscape and the social environment to be affected. The area surrounding the proposed development is characterised mostly by agricultural development except to the west where urban development is present, i.e., the town of Northam. The project area is in a rural setting with the current land use of the site being natural grazing. Specific features present within the development area that may be affected by the Mirach Solar PV Project are further explored and described below.

7.3 Climatic Conditions

The area within which the Mirach Solar PV Project is characterised by a summer rainfall and very dry winters, with a mean annual precipitation ranging between 500 and 600 mm. These areas are known to have warm-temperate conditions with dry winters. The vegetation types present within the development area (identified as Dwaalboom Thornveld and Western Sandy Bushveld) have the highest annual potential evaporation of the savanna vegetation units outside of the two Kalahari bioregions.

7.4 Soil, Terrain and Geological Aspects

A Soil and Agricultural Compliance Statement (Appendix E4) has considered the soil characteristics of the development area / site and the development footprint within which the Mirach Solar PV Project is proposed.

According to the land type database the development (including the grid connection corridor) falls within the Ae 250, Bd 42, Ea 150 and Ea 157 land types (South African soil classification working group, 2018). Ae 250 land type is predominated by Hutton and Mispah soil forms with also the occurrence of other soil forms occurring throughout the terrain. The Bd 42 land type is dominated by Avalon, Longlands and Dundee soil forms. The Ea 150 land type is dominated by the Arcadia soil form. Lastly, the Ea 157 land type is predominated by Shortland and Arcadia soil forms. The geology of the Ae 250, Bd 42, Ea 150 and Ea 157 land types include Waterberg group, Nylstroom subgroup; siltstone, shale, sandstone, grit, and diabase.

The south western corner of the Mirach Solar PV Project development area is underlain by Quaternary alluvium while the rest is underlain by diabase and the Nylstroom Subgroup of

the Waterberg Group. Updated Geology (Council of Geosciences) refined the geological map and indicate that the proposed development is underlain by alluvium, colluvium, elluvium and gravel as well as diabase and the Aasvoëlkop Formation of the Matlabas Subgroup (Waterberg Group). Refer to Figure 7.3.

The slope percentage of the development area has been calculated and is illustrated in Figure 7.4. Most of the regulated area is characterised by a slope percentage between 0 - 2% with some irregularities in areas with slopes reaching 7%. This illustration indicates a non-uniform topography with occurrence of some steep sloping areas being present. The Digital Elevation Model (DEM) of the development area (Figure 7.5) indicates an elevation of 953 to 996 Metres Above Sea Level (MASL).

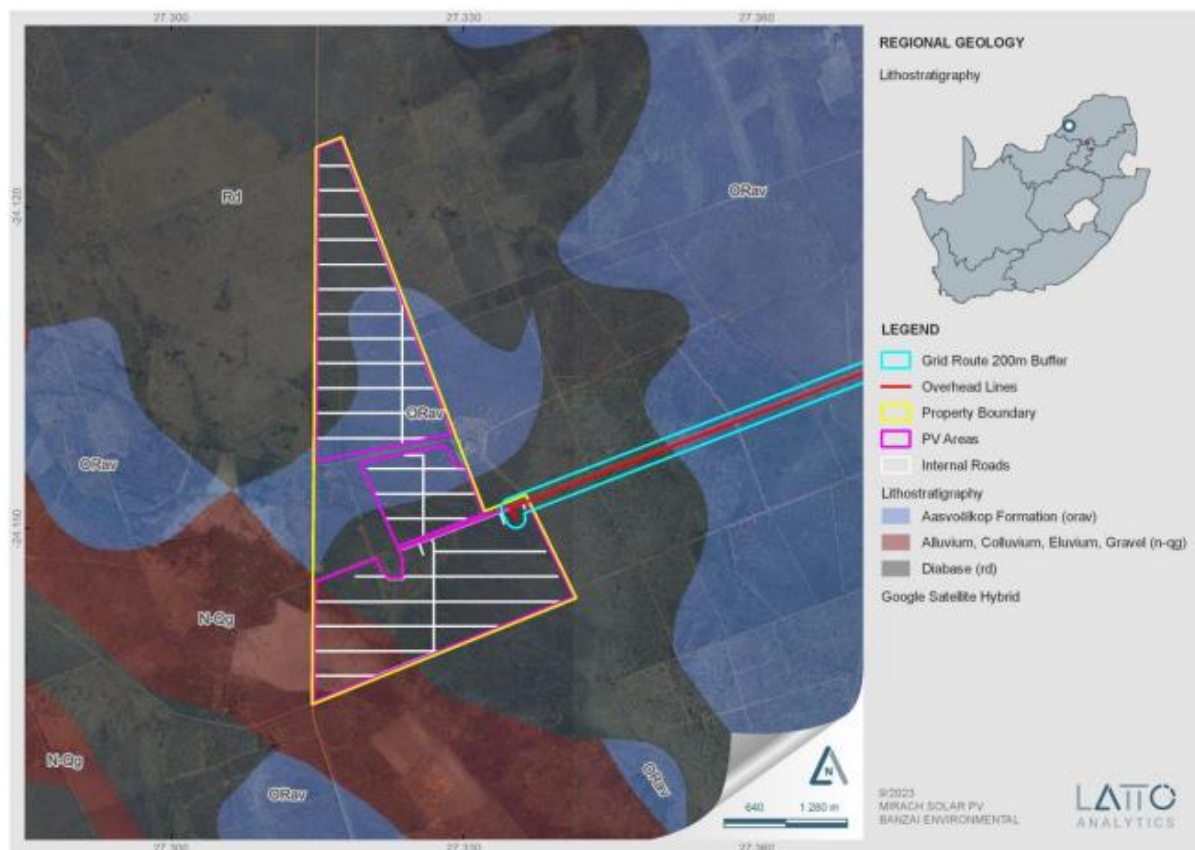


Figure 7.3: Updated Geology (Council of Geosciences, Pretoria) indicates that a portion of the development is underlain by the alluvium, colluvium, eluvium and gravel while the rest is underlain by diabase and the Aasvoëlkop Formation of the Waterberg.

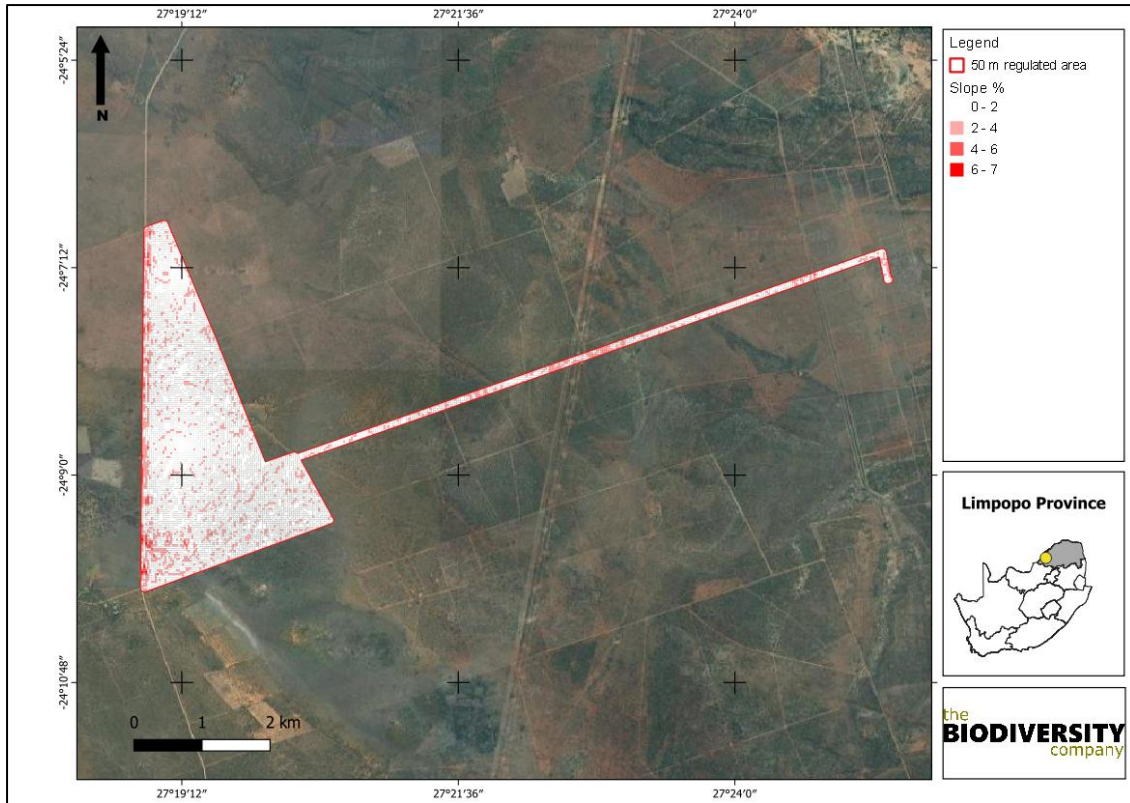


Figure 7.4: Slope percentage of the development area.

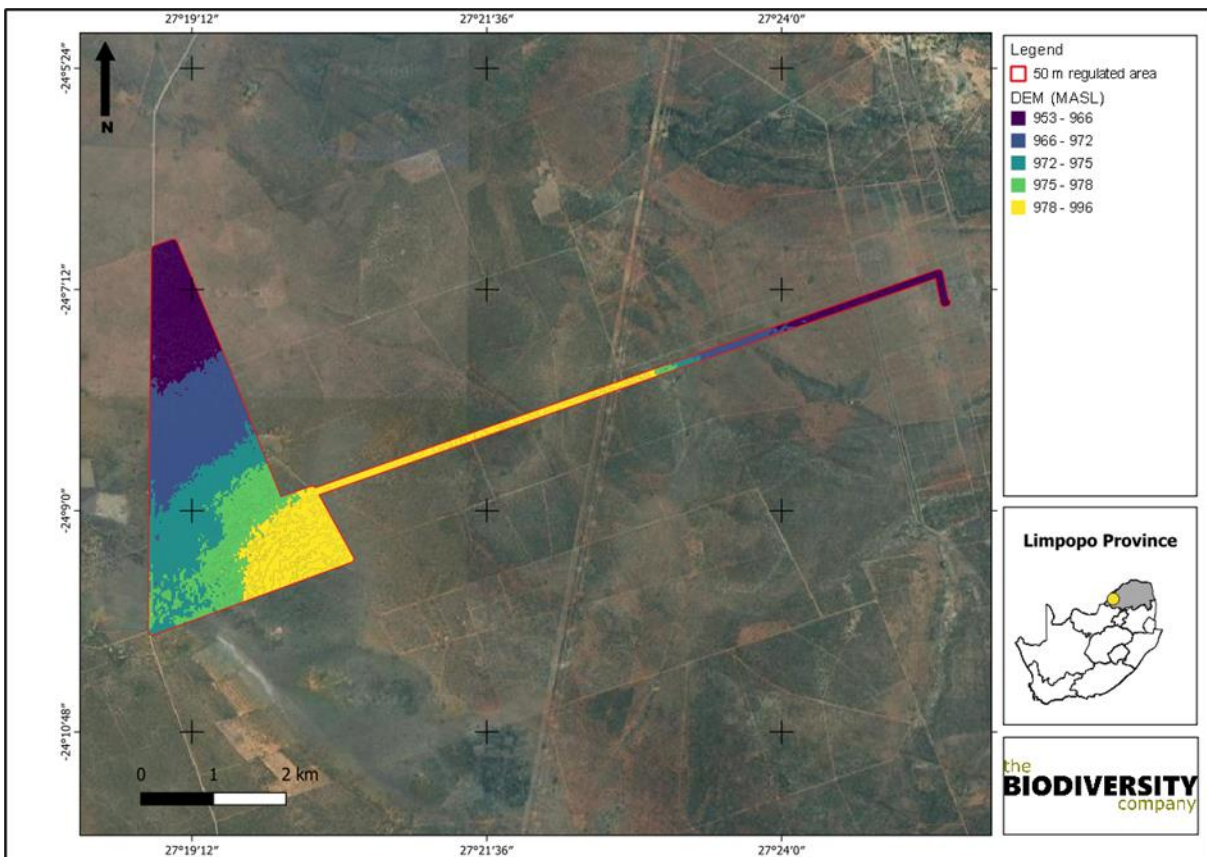


Figure 7.5: Digital Elevation Model of the project area (Metres Above Sea Level).

7.5 Land Capability and Agricultural Potential

The dominant soil forms identified within the development area and grid connection corridor include Hutton, Rustenburg, Glenrosa, Dundee soil forms (Figure 7.6). The most sensitive soils in the development area include the Hutton and Dundee forms. The Hutton soil form consists of an orthic topsoil underlain by a thick red apedal subsoil. The Rustenburg soil form consists of a vertic topsoil that is underlain by a lithic horizon. The Glenrosa soil form consists of an orthic topsoil underlain by a lithic subsoil horizon. The Mispah soil form consists of an orthic topsoil on top of a hard rock. Lastly, the Dundee soil form consists of a thick alluvial subsoil horizon.

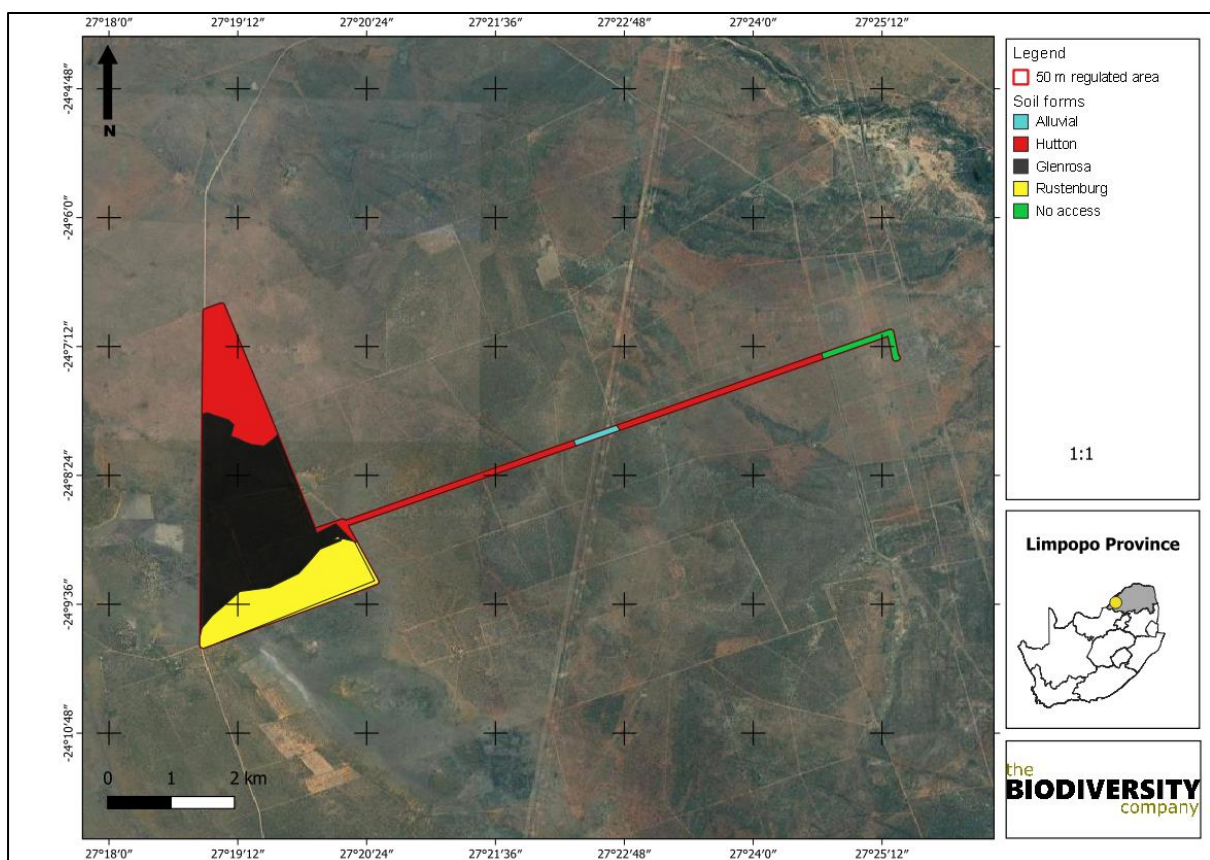


Figure 7.6: Dominant soil form distribution within the development area.

The above-mentioned soil forms have been determined to have land capacity classes of “III” and VI” with a climate capacity level 8 given the Low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The land capacity class “IV” is characterised by arable lands with moderate to severe limitations resulting due to erosion and wetness limitations. The combination between the determined land capacity class and climate capacity results in land potential “L6”. The “L6” land potential level is characterised by very restricted potential due to regular and severe limitations due to soil,

slope, temperatures, or rainfall. This area is characterised by both arable and non-arable lands, and it is characterised with an overall “Medium” sensitivity.

The baseline findings and the Land Capability sensitivity as per the Department of Agricultural, Forestry and Fisheries (DAFF, 2017) national raster file concur with one another, with the sensitivity of the area ranging from “Low to Moderate”. Mirach Solar PV Project is characterised with “Low to Moderate” and “Moderate to High” land capability sensitivities. Furthermore, the DFFE (2023) screening agricultural theme (Appendix B) also indicates that the development area also falls within areas with high crop field sensitivity areas. Refer to Figure 7.7, 7.8 and 7.9.

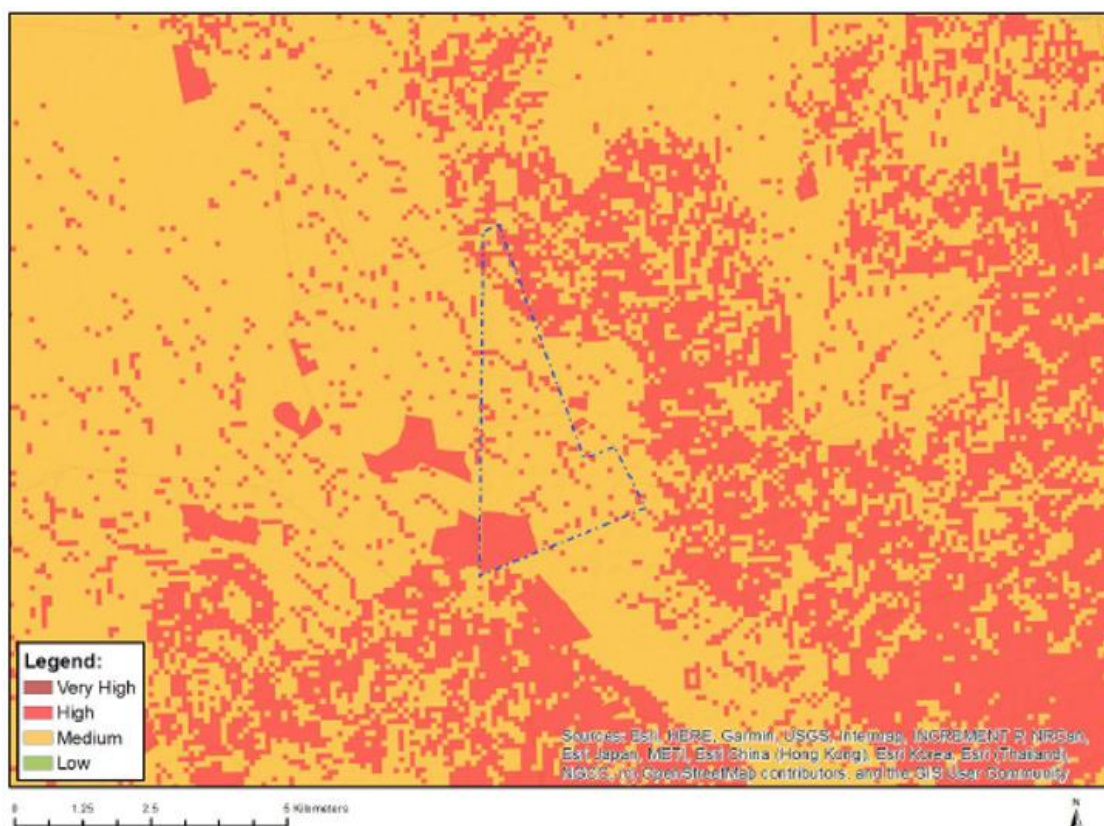


Figure 7.7: Relative Agricultural Theme sensitivity as per the DFFE Screening Tool Report (Appendix B) specific to the PV area under assessment.

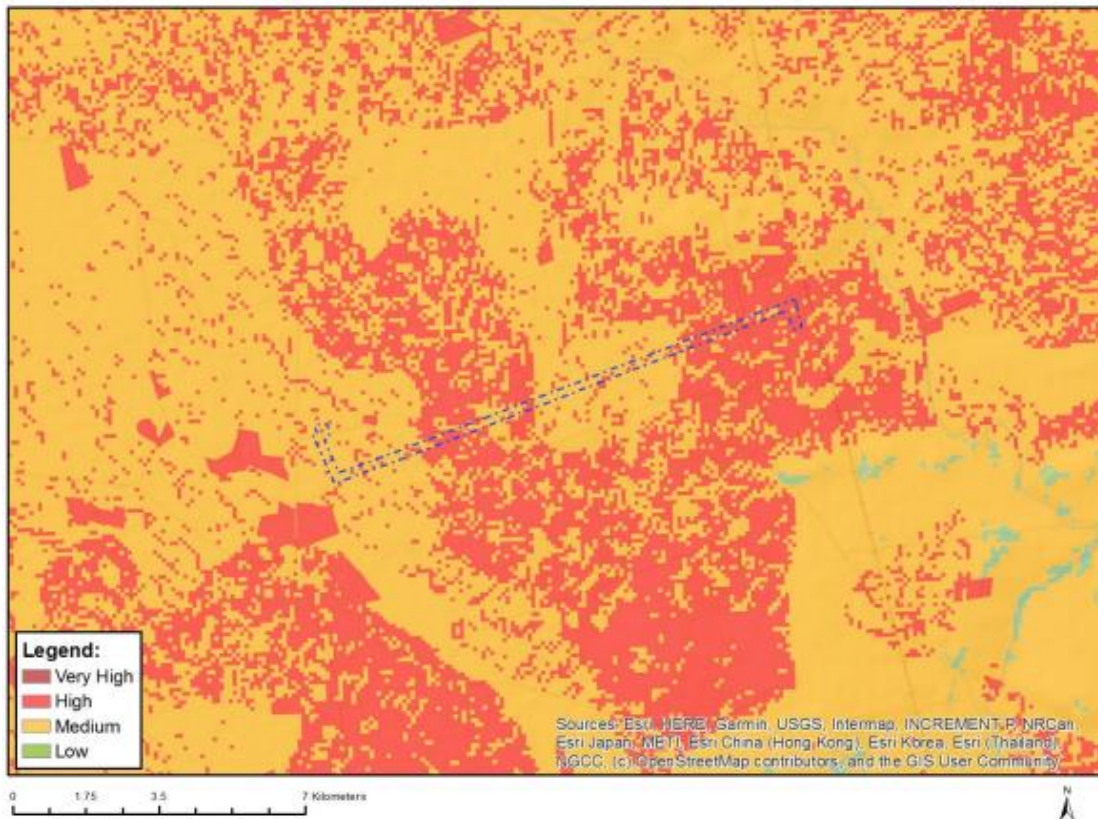


Figure 7.8: Relative Agricultural Theme sensitivity as per the DFFE Screening Tool Report (Appendix B) specific to the grid connection corridor under assessment.

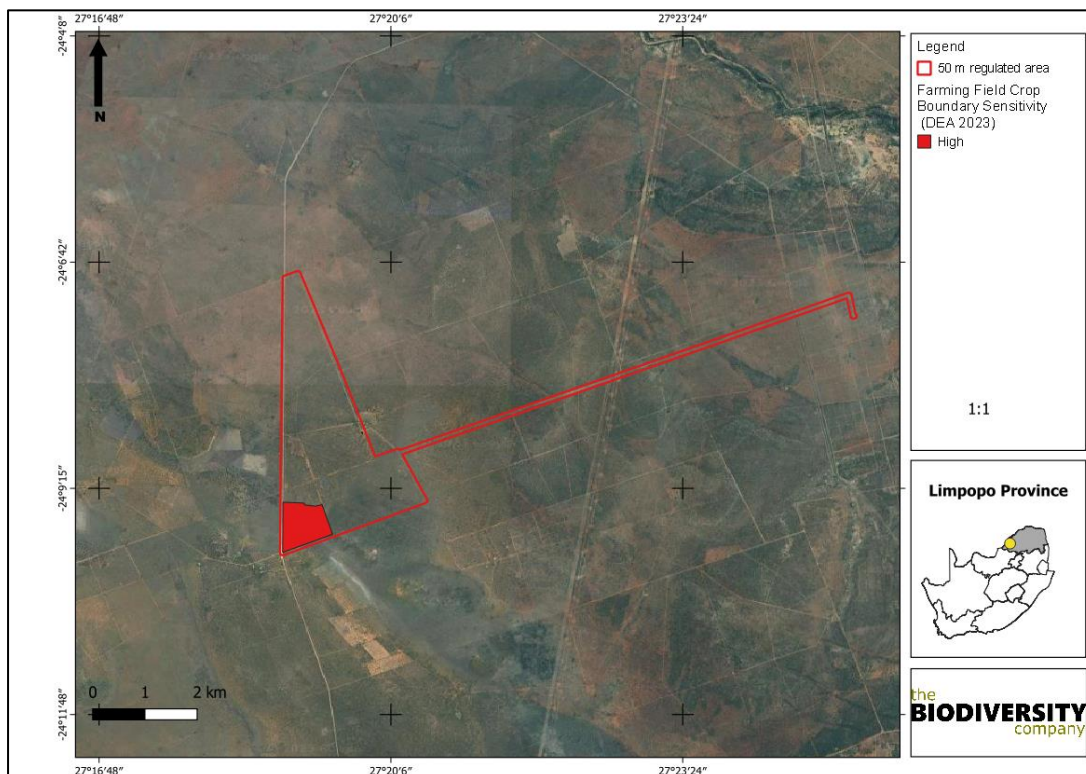


Figure 7.9: Crop field boundary for the Mirach Solar PV Project identified as per the DFFE Screening Tool Report (Appendix B).

The land capability and land potential of the resources in the development area are both characterised by “Moderate” sensitivities. The disputed “Moderate High” sensitivity areas were verified by the specialist on site with soils like the Glenrosa and Rustenburg soil forms being confirmed and the corresponding “Very Low to Low” land capability sensitivity. Therefore overall, the development area can be re-categorised as “Low” sensitivity based on the verified baseline findings, which conforms to the requirements of an agricultural compliance statement only (Appendix E4).

The dominant Glenrosa soil form has a poor land potential, due to shallow soil profile depths that can limit cropping practices significantly. Moreover, the available harsh climatic conditions restrict most cropping practices. In the development area, there is segregation of agricultural lands or crop fields with high potential according to the DFFE (2023). It is the specialist’s recommendation that such potential crop fields be avoided for the project to preserve them. In a case relocating of the project is not feasible, the stakeholders can obtain consent for use of these areas or can engage with the owners of the crop fields for an appropriate compensation for the use of those crop fields.

However, following the verified baseline findings, no active crop fields were identified and confirmed within the proposed development area by the specialist during the field survey. The baseline findings of the identified highly sensitive crop fields are disputed as they fall on restrictive soil form that also limits cropping practices significantly. It is the specialist’s opinion that the proposed project will have limited impacts on the agricultural production ability of the land. Refer to the Soils and Agricultural Compliance Statement (Appendix E4).

7.6 Terrestrial Biodiversity

A Terrestrial Ecology Baseline and Impact Assessment (Appendix E1) has been undertaken for the development area which included a summer survey undertaken from 2-3 May 2023. The following subsections describe the site from a terrestrial perspective.

7.6.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers have been considered to establish how the Mirach Solar PV Project might interact with any ecologically important entities.

7.6.1.1 Critical Biodiversity Areas

The key output of this systematic biodiversity plan is a map of biodiversity priority areas. The Limpopo CBA map delineates Critical Biodiversity Areas (CBA), Ecological Support Areas (ESA), Other Natural Areas (ONA), Protected Areas (PA), and areas that have been irreversibly modified from their natural state. Figure 7.9 shows that the Mirach Solar PV Project overlaps with the Terrestrial features classified as:

- CBA 1 (grid connection corridor only);
- CBA 2 (grid connection corridor only);
- ONA;
- NNR; and
- ESA 1.

A small section the northern most boundary of the grid connection corridor overlaps with a CBA 1 and CBA 2. These areas can easily be avoided through the careful placement of the power line route within the grid connection corridor.

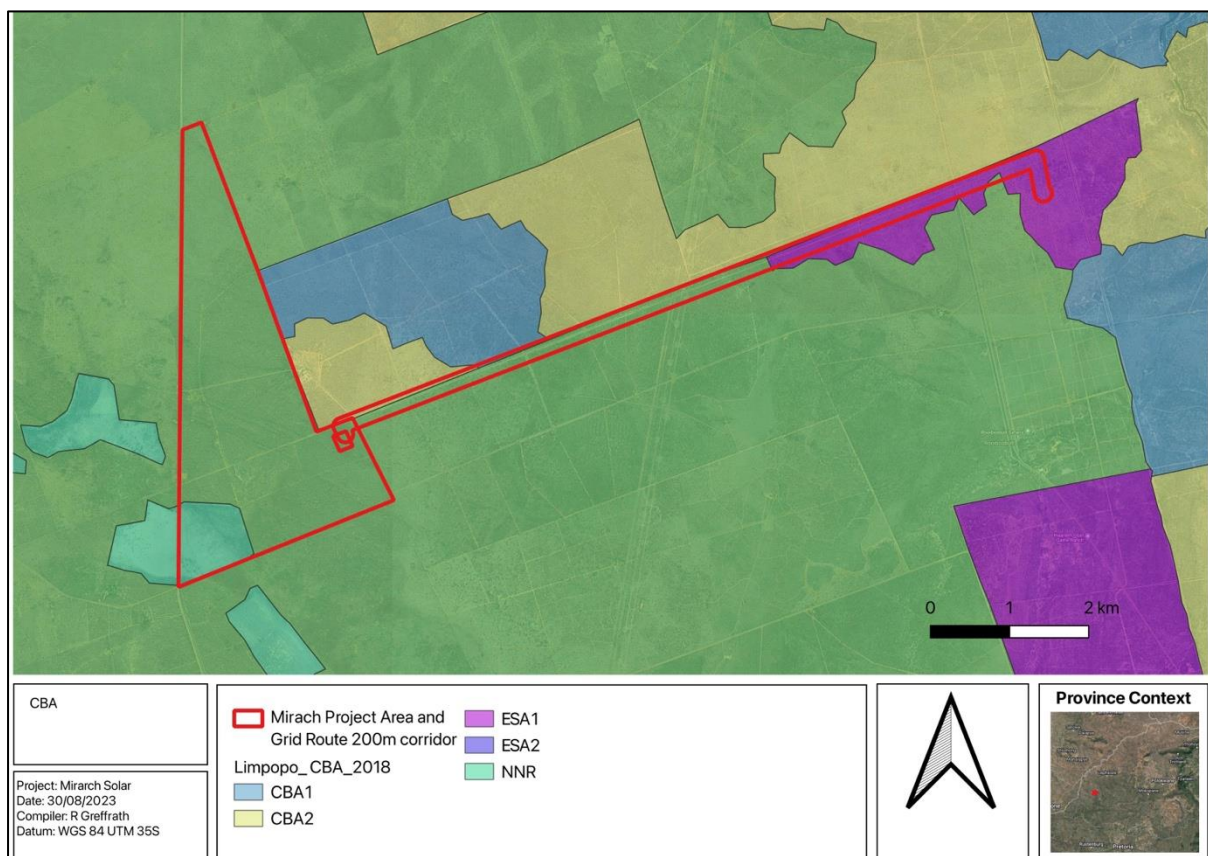


Figure 7.10: Terrestrial CBA features in relation to the Mirach Solar PV Project.

7.6.1.2 National Biodiversity Assessment

In terms of the National Biodiversity Assessment 2018 the Ecosystem Threat Status and the Ecosystem Protection Level has been considered.

The Ecosystem Threat Status is an indicator of an ecosystem’s wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT) or Least Concern (LC). The Mirach Solar PV Project overlaps with a LC ecosystem. Refer to Figure 7.10.

The Ecosystem Protection Level is an indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP). The Mirach Solar PV Project overlaps mainly with a MP, PP and WP ecosystem. Refer to Figure 7.11.

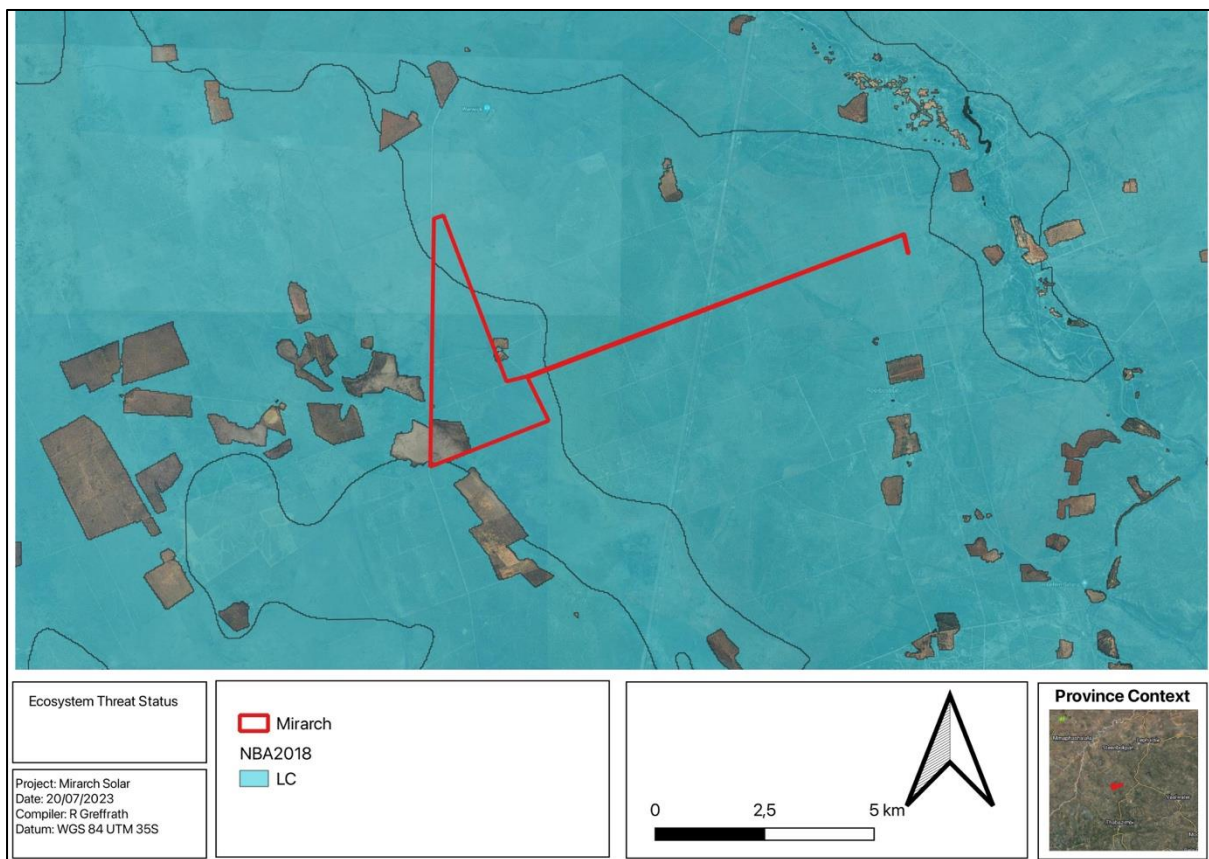


Figure 7.11: Ecosystem Threat Status associated with the Mirach Solar PV Project.

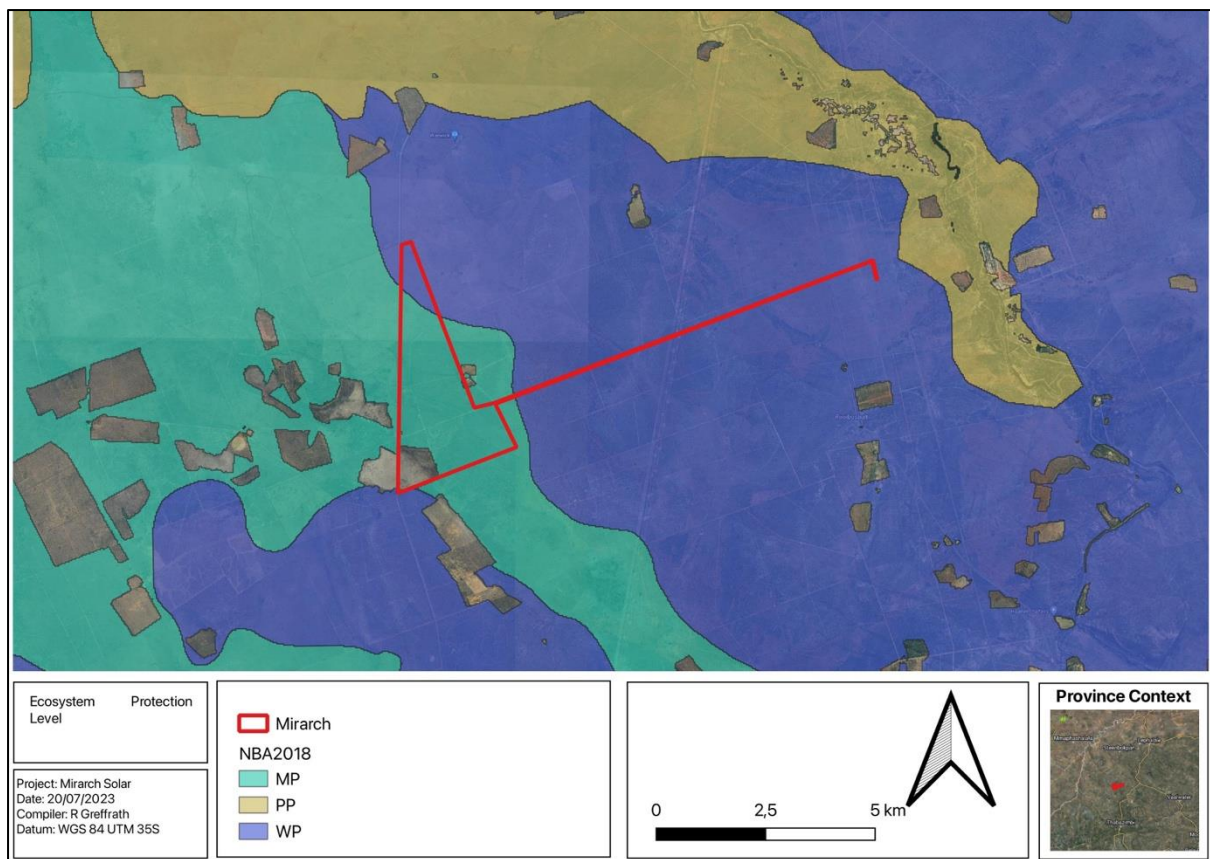


Figure 7.12: Ecosystem Protection Level associated with the Mirach Solar PV Project.

7.6.1.3 Protected Areas and National Protected Areas Expansion Strategy

According to the protected area spatial datasets from SAPAD (DFFE, 2022) and SACAD (DFFE, 2022). The Mirach Solar PV Project falls within 5 km of two SAPAD classified areas. These are known as the Rooiboshcbult Private Nature Reserve/ Oom Karel Private Nature Reserve located directly to the east and the Kastrol Private Nature Reserve located to the northeast. Refer to Figure 7.13.

National Protected Area Expansion Strategy (NPAES) areas were identified through a systematic biodiversity planning process. They presented the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with a strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases, only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine-scale planning, which may identify different priority sites based on local requirements, constraints and opportunities (DFFE, 2021). Mirach Solar PV Project overlaps with a Priority Focus Area, which is related to the Rooiboshcbult Private Nature Reserve/ Oom Karel Private Nature Reserve (Figure 7.14).

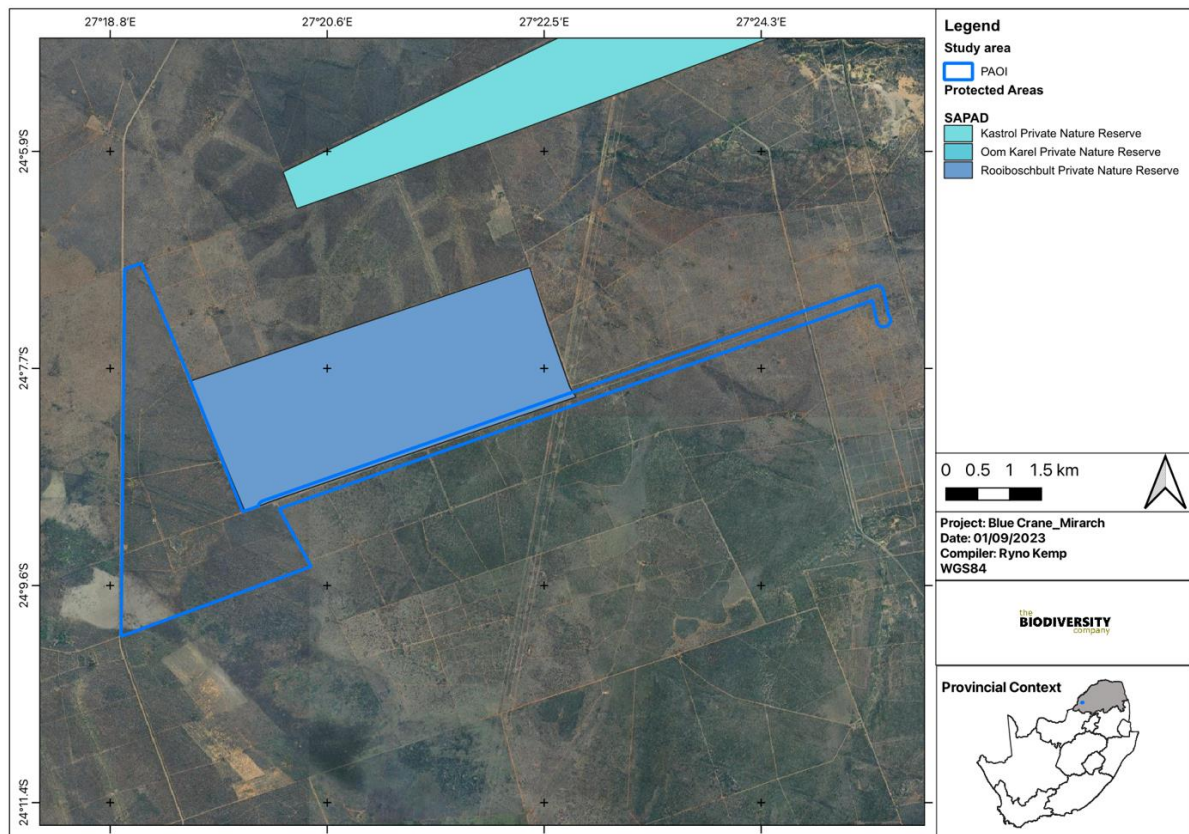


Figure 7.13: Mirach Solar PV Project in relation to Conservation and Protected Areas.

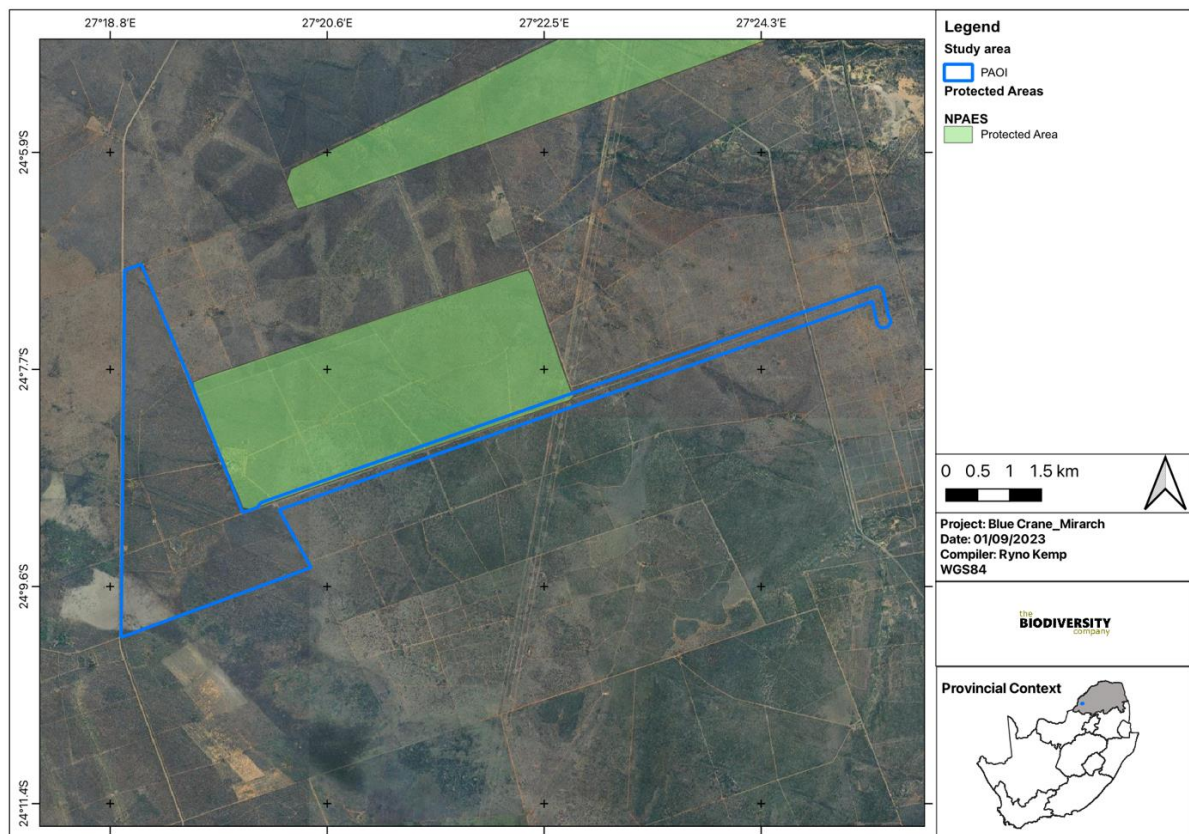


Figure 7.14: Mirach Solar PV Project in relation to NPAES Focus Areas.

7.6.2 Description of the Vegetation

Mirach Solar PV Project is situated within the savanna biome. The savanna vegetation of South Africa represents the southernmost extension of the most widespread biome in Africa. Most savanna vegetation communities are characterised by a herbaceous layer dominated by grasses and a discontinuous to sometimes very open tree layer (Mucina & Rutherford, 2006).

Savannas are characterised by dominant grass layers, over-topped by a discontinuous, but distinct woody plant layer. At a structural level, Africa’s savannas can be broadly categorised as either fine-leaved (microphyllous) savannas or broad-leaved savannas. Fine-leaved savannas typically occur on nutrient rich soils and are dominated by microphyllous woody plants of the Mimosaceae family (Common genera include *Vachellia*, *Senegalia* and *Albizia*) and a generally dense herbaceous layer.

Mirach Solar PV Project falls within two vegetation types namely the Dwaalboom Thornveld and the Western Sandy Bushveld. Refer to Figure 7.15.

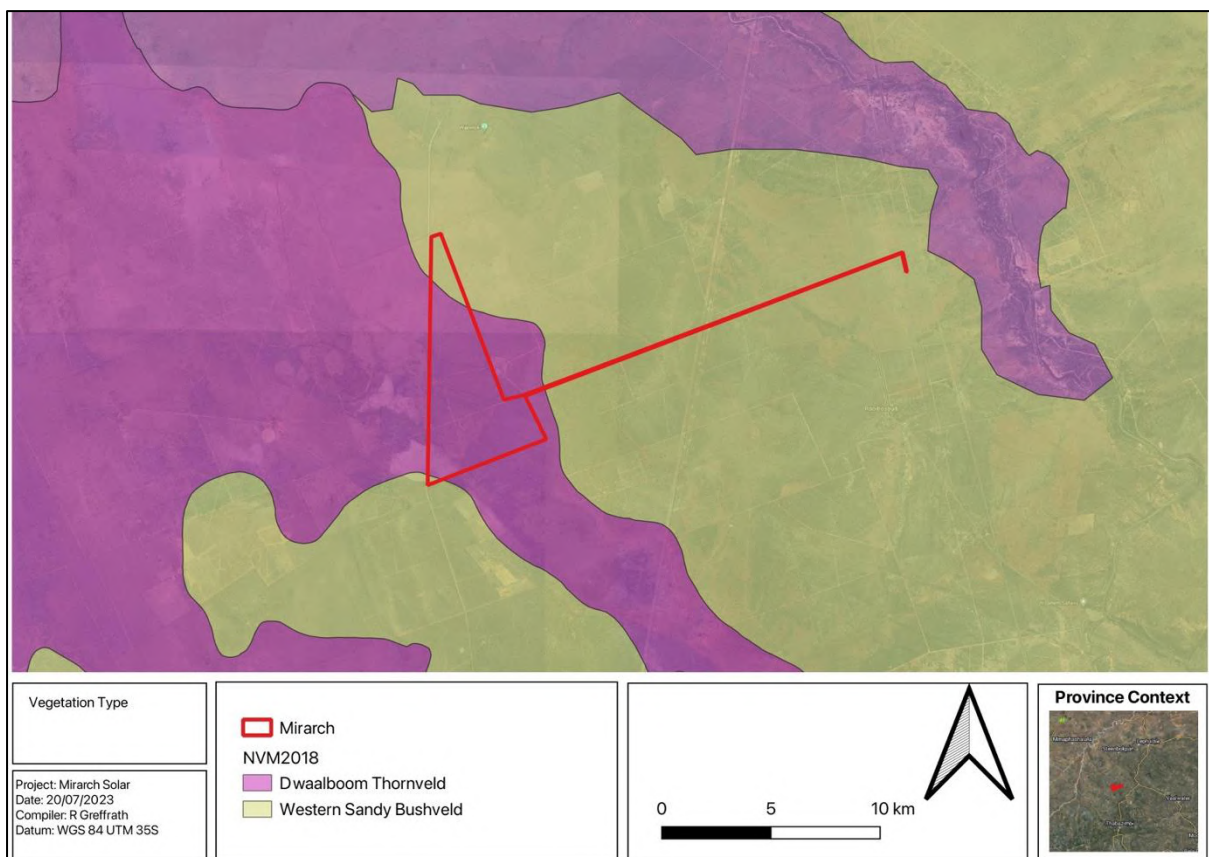


Figure 7.15: Mirach Solar PV Project in relation to the vegetation types present.

Dwaalboom Thornveld

Vegetation and landscape features include plains with layers of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species. *Vachellia tortilis* and *V. nilotica* dominate on the medium clays (at least 21% clay in the upper soil horizon but high in the lower horizons). On particularly heavy clays (>55% clay in all horizons) most other woody plants are excluded and the diminutive *Vachellia tenuispina* dominates at a height of less than 1 m above ground. On the sandy clay loam soils (with not more than 35% clay in the upper horizon but high in the lower horizons) *Senegalia erubescens* is the most prominent tree. The alternation of these substrate types creates a mozaic of patches typically 1–5 km across the areas.

The vegetation type has a conservation status of Least Threatened and a target of 19% for conservation. Some 6% is statutorily conserved, mostly within the Madikwe Game Reserve in the west. About 14% has been transformed mainly by cultivation. Erosion is very low to low. Main use is extensive cattle grazing.

Western Sandy Bushveld

Vegetation and landscape features vary from tall open woodland to low woodland, broad-leaved as well as microphyllous tree species prominent. Dominant species include *Acacia erubescens* on flat areas, *Combretum apiculatum* on shallow soils of gravelly upland sites and *Terminalia sericea* on deep sands. The vegetation type occurs on slightly undulating plains.

The vegetation type has a conservation status of Least Threatened and a target of 19% for conservation. About 6% is statutorily conserved, just over half of which is in the Marakele National Park. About 4% has been transformed mainly by cultivation. Erosion is very low to low.

7.6.2.1 Results of the Flora survey

Expected Flora Species

The POSA database indicates that 39 species of indigenous plants are expected to occur. No flora Species of Conservation Concern (SCC) is expected to be associated with the Mirach Solar PV Project Development Footprint.

Field assessment results

The field assessment identified two main vegetation habitat units associated with Mirach Solar PV Project which includes the dry bushveld and disturbed old lands. These vegetation units were identified using vegetation characteristics such as dominant species, land use and vegetation structure.

The dry Bushveld areas have been impacted by historic grazing, browsing and mismanagement, it was evident that selective grazing by game animals takes place. Three dry bushveld variations, from a botanical perspective, were delineated. These variations include Grewia Bushveld, Thorny Bushveld and Rocky Bushveld. Although the habitat units are not entirely transformed, ongoing and historic disturbances have resulted in the plant community no longer being fully representative of the reference vegetation.

- Grewia Bushveld – present within the northern portion of the affected property and is closely resembling Western Sandy Bushveld characterised by the dominance of *Grewia bicolor*, *G. flava*, and *G. monticola*.
- Thorny Bushveld – is dominant in the central section of the affected property, where it coincided with the Dwaalboom thornveld vegetation type. This vegetation type was dominated by the prevalence of *Vachellia* and *Senegalia spp* such as *Senegalia erubescens*, *Vachellia nilotica*, *V. tortilis subsp. heteracantha*, *S. fleckii*, and *V. mellifera*.
- Rocky Bushveld – is present within a small portion of the grid connection corridor where it crosses a small hill/koppie, hence the rockiness. This habitat unit can therefore be regarded as important, not only within the local landscape, but also regionally; it acts as a refuge, used for habitat, foraging area and movement corridors for fauna.

The disturbed old lands were found to be transformed and in a constant disturbed state due to historic ploughing, this area cannot recover to a more natural state due to ongoing disturbances. Other than small, fragmented pockets, individual trees and some areas where natural vegetation has spontaneously rehabilitated, no natural vegetation remains in this vegetation type. Historically these old lands were cultivated with monoculture.

Refer to Figures 7.16 and 7.17 below.

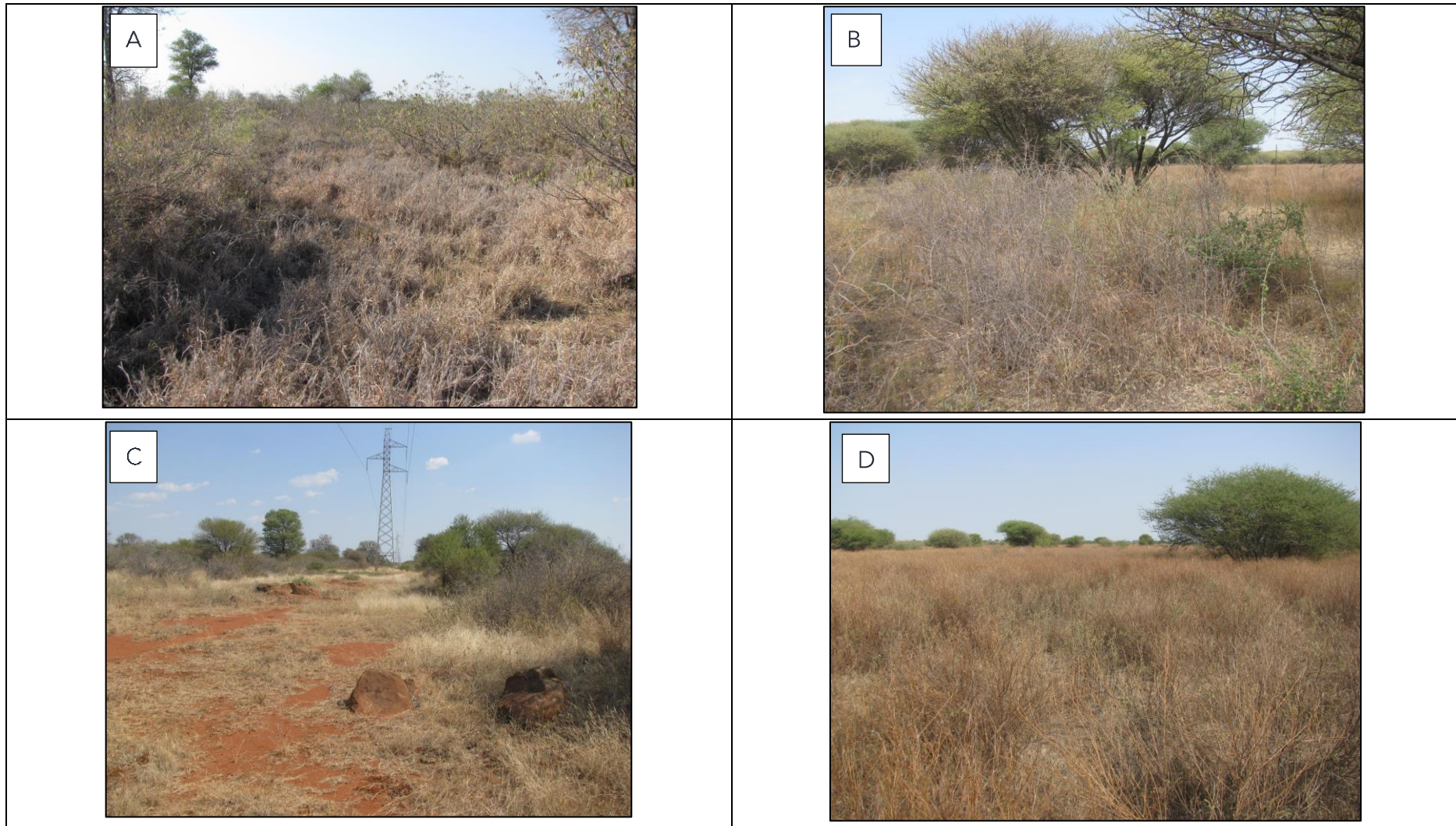


Figure 7.16: Photographs of the vegetation habitat units associated with Mirach Solar PV Project (a –Grewia Bushveld, b – Thorny Bushveld, c – Rocky Bushveld, d – old lands)

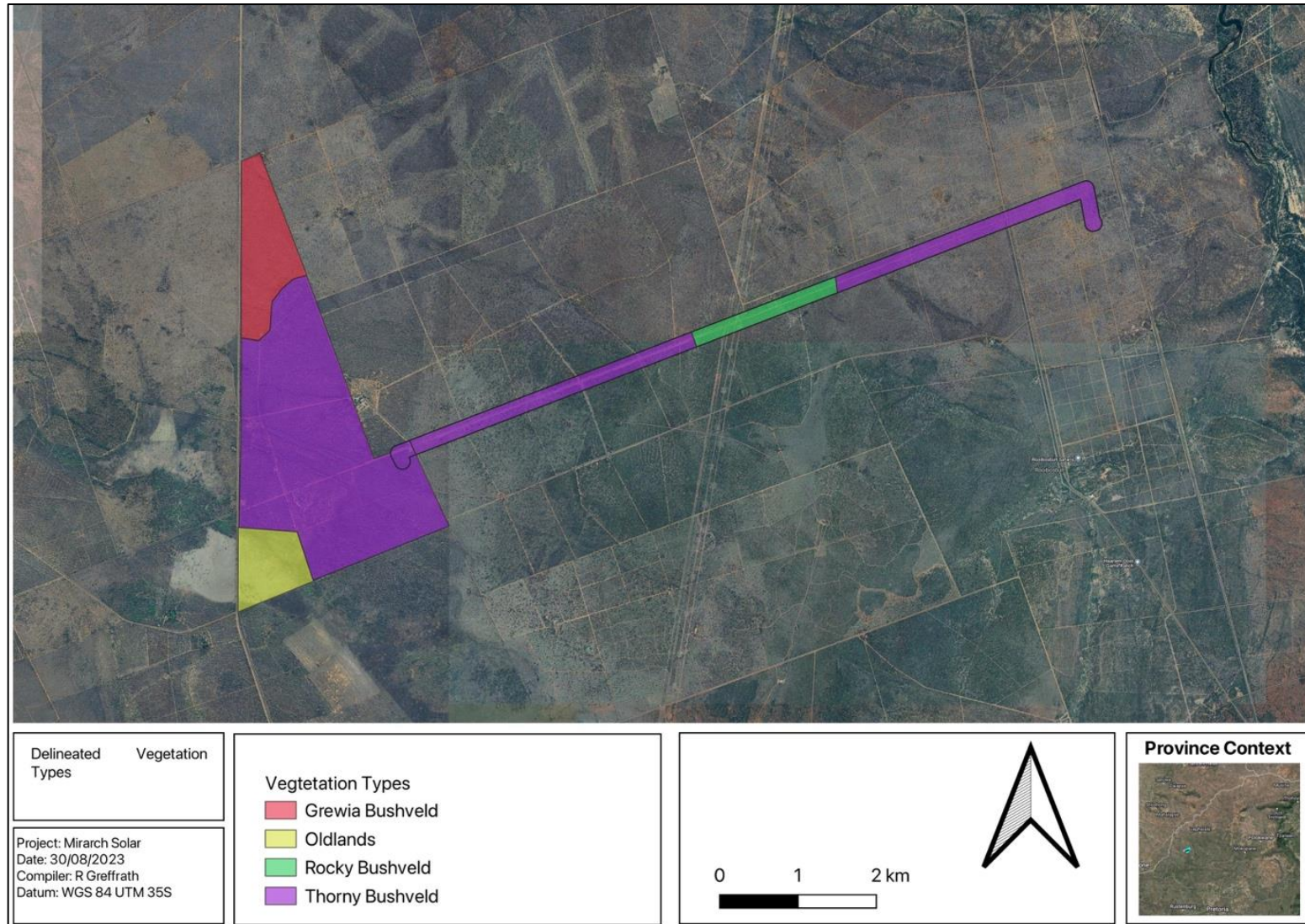


Figure 7.17: Delineated vegetation types associated with Mirach Solar PV Project

Indigenous Vegetation

A total of 51 tree, shrub and herbaceous plant species were recorded in the development area during the field assessment. The list of plant species recorded is by no means comprehensive, and repeated surveys during different phenological periods not covered, may likely yield up to 10% additional flora species for the development footprint. However, floristic analysis conducted to date is regarded as a sound representation of the local flora for the Mirach Solar PV Project. Refer to Table 7.1.

Table 7.1: Trees, shrubs and herbaceous plant species recorded for Mirach Solar PV Project.

Species	Common Name	Growth Form/Alien Category	Threat Status (SANBI, 2017)
<i>Abutilon austro-africanum</i>		Herb	
<i>Aptosimum elongatum</i>		Herb	
<i>Aristida congesta barbicolis</i>	Spreading three awn	Grass	
<i>Aristida congesta congesta</i>	Tassel Tree-awn	Grass	
<i>Aristida diffusa</i>	Iron Grass	Grass	
<i>Aristida stipitata</i>	Long awned grass	Grass	
<i>Asparagus laricinus</i>	Bushveld Asparagus	Shrub	
<i>Blepharis integrifolia</i>			
<i>Boophane disticha</i>	Poison bulb	Bulb	Protected
<i>Boscia albitrunca</i>	Shepherds tree	Tree	Medicinal SA National tree list
<i>Bothriochloa insculpta</i>	Pinhole grass	Grass	
<i>Chamaecrista absus</i>		Herb	
<i>Clerodendrum ternatum</i>		Shrub	
<i>Combretum apiculatum</i>	Red Bushwillow	Tree	
<i>Combretum imberbe</i>	Leadwood	Tree	Medicinal SA National tree list
<i>Combretum zeyheri</i>	Large fruited Bushwillow	Tree	
<i>Conyza sumatrensis</i>	Tall Fleabane	Herb	Weed
<i>Cymbopogon pospischilli</i>	Narrow-leaved Turpentine Grass	Grass	

<i>Dichrostachys cinerea</i>	Sickle bush	Tree	
<i>Digitaria eriantha</i>	Common Finger Grass	Decreaser - Climax	
<i>Diospyros lycioides</i>	Bluebush	Shrub	
<i>Eragrostis superba</i>	Saw tooth Love grass	Grass	
<i>Euclea undulata</i>	Common guarrie	Shrub	
<i>Geigeria burkei</i>	Vermeersiektebossie	Herb	
<i>Grewia bicolor</i>	White Raisin	Shrub	
<i>Grewia flava</i>	Velvet Raisin	Shrub	
<i>Grewia monticola</i>	Silver raison	Shrub	
<i>Heliotropium ciliatum</i>		Herb	
<i>Hirpicium bechuanense</i>		Herb	
<i>Justicia flava</i>		Herb	
<i>Kyphocarpa angustifolia</i>		Herb	
<i>Limeum fenestratum</i>		Herb	
<i>Lophiocarpus tenuissimus</i>		Herb	
<i>Monsonia angustifolia</i>		Herb	
<i>Panicum maximum</i>	Guinea grass	Grass	
<i>Pavonia burchellii</i>			
<i>Peltophorum africanum</i>	Weeping wattle	Tree	
<i>Perotis patens</i>	Cat's Tail	Increaser 2 - Pioneer to subclimax	
<i>Perotis patens</i>	Cat's Tail	Grass	
<i>Schmidtia pappophoroides</i>	Sand Quick	Grass	
<i>Sclerocarya birrea</i>	Marula	Tree	Medicinal SA National tree list
<i>Senegalia fleckii</i>	Plate thorn	Tree	
<i>Senegalia mellifera</i>	Black thorn	Tree	
<i>Solanum panduriforme</i>	Yellow Bitter-apple	Shrub	
<i>Solanum sisymbriifolium</i>	Wild Tomato	Shrub	
<i>Talinum caffrum</i>		Herb	
<i>Tarchonanthus camphoratus</i>	Wild camphor bush	Shrub	
<i>Terminalia sericea</i>	Silver cluster leaf	Tree	
<i>Vachellia nilotica</i>	Scented thorn	Tree	

<i>Vachellia tortillis</i>	Umbrella thorn	Tree
<i>Ziziphus mucronata</i>	Buffalo thorn	Shrub

Plant Species of Conservation Concern (SCC)

Four of the flora species recorded within the development area during the field survey period is regarded as a SCC, as three tree species are listed on the South African National Tree list, *Boscia albitrunca* (Figure 7.18), *Combretum imberbe* (Figure 7.19) and *Sclerocarya birrea* (Figure 7.20). Mature as well as younger individuals were regularly encountered.



Figure 7.18: *Combretum imberbe* recorded.



Figure 7.19: *Sclerocarya birrea* recorded.



Figure 7.20: *Boscia albitrunca* recorded.

Invasive Alien Plants

Invasive Alien Plants (IAPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of AIP species (Category 1 species). In addition, unless authorised thereto in terms of the NWA, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEMBA:

1. *Category 1a:* Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
2. *Category 1b:* Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
3. *Category 2:* Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
4. *Category 3:* Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Two (2) IAP species were recorded within the development area. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003 as Category 1b, Category 2 and Not Indigenous (Exotic) respectively. The one (1) species is an IAP species that must be controlled by implementing an IAP Management Programme, in compliance with section 75 of the NEMBA, as stated above.

7.6.3 Description of the Fauna Survey

The expected faunal communities present under natural/ unmodified conditions, together with their conservation statuses are explored below.

Based on the IUCN Red List Spatial Data and AmphibianMap, twelve amphibian species are expected to occur within the area. None of these species are threatened.

Based on the IUCN Red List Spatial Data and the ReptileMAP database, eighteen reptile species can be expected to occur within the area. None of these species are threatened.

The Data lists eleven mammal species that could be expected to occur within the area. This list excludes large mammal species that are limited to protected areas. Three (3) of these expected species are regarded as threatened, however all of these have a low likelihood of occurrence based on current land use in the development area. The threatened species include Cheetah, Leopard and the Brown Hyena.

7.6.3.1 Results of the Fauna Survey

The observations and recordings of herpetofauna and mammals are indicated below.

Five species of reptile and no amphibian species were recorded within the development area during the survey period (Table 7.2). However, there is the possibility of more species being present, as certain reptile species are secretive and require long-term surveys to ensure capture.

Table 7.2: Summary of herpetofauna recorded for the Mirach Solar PV Project.

Family	Scientific Name	Common Name	Conservation Status	
			Regional	Global
Reptiles				
Cordylidae	<i>Cordylus jonesii</i>	Limpopo girdled lizard	LC	LC
Lacertidae	<i>Heliobolus lugubris</i>	Bushveld Lizard	LC	LC
Lacertidae	<i>Pedioplanis lineoocellata</i>	Spotted Sand Lizard	LC	Unlisted
Agamidae	<i>Acanthocercus atricollis</i>	Southern Tree Agama	LC	Unlisted
Gekkonidae	<i>Lygodactylus capensis</i>	Common Dwarf Gecko	LC	Unlisted

Ten (10) mammal species were recorded during the survey of the development area (Table 7.2) based visual observations, none of which are regarded as Species of Conservation Concern.

Table 7.3: Summary of mammal species recorded for the Mirach Solar PV Project.

Family	Scientific Name	Common Name	Conservation Status	
			Regional	Global
Bovidae	<i>Sylvicapra grimmia</i>	Common duiker	LC	LC
Canidae	<i>Lupulella mesomelas</i>	Black-backed jackal	LC	LC
Hystricidae	<i>Hystrix africaeaustralis</i>	Cape Porcupine	LC	LC
Leporidae	<i>Lepus saxatilis</i>	Scrub Hare	LC	LC
Bovidae	<i>Tragelaphus strepsiceros</i>	Greater Kudu	LC	LC
Bovidae	<i>Aepyceros melampus</i>	Impala	LC	LC
Equidae	<i>Equus quagga</i>	Zebra	LC	LC
Bovidae	<i>Kobus ellipsiprymnus</i>	Waterbuck	LC	LC
Bovidae	<i>Tragelaphus sylvaticus</i>	Bushbuck	LC	LC
Bovidae	<i>Alcelaphus buselaphus caama</i>	Red Hartebeest	LC	LC

7.7 Aquatic Biodiversity

The Wetland Baseline and Risk Assessment (Appendix E2) has delineated wetland areas in accordance with the DWAF (2005) guidelines. A single site visit was conducted 2nd and 3rd of May 2023. The specialist confirms that no follow-up freshwater survey is required.

The following spatial datasets have been considered by the independent specialist.

7.7.1 South African Inventory of Inland Aquatic Ecosystems

This spatial dataset is part of the South African Inventory of Inland Aquatic Ecosystems (SAIIAE) which was released as part of the National Biodiversity Assessment (NBA 2018). National Wetland Map 5 includes inland wetlands and estuaries, associated with river line data and many other data sets within the South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018).

A single wetland type was identified by means of this dataset namely depression wetlands. Three wetlands were identified within the project area of influence (PAOI) which includes the Mirach Solar PV Project development area. The condition of the wetlands was classified as being A/B (Largely Natural) and with an ecological thread status of least concern and a protection level of poorly protected (see Figure 7.21).

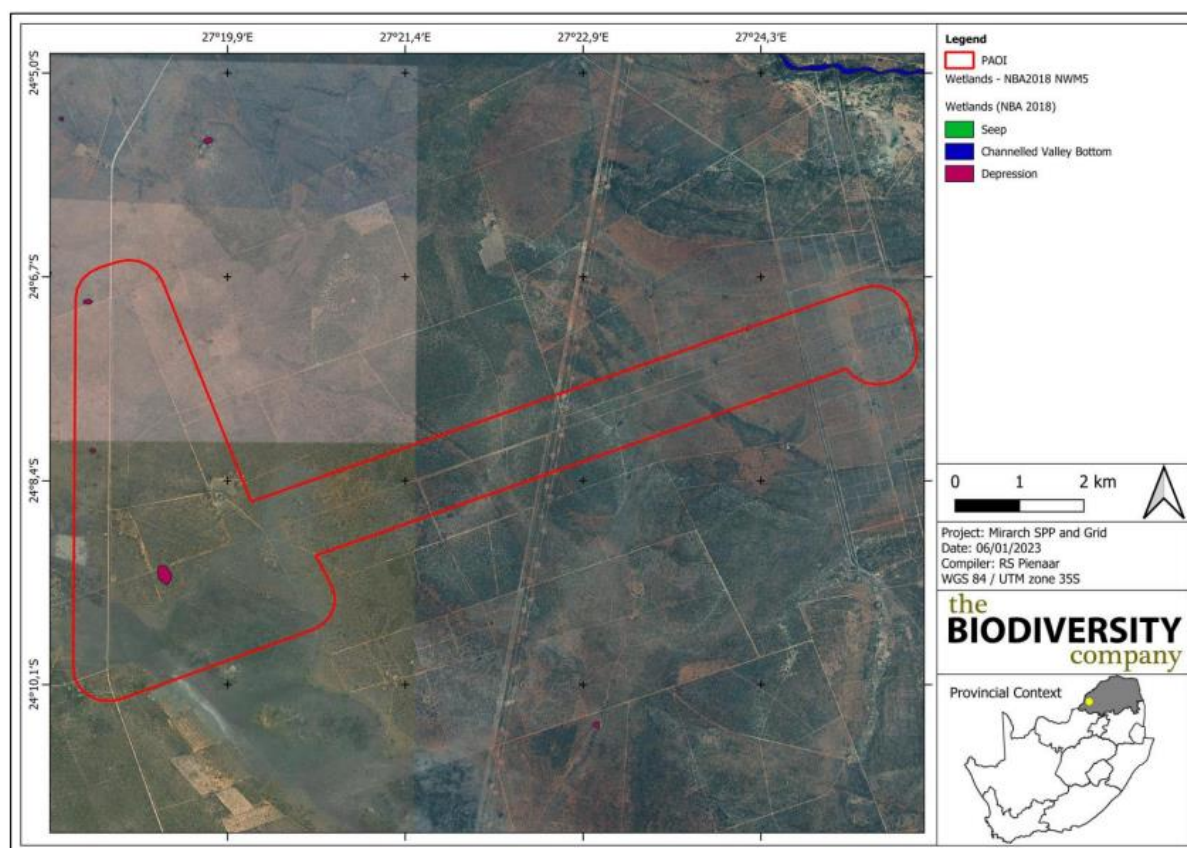


Figure 7.21: SAIIE wetlands located within the project area of influence.

7.7.2 National Freshwater Ecosystem Priority Areas (NFEPA) Wetlands

Three wetlands have been identified within the project area of influence; these wetlands are classified as being depression wetlands. The wetlands are classified as largely natural (see Figure 7.22).

7.7.3 Topographical Inland Water and River Lines

The topographical inland and river line data for "2529" quarter degree was used to identify potential wetland areas within the project area of influence. This dataset indicates multiple inland water areas of which were classified as being dams and marsh vlei's as well as perennial and non-perennial river lines located within the project area of influence (see Figure 7.23).

The terrain of the project area of influence has been analysed to determine potential areas where water is more likely to accumulate (due to convex topographical features, preferential pathways, or more gentle slopes).

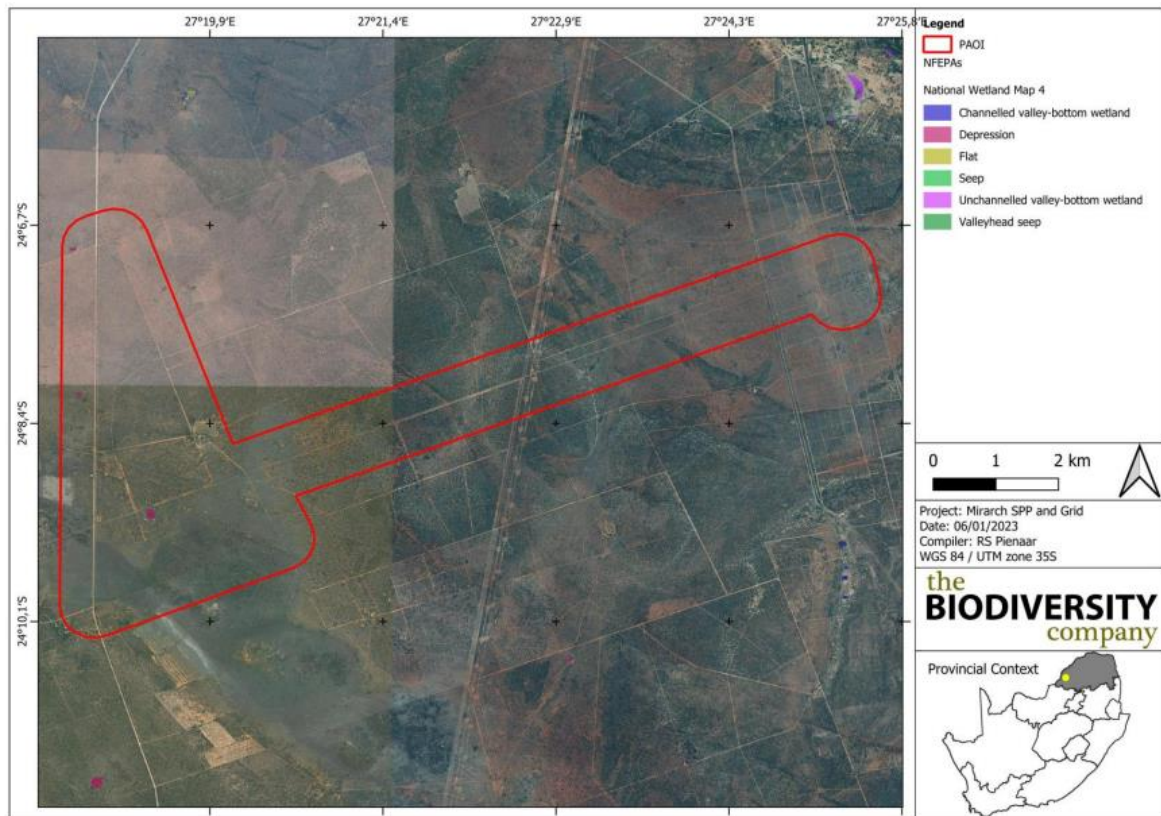


Figure 7.22: NFEPA wetlands located within the project area of influence.

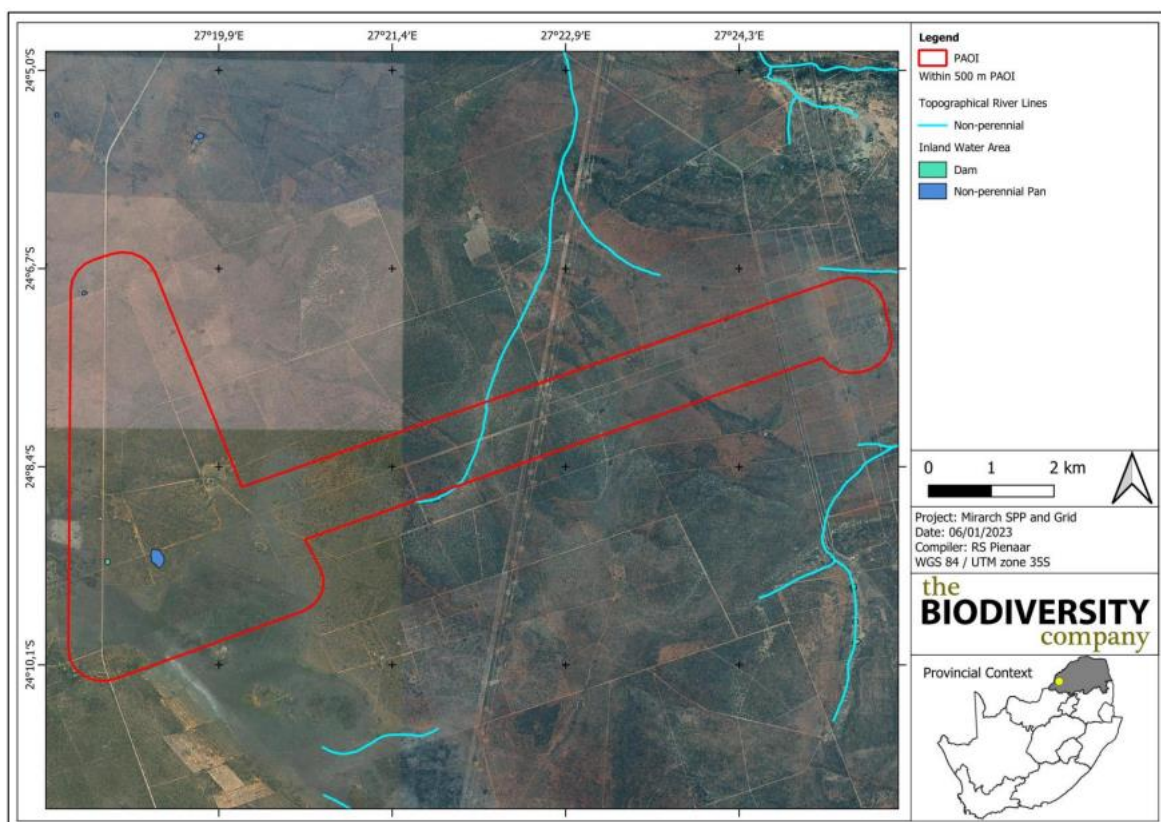


Figure 7.23: Topographical river line and inland wetland areas located within the project area of influence.

7.7.4 Field Assessment Results

The different wetland types were identified and delineated during the field assessment in accordance with the Department of Water and Sanitation guidelines and recommended suitable buffer zones (DWA, 2008), and available satellite imagery.

Two hydrogeomorphic (HGM) units were identified within the 500 m regulated area (i.e. the project area of influence, namely, HGM 1 - Depression and HGM 2 - Depression, as well as a few off-channel artificial dams. Although these dams are not natural systems it is still important to note where they are and to preserve them due to the role these dams play. Refer to Figure 7.24 and Figure 7.25.

Depression wetlands are located on the "slope" landscape unit. Depressions are inward draining basins with an enclosing topography which allows for water to accumulate within the system. Depressions, in some cases, are also fed by lateral sub-surface flows in cases where the dominant geology allows for these types of flows.

The ecosystem services provided by the wetlands identified within the development area were assessed and rated using the WET-EcoServices method. Overall, HGM 1 scored a "moderately high" ecosystem services score and HGM 2 "Intermediate" for ecosystem services.

HGM 1 was classified as a depression wetland which is known for its ability to act as a sink to remove toxicants from the environment and store it within the depression. Although the two HGM units are of the same wetland type HGM unit 1 scored ecosystem services score was high due to the fact the HGM unit was covered in vegetation which plays an important role in the assimilation of nitrates, phosphates and toxicants from the environment. The HGM unit also plays an important role in providing habitat for species as well as providing resources for both humans and animals.

HGM unit 2 scored "intermediate" ecosystem services score due to the fact that the depression will act as a sign for the environment but does not have high vegetation cover to assimilate the toxicant out of the environment. The HGM unit does however provide resources during the rainy season and will keep water in the environment into the dry months. The depressions will also provide habitat to species during the rainy season.

The Present Ecological Status (PES) of the wetlands present have been considered. The overall present ecological state of the different HGM units were rated as ranging between

“Largely Modified” (class D) and “Seriously Modified” (class E), which indicates a large degree of modification. The main modifications to the wetlands are to the hydrology of the wetlands due to modifications in the wetlands catchments as well as some modifications inside the wetlands themselves. Modifications to the catchments of the HGM units consists of development of dirt roads that compress the soils and increase the runoff of water into the HGM units. The modification to the wetlands catchments causes an increase in waterflow during the rainy season which leads to a modification in wetlands function. The increase in subwater flows due to the modification to the wetlands catchments has formed some channels within the HGM units that may lead to erosion and the loss of sediment within the wetlands.

The wetlands have also undergone modification to their vegetation cover due to the construction of roads within the wetland as well as grazing of game. There are also multiple alien invasive plant species present within the wetland which will out compete the natural hydrophytes if left unattended. Alien invasive plants take up a lot of space as well as large volumes of water making the habitat less suitable for hydrophytes that play an important role in wetlands function. Hydrophytes are important to help prevent erosion and sedimentation and they help provide clean water for the downstream areas.

The Importance and Sensitivity (IS) Assessment for all the wetlands have been calculated to be “Low”, which combines the relatively low threat status and the low protection levels of the wetland.

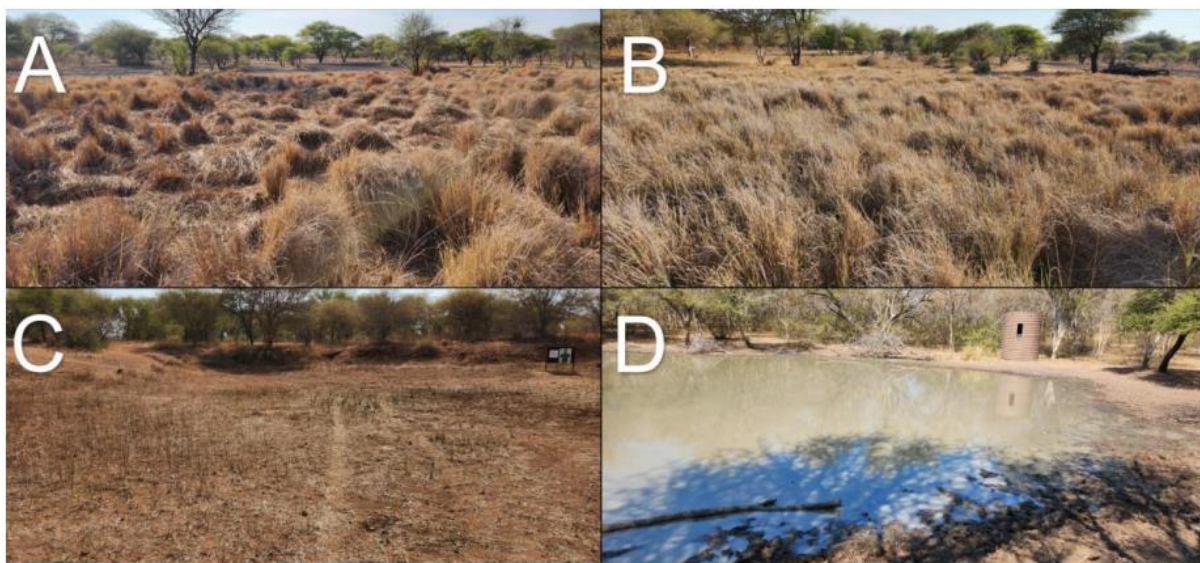


Figure 7.24: Photographical evidence of wet areas located within the project area of influence (A and B – depression wetlands, C and D – Artificial Dams).

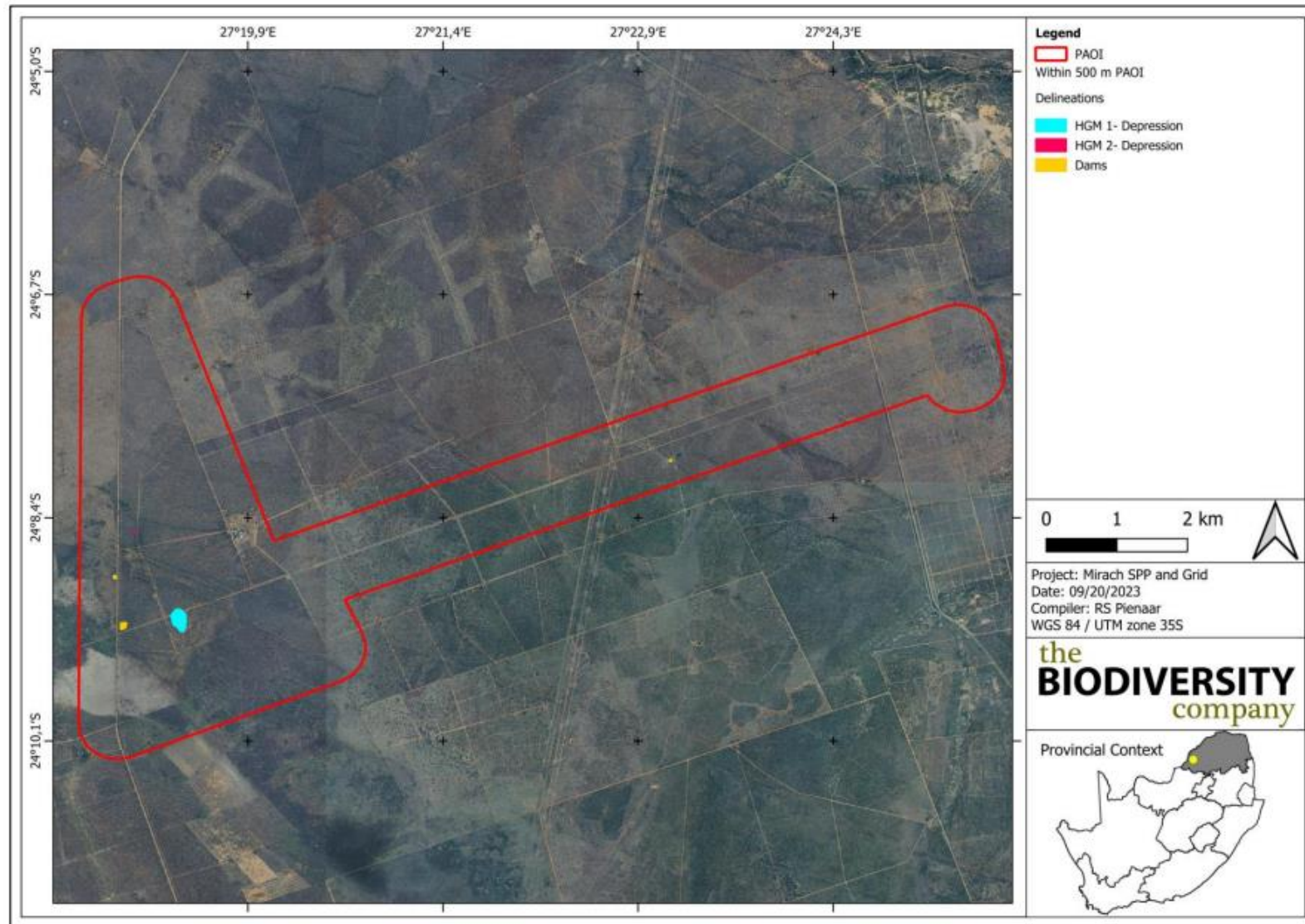


Figure 7.25: Delineation of wetlands present within the project area of influence.

7.8 Avifauna Assessment

An Avifauna Impact Assessment (Appendix E3) has been undertaken for the Mirach Solar PV Project. Two site visits were conducted for this regime 2 assessment. The first was conducted in Autumn, over 4 days with 1 observer from the 5th to the 8th of May 2023, and the second, during late winter, over 5 days from the 14th to the 17th of August 2023. These two site visits are considered sufficient from a seasonal perspective and require no additional season assessment.

7.8.1 Important Bird and Biodiversity Areas

Important Bird & Biodiversity Areas (IBAs) are the sites of international significance for the conservation of the world's birds and other conservation significant species as identified by BirdLife International. These sites are also all Key Biodiversity Areas; sites that contribute significantly to the global persistence of biodiversity (BirdLife South Africa, 2017).

The project area of influence does not overlap with any IBA but is approximately 20 km away from the Waterberg System IBA. Refer to Figure 7.26 below.

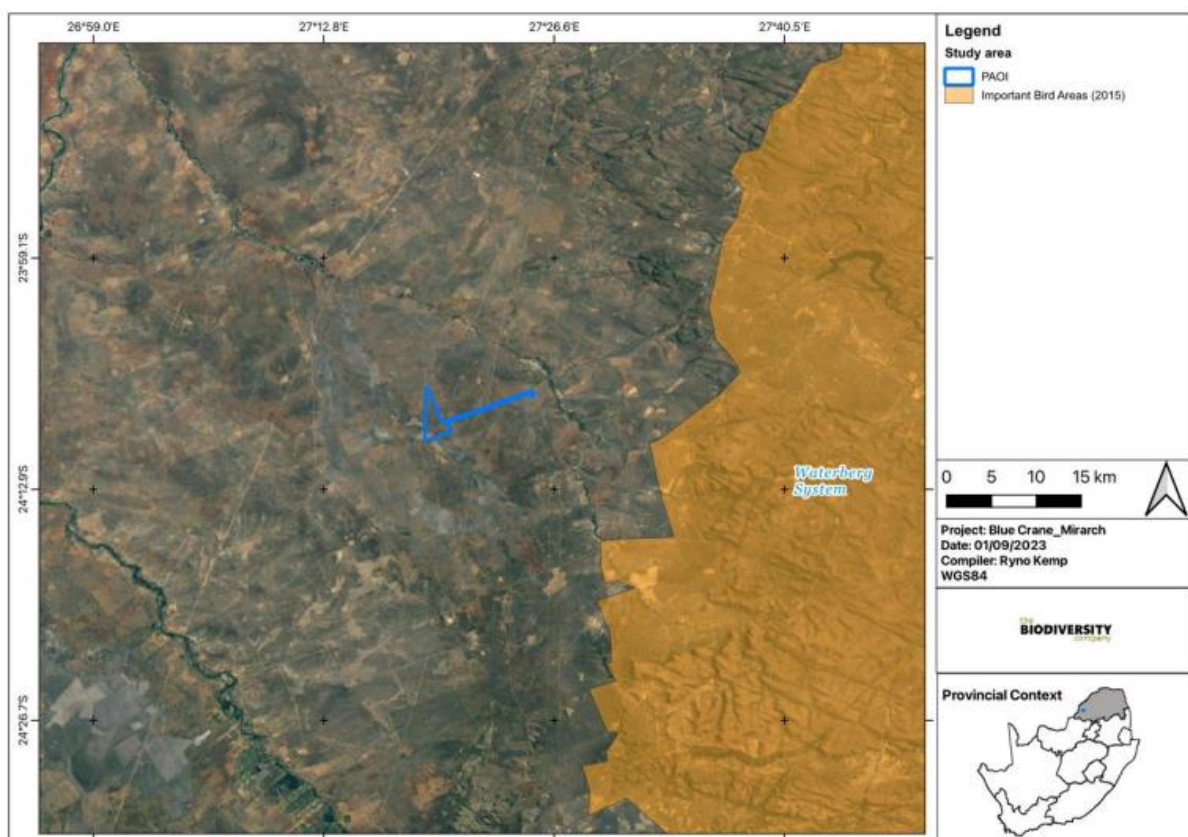


Figure 7.26: The location of Important Bird and Biodiversity Areas proximal to the project area of influence.

7.8.2 Expected Species of Conservation Concern (SCC)

The SABAP2 Data lists 278 indigenous avifauna species that could be expected to occur within the PAOI and surrounding landscape. Nine of these expected species are regarded as SCC. Refer to Table 7.4, as well as the descriptions that follow.

Table 7.4: Expected avifauna Species of Conservation Concern that are expected to occur within the project area of influence. *CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

Scientific Name	Common Name	Regional*	Global+	Likelihood of Occurrence
<i>Ciconia abdimii</i>	Abdim's Stork	NT	LC	Low
<i>Coracias garrulus</i>	European Roller	NT	LC	High
<i>Falco biarmicus</i>	Lanner Falcon	VU	LC	High
<i>Nettapus auritus</i>	African Pygmy Goose	VU	LC	Low
<i>Polemaetus bellicosus</i>	Martial Eagle	EN	EN	Moderate
<i>Sagittarius serpentarius</i>	Secretarybird	VU	EN	Low
<i>Torgos tracheliotos</i>	Lappet-faced Vulture	EN	EN	Moderate
<i>Gyps coprotheres</i>	Cape Vulture	EN	VU	Confirmed
<i>Gyps africanus</i>	African White-backed Vulture	CR	CR	Confirmed

- *Coracias garrulous* (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas (IUCN, 2017).
- *Falco biarmicus* (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). They may occur in groups up to 20 individuals, but have also been observed solitary. Their diet is mainly composed of small birds such as pigeons and francolins.

- *Gyps africanus* (White-backed Vulture) has a large range and only occurs throughout sub-Saharan Africa. Primarily a lowland species of open wooded savanna, particularly areas of Acacia (*Vachellia*). It requires tall trees for nesting. According to the IUCN (2017) this species faces similar threats to other African vultures, being susceptible to habitat conversion to agro-pastoral systems, loss of wild ungulates leading to a reduced availability of carrion, hunting for trade, persecution and poisoning.
- *Gyps coprotheres* (Cape Vulture) is listed as Endangered (EN) on both a regional and global scale. Cape Vultures are long-lived carrion-feeders specialising on large carcasses, they fly long distances over open country, although they are usually found near steep terrain, where they breed and roost on cliffs (IUCN, 2017).
- *Polemaetus bellicosus* (Martial eagle) is listed as EN on a regional scale and VU on a global scale. This species has an extensive range across much of sub-Saharan Africa, but populations are declining due to deliberate and accidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (IUCN, 2017). It inhabits open woodland, wooded savanna, bushy grassland, thorn-bush and, in southern Africa, more open country and even sub-desert (IUCN, 2017).
- *Torgos tracheliotus* (Lappet-faced Vulture) is listed as EN, both on a regional and global level. Only a small, very rapidly declining population remains, owing primarily to poisoning and persecution, as well as ecosystem alterations (IUCN, 2017). The species inhabits dry savanna, arid plains, deserts and open mountains. It ranges widely when foraging and is mainly a scavenger, feeding predominantly on any large carcasses or their remains.

7.8.3 Results of the Field Surveys

Two site visits were conducted for this regime 2 assessment. The total number of individual species accounts for approximately 37.1% of the total number of expected species.

Two SCC (Cape Vulture (*Gyps coprotheres*) and African White-backed Vulture (*Gyps africanus*)) were recorded within and outside the project area of influence during the survey period within point counts and incidental records.

7.8.3.1 Risk Species

Priority Species are considered threatened, rare or prone to impacts from energy development. Nine (9) species observed within the project area of influence are considered priority species. Refer to Table 7.5 below.

Table 7.5: Summary of priority species recorded within and around the Mirach Solar PV Project and the risks posed by energy development for these species.

Common Name	Scientific Name	Sources	Collision	Electrocution	Disturbance / Habitat Loss
Black-winged Kite	<i>Elanus caeruleus</i>	X	X	X	
Red-crested Korhaan	<i>Lophotis ruficrista</i>	O	X		X
Cape Vulture	<i>Gyps coprotheres</i>	X	X	X	X
Black-chested Snake Eagle	<i>Circaetus pectoralis</i>	X	X	X	X
Gabar Goshawk	<i>Micronisus gabar</i>	O	X		X
Brown Snake Eagle	<i>Circaetus cinereus</i>	X	X	X	X
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	X	X	X	X
White-backed Vulture	<i>Gyps africanus</i>	X	X	X	X
African Hawk Eagle	<i>Aquila spilogaster</i>	X	X	X	X

7.8.3.2 Dominant Species

The most abundant species was the *Streptopelia capicola* (Ring-necked Dove), with a relative abundance of 0.137 and a frequency of occurrence of 55.435% (Table 7.6). Additional ubiquitous species was *Passer diffusus* (Southern Grey-headed Sparrow). No distinct seasonal differences were observed.

Table 7.6: Relative abundance and frequency of occurrence of dominant avifauna species recorded.

Common Name	Scientific Name	Relative abundance	Frequency
Ring-necked Dove	<i>Streptopelia capicola</i>	0.137	55.435
Southern Grey-headed Sparrow	<i>Passer diffusus</i>	0.062	20.652
Burchell's Starling	<i>Lamprotornis australis</i>	0.049	20.652
Southern Red-billed Hornbill	<i>Tockus rufirostris</i>	0.041	13.043
White-browed Scrub Robin	<i>Cercotrichas leucophrys</i>	0.039	25.000
Blue Waxbill	<i>Uraeginthus angolensis</i>	0.036	15.217
Southern Yellow-billed Hornbill	<i>Tockus leucomelas</i>	0.032	17.391
Arrow-marked Babbler	<i>Turdoides jardineii</i>	0.032	6.522
Rattling Cisticola	<i>Cisticola chiniana</i>	0.030	17.391
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	0.028	17.391
Chinspot Batis	<i>Batis molitor</i>	0.028	19.565
Crimson-breasted Shrike	<i>Laniarius atrococcineus</i>	0.025	16.304
Magpie Shrike	<i>Urolestes melanoleucus</i>	0.022	8.696
Southern Pied Babbler	<i>Turdoides bicolor</i>	0.022	4.348
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>	0.022	6.522
Lilac-breasted Roller	<i>Coracias caudatus</i>	0.019	10.870
Green Wood Hoopoe	<i>Phoeniculus purpureus</i>	0.019	5.435
Long-billed Crombec	<i>Sylvietta rufescens</i>	0.017	9.783
White-browed Sparrow-Weaver	<i>Plocepasser mahali</i>	0.017	7.609
Helmeted Guineafowl	<i>Numida meleagris</i>	0.014	3.261

7.8.3.3 Flight and Nest Analysis

Observing and monitoring flight paths and nesting sites of SCC and/or priority species are important in ascertaining habitat sensitivity and evaluating the impact risk significance of any proposed development. Flight analysis is also important for species that exhibit diel movement between roosting and foraging sites to prevent the risk of collision with infrastructure. A very condensed version of flight path analysis was done, the aim of this was to determine if there is a general direction of most birds on site.

No specific flight paths were noted.

No confirmed nest sites of SCC have been recorded during the field investigation within the Mirach Solar PV Project project area of influence and the development area.

7.8.3.4 Fine-Scale Habitat Identification

The main habitat types identified across the project area of influence were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four habitats were delineated in total. Refer to Table 7.7 and Figure 7.27

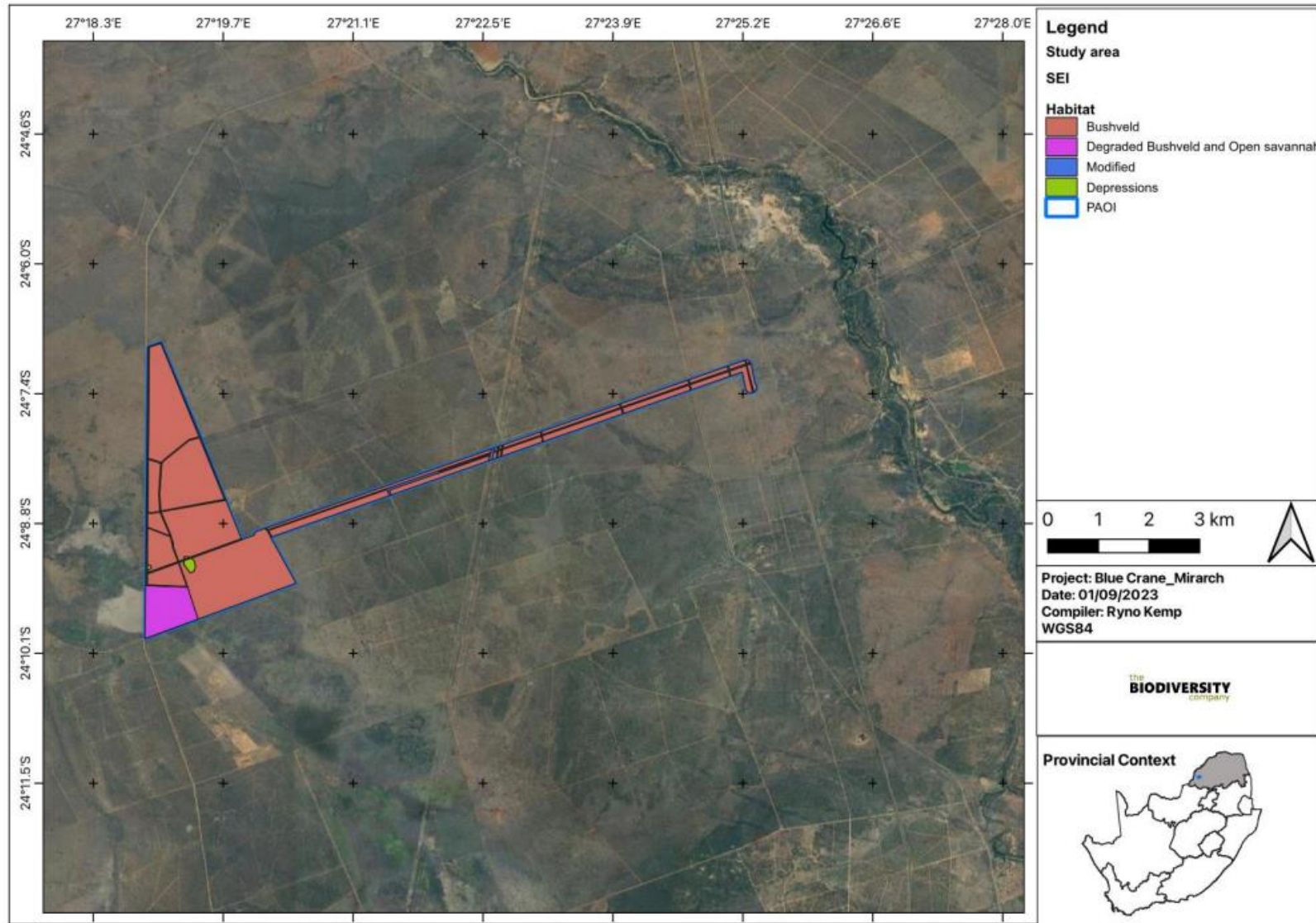






Figure 7.27: Habitat types delineated within the project area of influence.

Table 7.7: Fine-Scale Habitats identified from an avifauna perspective.

Habitat, Description and SCC possibly occurring	Photograph
Habitat (Dam) SCC: <i>Ciconia abdimii</i> , <i>Nettapus auritus</i> - very low likelihood	
Bushveld (Bushveld system) SCC: <i>Falco biarmicus</i> , <i>Gyps africanus</i> , <i>Polemaetus bellicosus</i> , <i>Sagittarius serpentarius</i> , <i>Coracias garrulus</i> , <i>Aquila rapax</i>	
Grassland and savannah systems with some evidence of past or current agricultural activities SCC: <i>Falco biarmicus</i> , <i>Gyps africanus</i> , <i>Polemaetus bellicosus</i> , <i>Sagittarius serpentarius</i> , <i>Coracias garrulus</i> , <i>Aquila rapax</i>	
Modified (homesteads and associated infrastructure as well as prominent roads and disturbed areas) SCC: None	

7.9 Visual Consideration

Visual impacts occur when changes in the landscape are noticeable to viewers looking at the landscape from their homes or from parks and conservation areas, highways and travel routes, and important cultural features and historic sites.

7.9.1 Visual Features and Sensitive Receptors

According to the Visual Impact Assessment (Appendix E5), it is possible that landscape change due to the proposed development could impact the character of an important landscape area.

Importance can be derived from specific features that can relate to urban or rural settings. They might include key natural, historic or culturally significant elements. Importance might also relate to landscapes that are uncommon or under threat from development.

7.9.1.1 Visual Features

The landscape character is a composite of several influencing factors namely, landform and drainage, vegetation patterns and nature and density of development.

- Landform and Drainage: The Mirach Solar PV Project is situated in a region of relatively low elevation. This indicates that the project is not situated atop an elevated landform, at the base of such a feature, or in a location with significant changes in elevation. The closest prominent elevated landforms are situated approximately 25km east of Mirach Solar PV Project, at the commencement of the Waterberg Mountain range.
- Vegetation Patterns: The vegetation and landscape features can be described as Plains with a layer of scattered, low to medium high, deciduous microphyllous trees and shrubs with a few broad-leaved tree species, and an almost continuous herbaceous layer dominated by grass species.
- Nature and Density of Development: Development within a 10km radius of the Mirach Solar PV Project can be divided into the following types:
 - *Industrial Development* – No industrial development could be located within the 10km radius. The nearest industrial development is mining activity around Thabazimbi.
 - *Urban Development* – None within the 10km radius. An informal settlement is located just outside the 10km radius approximately 10.3km south of the Mirach Solar PV Project.
 - *Sports and Recreational Development* – No sports developments within the 10km radius. The area surrounding the site is known for hunting which can also be seen as recreational.
 - *Agricultural Development* – This is one of the main development types in the area consisting mostly of cattle and game farming.
 - *Service Development* – Facilities and infrastructure associated with development. These developments are almost limited to roads and power infrastructure only.
 - *Tourism Development* - The proposed development is situated in a serene Bushveld setting that is renowned for its tranquillity. The area is a popular destination for tourists who are drawn to hunting and the complete safari experience. Additionally, the region also attracts international hunters seeking an authentic African hunting experience.

7.9.1.2 Visual Receptors

Visual Receptors can be defined as: "Individuals, groups or communities who are subject to the visual influence of a particular project".

Possible sensitive visual receptors are located within a 10km radius which is based on use of the landscape and can therefore be sensitive to change. The following receptors have been identified:

Area Receptors which include:

- Elizabeth Private Nature Reserve.
- Matlabas Private Nature Reserve.
- Nuwe Hoop Private Nature Reserve.
- Rooiboschbult Private Nature Reserve.
- Sonnerus Private Nature Reserve.
- Kastrol Private Nature Reserve.
- Next Door Private Nature Reserve.
- Safari No 1 Private Nature Reserve.

Linear Receptors which include:

- Inkerman secondary road.
- Matjesfontein secondary road.
- Private aerodromes.

Point Receptors which include:

- Homesteads on farms.
- Lodging facilities.

7.9.2 Zone of Theoretical Visibility (ZTV) Model

A Zone of Theoretical Visibility (ZTV) is a Geographic Information System (GIS)-generated tool to identify the likely (or theoretical) extent of visibility of a development. The ZTV maps reflects the visibility in term of proximity of viewers to the proposed development within a 10 km radius. The Visual Exposure rating within the different radii are as follows: Refer to Table 7.8.

Table 7.8: ZTV Exposure Rating

Distance (km)	Exposure Rating
0-1	Very High Exposure
1-3	High Exposure
3-5	Medium Exposure
5-10	Low Exposure

Table 7.9 and Table 7.10 below reflects the results of the ZTV exposure for the Mirach Solar PV Project. The tables provide the visibility ratings in terms of proximity on sensitive receptors for the solar energy facility and grid connection corridor.

Table 7.9: ZTV Visibility Rating in terms of proximity to the Mirach Solar PV Project

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	<ul style="list-style-type: none"> - Four homesteads on farms of which one is the owner's home of the property where the proposed development will be located - Inkerman secondary road adjacent to site - Rooiboschbult Private Nature Reserve also the landowner's property - Oom Karel Private Nature Reserve <p>Visibility Coverage: 75.87%</p>	Very High
1-3km	<ul style="list-style-type: none"> - Six homesteads on farms - Inkerman secondary road - Rooiboschbult Private Nature Reserve - Oom Karel Private Nature Reserve <p>Visibility Coverage: 31.81%</p>	High
3-5km	<ul style="list-style-type: none"> - Four homesteads on farms - Rooiboschbult Private Nature Reserve - Inkerman secondary road - Nuwe Hoop Private Nature Reserve 	Medium

	Visibility Coverage: 11.27%	
5-10km	<ul style="list-style-type: none"> - Nine homesteads on farms - One lodging facility - One private aerodrome - Nuwe Hoop Private Nature Reserve - Sonnerus Private Nature Reserve - Elizabeth Private Nature Reserve 	Low
	Visibility Coverage: 6.9%	

Table 7.10: ZTV Visibility Rating in terms of proximity to the grid connection corridor

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	<ul style="list-style-type: none"> - One homestead on a farm - Rooiboschbult Private Nature Reserve - Oom Karel Private Nature Reserve - Matjesfontein secondary road <p>Visibility Coverage: 96.38%</p>	Very High
1-3km	<ul style="list-style-type: none"> - Ten homesteads on farms - Matjesfontein secondary road - Inkerman secondary road - Rooiboschbult Private Nature Reserve - Oom Karel Private Nature Reserve <p>Visibility Coverage: 62.47%</p>	High
3-5km	<ul style="list-style-type: none"> - 7 homesteads on farms - Inkerman secondary road - Matjesfontein secondary road - Elizabeth Private Nature Reserve - Kastrol Private Nature Reserve <p>Visibility Coverage: 48.98%</p>	Medium
5-10km	<ul style="list-style-type: none"> - 25 homesteads on farms - One lodging facility - One private aerodrome - Inkerman secondary road - Matjesfontein secondary road 	Low

	<ul style="list-style-type: none"> - Elizabeth Private Nature Reserve - Nuwe Hoop Private Nature Reserve - Sonnerus Private Nature Reserve - Matlabas Private Nature Reserve - Kastrol Private Nature Reserve - Safari No 1 Private Nature Reserve <p>Visibility Coverage: 38.7%</p>	
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It must be noted that the ZTV assessment did not consider existing screening such as buildings and vegetation cover but rather the terrain’s above mean sea level (AMSL) which indicates line of sight.

Figure 7.28 and Figure 7.29 indicate the results of the ZTV of the solar energy facility and the grid connection corridor.

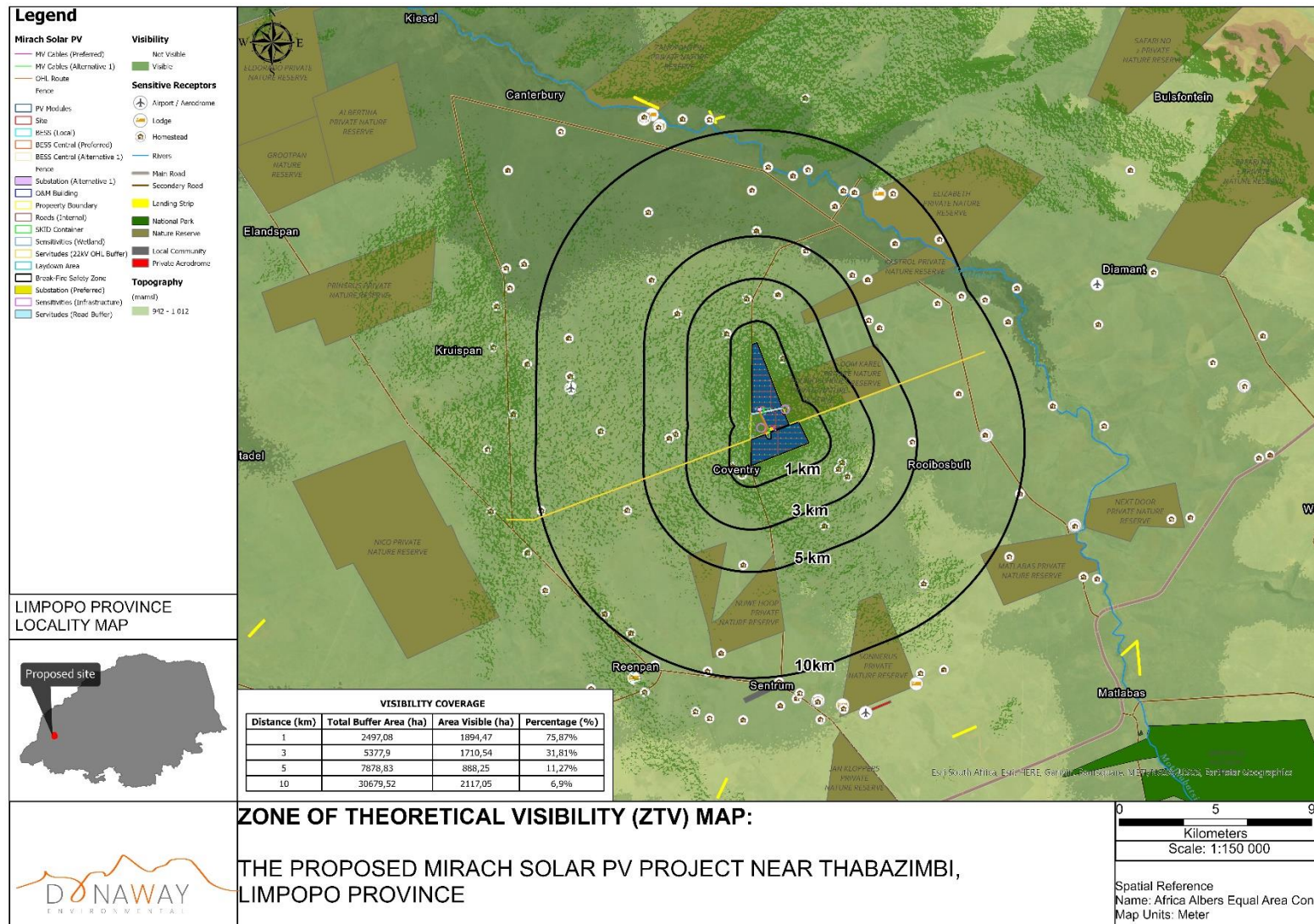


Figure 7.28: Zone of Theoretical Visibility of the Mirach Solar PV Project.

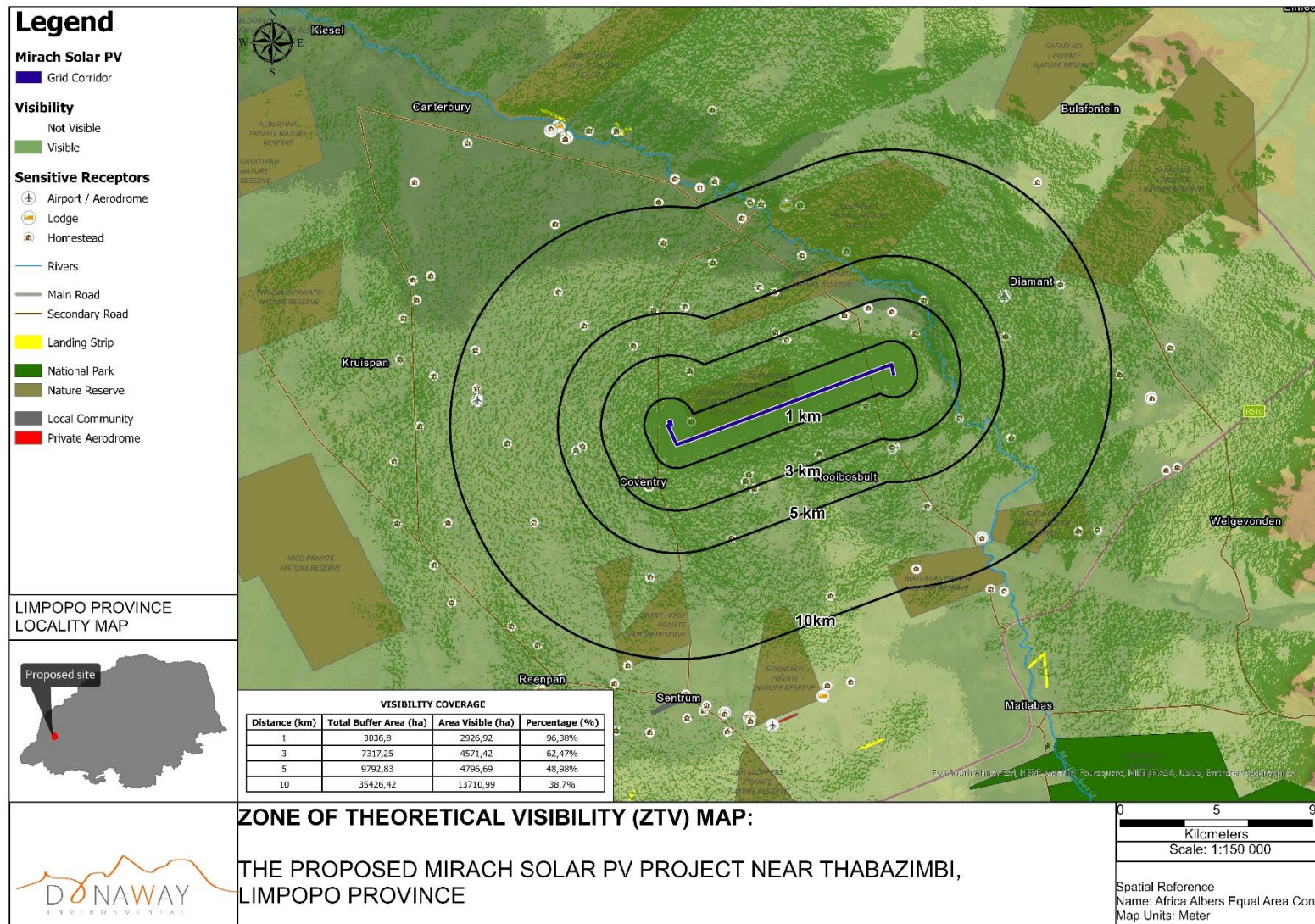


Figure 7.29: Zone of Theoretical Visibility of the Mirach Solar PV Project grid connection corridor

7.10 Cultural Heritage Aspects

The aim of the Heritage Impact Assessment (HIA) (Appendix E7) was to survey the proposed development area to understand the cultural layering of the area, and if heritage features are found, to assess their importance within local, provincial, and national context. The HIA further served to assess the impact of the proposed project on non-renewable heritage resources.

A Palaeontological Desktop Assessment (Appendix E8) was also undertaken to understand the palaeontological resources present within the Mirach Solar PV Project development area.

7.10.1 Cultural Landscape Qualities

The cultural landscape qualities of the region essentially consist of a rural setup. In this the human occupation is made up of a pre-colonial element consisting of Stone Age occupation and Late Iron Age occupation, as well as a much later colonial (farmer) component, which eventually gave rise to a number of towns and associated infrastructure developments. The following qualities are relevant to the cultural landscape:

Stone Age

The larger Waterberg region is rich in heritage sites. Stone Age people have settled in the area since Early Stone Age times. Most sites are in the open, located in the vicinity of water sources, e.g. Wadley et al (2016). The same holds true for the Middle Stone Age occupation. During the Late Stone Age human population increased and, in a departure from previous periods, they preferred to occupy rock shelters which were occupied either in a cyclical manner or were re-occupied after a period of absence. During the Later Stone Age people also produced a rich legacy in rock art found in many of these shelters.

Iron Age

Iron Age people started to enter the area by the 8th century in limited numbers. They preferred to settle close to rivers, using the rich alluvial soils to cultivate for their crops. These villages were generally large, with the homestead spread out, covering in some cases areas of up to as much as 400 x 400 metres.

During the 1980s, sites dating to the Early Iron Age have been identified by Jan Aukema all along the Matlabas River, west of the project, but nothing located more than a kilometre or two away from the river. This indicated how dependent these early farmer communities were

on available open water as well as the alluvial soils in the vicinity or river to grow their various crop plants.

However, it was only by the middle of the 17th century that Late Iron Age people started to enter the area in large numbers. Some of the earliest groups were Nguni-speakers, probably the ancestors of the Ndebele-speakers still living in the larger region, mostly to the east. They were somewhat later followed by the various Sotho-Tswana-speakers. As this was a period of stress and uncertainty, the people used to aggregate in compact stone walled villages located in easily defensible positions on hilltops (Boeyens et al 2009; Hall 1985; Van Schalkwyk 2005).

During this time the rich mineral wealth of the area was also exploited: tin was mined at Rooiberg, iron was mined and smelted all over, especially in the region of Thabazimbi and specularite south of Thabazimbi. Although the iron and specularite was used locally, the tin was probably all exported via the East Coast.

Historic Period

By the early 19th century early European travellers started to enter the region, including Thomas Baines, David Hume, Cornwallis Harris and David Livingstone. Early voortrekkers such as Louis Trichardt and J van Rensburg also visited the area (Walker & Bothma 2005). But, by the late 19th century, white settlers also arrived on the scene, taking farms. However, for long the area was seen as a conservative backcountry area of the country (Vig 2018). This is certainly the case, as is evidenced by the well-known South African itinerant painter, Eric Mayer, who painted numerous scenes of Waterberg people using ox-wagons on hunting trips or to travel to town to attend Nagmaal at the church, camping along the way in tents as late as the 1940s.

Early on the area was surveyed and subdivided into farms. Several small towns were soon laid out, followed by the necessary infrastructure development. After the Second South African War (1899- 1902), farmers from all over the old ZAR were encouraged to settle in the region and take up farms. This also was exploited by the new British controlled government who brought in a class of 'yeoman' British farmers who would displace the Boer farmers as the primary economic force in the countryside. It also presented possibilities to the land companies to unload large tracts of land onto the market (Trapido 1978:50). Johannes Rissik, Surveyor-General of the ZAR was also director of the Transvaal Land and Exploration Company who owned several farms in the larger countryside, surely benefitted from this.

The Oceana Consolidated Company Limited one of the first early major South African Mining Houses, based in Johannesburg. It owned over 1 million acres of gold and other Mineral Rights in the South African Republic (ZAR), later the Transvaal Province. Early maps give a clear indication of the large number of farms in the Waterberg region on which this company held the mineral rights. Other companies such as the Transvaal Consolidated Land & Exploration Company Limited and the African and European Investment Company owned equally large mining rights in the region.

7.10.2 Resources Identified within the Development Area

From a review of the available old maps and aerial photographs it can be seen that the area within which the Mirach Solar PV Project is proposed has always been open space, with the main activity being grazing and limited agricultural fields. Up until 1889 development in the region was rather slow.

During the site visit undertaken by the independent specialist no sites, features or objects of cultural significance dating to the Stone Age, Iron Age and historic period were identified.

7.10.3 Palaeontological Resources

The south western corner of the Mirach Solar PV Project is underlain by Quaternary alluvium while the rest is underlain by diabase and the Nylstroom Subgroup of the Waterberg Group. According to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS) the Palaeontological Sensitivity of Quaternary sands is Moderate, while that of the Waterberg Group is Low, and that of the diabase is Zero (Almond and Pether, 2009; Almond et al., 2013, Groenewald et al 2014). Updated Geology (Council of Geosciences) refined the geological map and indicate that the proposed development is underlain by alluvium, colluvium, elluvium and gravel as well as diabase and the Aasvoëlkop Formation of the Matlabas Subgroup (Waterberg Group).

A Low Palaeontological significance has thus been allocated to the development.

7.11 Concluding Statement

From an environmental perspective the development footprint proposed within the assessed development area is considered highly desirable in terms of geology, vegetation and landscape features, climate, biodiversity and the visual landscape with minimal confirmed

environmental sensitivities which can easily be avoided through the careful placement of infrastructure considering the features and associated buffers (where relevant).

The area proposed for development consists of agriculture (natural grazing and historical crop areas), with limited wetland and heritage features present, and where these are present these have been avoided by the design of the development footprint.

A sensitivity analysis is included in section 10 of this report which provides specific feedback regarding the sensitivity of the identified environmental features and provides an indication of whether the Applicant has considered these features (and their associated buffers) as part of the placement of the development footprint within the development area.

7.12 Legal Requirements Complied with in Section 7 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(h)(iv) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including (iv) the environmental attributes associated with the development footprint focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	This chapter provides a description of the environment that may be affected by the placement of the development footprint within the development area. The information is provided in order to assist the reader in understanding the receiving environment and features of the biophysical, social, and economic environment that could be directly or indirectly affected by, or alternatively could impact on, the proposed development. This chapter was supplemented by research of existing available information; information gathered from on-site investigations and as received from various specialist investigations. Copies of the specialist

	assessment reports are attached as Appendix E.
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8 IMPACT ASSESSMENT

The development of the Mirach Solar PV Project has the potential to impact on the affected environment within which the project is proposed (as fully described in section 7). This section of the draft EIA Report assesses the impacts and issues that may arise due to the development. Furthermore, identification of appropriate mitigation measures and the effectiveness of the measures on the impacts in terms of significance reduction is also indicated.

To appropriately identify, assess and, as far as possible, avoid or mitigate potential impacts and risks that may be associated with the construction, operation and decommissioning of the Mirach Solar PV Project, Blue Crane Environmental commissioned a team of independent specialists with relevant knowledge and expertise in the biophysical (i.e., biotic and abiotic) and socio-economic environments. Input was sought from the following specialist fields through the provision of independent specialist reports:

- Terrestrial Ecology Baseline and Impact Assessment (including plant and animal species) – refer to Appendix E1
- Wetland Baseline and Risk Assessment – refer to Appendix E2
- Avifauna Impact Assessment– refer to Appendix E3
- Soils and Agricultural Compliance Statement – refer to Appendix E4
- Visual Impact Assessment – refer to Appendix E5
- Social Impact Assessment – refer to Appendix E6
- Heritage Impact Assessment (including archaeology and the cultural landscape) – refer to Appendix E7
- Palaeontological Desktop Assessment – refer to Appendix E8

When considering the development of solar PV facilities, the IFC's Project Developer's Guide to Utility-Scale Solar Photovoltaic Power Plants (2015), identifies potential environmental impacts and risks. The main impacts are listed below:

- Construction phase impacts, such as temporary air emissions (dust and vehicle emissions), noise, solid waste and wastewater generation, and OHS issues such as the risk of preventable accidents leading to injuries and / or fatalities.

- Water usage, such as the cumulative water use requirement in arid areas where local communities rely upon scarce groundwater resources.
- Land matters, such as land acquisition procedures and in particular involuntary land acquisition / resettlement.
- Landscape and visual impacts, such as the visibility of the project within the wider landscape and associated impacts on landscape designations, character types and surrounding communities.
- Ecology and natural resources, such as habitat loss / fragmentation, impacts on designated areas and disturbance or displacement of protected or vulnerable species.
- Cultural heritage, such as impacts on the setting of designated sites or direct impacts on below-ground archaeological deposits as a result of ground disturbance during construction.
- Transport and access, such as impacts associated with the transportation of materials and personnel on project-affected communities.
- Drainage / flooding, such as the potential for high flood risk associated with the site.

The impacts identified by the independent specialists for the Mirach Solar PV Project are discussed in the sections below. Impacts are assessed for the construction, operation and decommissioning phases as relevant. It must be noted that the impacts are assessed in terms of the draft development footprint proposed by the Applicant.

8.1 Assessment of Impacts and Issues

The impacts and issues are assessed below per specialist field.

8.1.1 Impacts on Terrestrial Biodiversity

The project activities associated with the Mirach Solar PV Project will have a negative effect on the natural environment of the area. Considering the current anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the site. These include:

- Overgrazing by livestock;
- Historical land clearing and land use;
- Roads and associated vehicle traffic; and
- Presence of fences.

The proposed clearance and levelling for the infrastructure during construction may physically remove vegetation as well as remove and fragment communities/ ecosystems for terrestrial plant species. This will result in direct and indirect erosion due to the loss of soil/vegetation cover. This will increase the potential for the establishment of alien and invasive vegetation; disruption in natural areas of phytomass, disturbance of soil and introduction by humans due to human movements will increase the potential and likelihood of establishment of alien and invasive vegetation.

The proposed clearance and levelling will result in the direct loss of habitat forcing fauna species (including confirmed SCC) to move into new areas where more challenges may be present. Disruption of faunal populations by interfering with their movements and/or breeding activities. Direct mortalities from earth moving or transport vehicles and increased traffic due to construction work and the transportation of staff/materials. The unregulated movement of local people will also increase the likelihood of poaching of species in what was previously seen as secluded habitat for fauna species. The unregulated movement of local people could lead to introduction of diseases and feral species such as cats and dogs.

During the operational phase, further spread of alien invasive plants will take place, as well as the deterioration of the habitats due to the increase of dust and edge effect impacts. Due to the vegetation communities that were cleared within the proposed development footprint during the construction phase being entirely transformed, indirect impacts to the surrounding vegetation communities and ecosystems are the main impacts considered. The edges of the infrastructure will likely be degraded by impacts such as dust (reduces the effectiveness of photosynthesis and pollination), livestock and alien vegetation will become a concern in these disturbed areas. The unregulated movement of local people into the areas surrounding the footprint will likely result in plant poaching.

Ongoing displacement due to sensory disturbance during operation (noise, light, traffic, dust, pollution and vibrations) from the earth moving machinery and generators is a major impact to consider. The area will likely be impacted by poaching, mortality, litter and introduction of diseases and feral species such as cats, vermin and dogs due to the increase in human presence as the operations continue.

During the decommissioning phase, the operational phase impacts will persist until the activity reduces and the rehabilitation measures are implemented. Impacts regarding this phase may be detrimental as well as beneficial to the vegetation communities/ ecosystems depending on the extent and effort of the rehabilitation measures.

Rehabilitation efforts and removal of all unnatural structures, slopes and materials will result in conditions for potential re-establishment of vegetation communities/ ecosystems and the associated fauna resulting in reinstating the land capability.

More details pertaining to the impacts of the development are discussed below.

Construction Phase Impacts

Three main impacts on the terrestrial biodiversity of the site have been considered for the construction phase of the proposed activities. This phase refers to the period during construction when the proposed features are constructed; and is considered to have the largest direct impact on biodiversity. Due to the presence of flora SCC, as well as development within a CBA1 and CBA 2, a high impact is expected. The following potential impacts to terrestrial biodiversity were considered, and these are each assessed for their significance in Tables 8.1 – 8.3 that follows:

1. Destruction, further loss and fragmentation of habitats, ecosystems and vegetation community (including SCC);
2. Spread and/or establishment of alien and/or invasive species; and
3. Displacement of faunal community (including SCC) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration).

Operation Phase Impacts

Dust generation and other environmental pollution due to water runoff will have a direct effect on the habitat and its function. Faunal species will be displaced, and ecological life cycles altered. The pre-mitigation risk is expected to be Very High but can be reduced to a moderate residual significance with the implementation of the prescribed mitigation measures. The impact ratings of the impacts are included in Tables 8.4 – 8.6.

1. Continued encroachment and displacement of the natural vegetation community due to alien invasive plant species, dust, erosion and edge effects;
2. Continued displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration, and blasting, including the disruption/alteration of ecological life cycles; and
3. Fencing of PV area and associated impacts to fauna.

When considering the terrestrial impact assessment undertaken for the Mirach Solar PV Project all impacts associated with the construction phase are either of a high and medium significance prior to the implementation of the recommended mitigation measures. However, with implementation of the measures the impact significance is reduced to medium and low with no impact expected to be of a high significance.

All impacts during the operational phase will be of a medium significance before mitigation and can be reduced to either a medium or low significance with the implementation of the recommended mitigation measures.

Therefore, from a terrestrial impact perspective it is confirmed that the Mirach Solar PV Project will not result in unacceptable high impact which cannot be mitigated.

It must be noted that the mitigation measures included provide the main / key measures recommended, however all measures are included in the EMPr.

Table 8.1: Destruction, loss and fragmentation of habitats during Construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Destruction, loss and fragmentation of the habitats, ecosystems and vegetation community, including protected species, due to vegetation clearance	Before mitigation	Negative	2	4	3	3	4	4	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	1	2	2	2	2	3	3	26	Medium (29-50)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Demarcation and avoidance of the sensitive habitats must be done by using safety tape to ensure a known barrier is present that may not be crossed. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. • If possible Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both fossorial and epigenic biodiversity (Bennun et al, 2021). If concrete foundations are used that would increase the impact of the project as there would be direct impacts to soil permeability and characteristics, thereby influencing inhabitant fauna. In addition, stormwater runoff and runoff from cleaning the panels would be increased, increasing erosion in the surrounding areas. • Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). • Vegetation clearing to commence only after the necessary permits have been obtained. • Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities. • Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. 													

Table 8.2: Alien vegetation introduction during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Introduction of alien species, especially plants	Before mitigation	Negative	3	4	3	3	4	3	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	1	1	1	1	1	1	1	6	Low (6-28)		

<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Compilation of and implementation of an alien vegetation management plan for the development footprint. The development footprint of the construction should be kept to a minimum. • The development footprint must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. • The footprint of the roads must be kept to prescribed widths. • Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the likely presence of Species of Conservation Concern. 												
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Table 8.3: Faunal impacts during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching)	Before mitigation	Negative	2	4	4	2	4	3	3	57	High (51-73)	Yes	Yes
	After mitigation	Negative	1	2	1	2	2	2	2	20	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • A qualified environmental control officer must be appointed prior to the commencement of construction. • A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any SSC should be noted and permits obtained for. • In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. • In the above mentioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. • Should animals not move out of the area on their own the relevant specialists must be contacted to advise on how the species can be relocated. The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments. Signs must be put up to enforce this. 													

Table 8.4: Continued alien vegetation encroachment during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Continued encroachment and displacement of the natural vegetation	Before mitigation	Negative	2	3	2	4	2	3	3	48	Medium (29-50)	Yes	Yes

community due to alien invasive plant species, dust, erosion and edge effects	After mitigation	Negative	1	2	1	3	2	2	2	22	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Demarcation and avoidance of the sensitive habitats must be done by using safety tape or signage to ensure a known barrier is present that may not be crossed. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species. • If possible solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both fossorial and epigenic biodiversity (Bennun et al, 2021). If concrete foundations are used that would increase the impact of the project as there would be direct impacts to soil permeability and characteristics, thereby influencing inhabitant fauna. In addition, stormwater runoff and runoff from cleaning the panels would be increased, increasing erosion in the surrounding areas. • Indigenous vegetation must be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). • Vegetation clearing to commence only after the necessary permits have been obtained. • Environmental Officer (EO) / operations manager to provide supervision and oversight of vegetation clearing activities where undertaken as part of maintenance activities. • Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. 													

Table 8.5: Continued displacement of fauna during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Continued displacement and direct mortalities of faunal community (including SCC) due to disturbance (road collisions, noise, light, dust, vibration and blasting), including the disruption/alteration of ecological life cycles	Before mitigation	Negative	2	4	2	3	2	3	3	50	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	1	1	2	1	2	16	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the above mentioned situation the development of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. 													

- The areas to be maintained during operation must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments. Signs must be put up to enforce this.

Table 8.6: Pollution during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Environmental pollution due to water runoff	Before mitigation	Negative	2	3	3	3	2	3	2	32	Medium (29-50))	Yes	Yes
	After mitigation	Negative	1	1	1	1	2	1	1	7	Low (6-28)		
Mitigation Measures:													
<ul style="list-style-type: none"> • Waste management must be a priority and all waste must be collected and stored effectively. 													

8.1.2 Impacts to Wetlands

The impact assessment has considered both direct and indirect impacts, if any, to wetland systems. The specialist has undertaken two separate risk assessments, one for the Mirach Solar PV project and one for the associated grid connection corridor.

It must be noted that the risk assessments undertaken are in accordance with General Notice (GN) 509 of 2016 as it relates to the NWA (1998). Therefore, the impact assessment as per the Impact Assessment Methodology (section 5.3), is not relevant to wetlands.

Some of the risks to the wetlands in relation to the Mirach Solar PV Project are expected to be moderate (pre-mitigation) but can be reduced to low with adherence to the mitigation measures provided.

The risk assessment for the grid connection corridor indicates that the pre-mitigation risk rating will be moderate due to the corridor intersecting the wetland. However, for the power line avoidance of the wetland is possible by taking care of where the pylons of the power line will be located, preferably out of the wetland buffer, where possible. Although the risks will be minimised with the placement of the pylons outside of the wetland buffers the power line will still be pulled through the wetlands and some direct as well as indirect impacts will occur on the wetlands.

In terms of the buffers recommended by the specialist, it is stated that a pre-mitigation buffer zone for the PV development of 30 m is recommended for the identified wetlands, which can be decreased to 15 m with the addition of all prescribed mitigation measures recommended by the specialist. The pre-mitigation buffer zone pertaining to the power line was calculated at 24 m, which can be decreased to 15 m with the addition of all the prescribed mitigation measures.

Specific impacts have been identified and assessed below for the construction, operation and decommissioning phases. These impacts include:

Construction Phase Impacts

- Direct disturbance / degradation / loss to wetland soils or vegetation due to the construction.
- Increased erosion and sedimentation.
- Potential contamination of the wetlands with machine oils and construction materials.
- Disturbance and degradation of wetland vegetation.

- Increased bare surfaces, runoff and potential for erosion.
- Introduction and spread of alien invasive vegetation.
- Increased sediment loads to downstream reaches.
- Contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment and vehicles as well as contamination and eutrophication of wetland systems with human sewerage and litter.

Operation Phase Impacts

- Potential for increased stormwater runoff leading to increased erosion and sedimentation.
- Potential for increased contaminants entering the wetland systems.
- Degradation of wetland vegetation.
- Proliferation of alien and invasive species.

Decommissioning Phase Impacts

- Potential loss or degradation of nearby wetlands through inappropriate closure.
- Degradation of wetland vegetation and proliferation of alien and invasive species.
- Increased bare surfaces, runoff and potential for erosion.

Table 8.7 provides the risk assessment associated with the Mirach Solar PV Project and Table 8.8 provides the risk assessment associated with the grid connection corridor.

When considering the risk assessment undertaken for the Mirach Solar PV Project and the grid connection corridor all impacts / risks associated with the development are either of a medium or low significance prior to the implementation of the recommended mitigation measures. With implementation of the measures the impact / risk significance is reduced to low with no impact expected to be of a high or medium significance.

Therefore, from a wetland impact perspective it is confirmed that the Mirach Solar PV Project will not result in unacceptable high impact which cannot be mitigated.

Based on the results of the risk assessment, the specialist has recommended that a general authorisation will be required in terms of the National Water Act.

Table 8.7: Wetland Risk Assessment Matrix for the Mirach Solar PV Project (GN 509).

Activity	Aspect	Impact	Mitigation	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Total											
Construction																			
Site clearing and preparation.	Wetland disturbance / loss.	Direct disturbance / degradation / loss to wetland soils or vegetation due to the construction of the solar facility.	Without	3	1	3	3	2.5	2	3	7.5	3	4	1	2	9	75	M	<ul style="list-style-type: none"> Clearly demarcate the construction footprint and restrict all construction activities to within the proposed infrastructure area. When clearing vegetation, allow for some vegetation cover as opposed to bare areas. Minimize the disturbance footprint and the unnecessary clearing of vegetation outside of this area. Use the wetland shapefiles to signpost the edge of the wetlands closest to site. Place the sign 15 m from the edge (this is the buffer zone). Label these areas as environmentally sensitive areas, keep out. Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the overall master plan. All activities (including driving) must adhere to the 15 m buffer area. Promptly remove / control all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. All alien vegetation along the transmission servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. By this Eskom is obliged to control.
			With	2	1	2	2	1.75	2	3	6.75	3	3	1	1	8	54	L	

Activity	Aspect	Impact	Mitigation	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Total											
Water runoff from construction site.	Increased erosion and sedimentation.	Without		3	3	3	3	3	1	5	9	2	2	1	2	7	63	M	<ul style="list-style-type: none"> • Landscape and re-vegetate all denuded areas as soon as possible.
		With		2	2	1	1	1.5	1	2	4.5	3	2	1	1	7	31.5	L	<ul style="list-style-type: none"> • Limit construction activities near (< 50m) wetlands to winter (as much as possible) when rain is least likely to wash concrete and sand into the wetland. Activities in black turf soils can become messy during the height of the rainy season and construction activities should be minimised during these times as far as possible to minimise unnecessary soil disturbances. • Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. • No activities are permitted within the wetland and associated buffer areas. • Landscape and re-vegetate all unnecessarily denuded areas as soon as possible.
	Potential contamination of wetlands with machine oils and construction materials.	Without		1	2	2	2	1.75	1	2	4.75	3	3	1	2	9	42.75	L	<ul style="list-style-type: none"> • Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.
		With		1	1	1	1	1	1	2	4	1	2	1	2	6	24	L	<ul style="list-style-type: none"> • Appropriately stockpile topsoil cleared from the project area. • Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g.

Activity	Aspect	Impact	Mitigation	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Total											
Operation																			
Operation of the solar facility.	Hardened surfaces.	Potential for increased stormwater runoff leading to Increased erosion and sedimentation.	Without	2	2	2	2	2	3	2	7	3	3	1	2	9	63	M	<ul style="list-style-type: none"> • Design and implement an effective stormwater management plan. • Promote water infiltration into the ground beneath the solar panels. • Release only clean water into the environment. • Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g. slabs of concrete with rocks cemented in). • Re-vegetate denuded areas as soon as possible. • Regularly clear drains. • Minimise the extent of concreted / paved / gravel areas. • A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving. • Avoid excessively compacting the ground beneath the solar panels.
			With	1	1	1	1	1	2	2	5	1	2	1	1	5	25	L	
	Contamination.	Potential for increased contaminants entering the wetland systems.	Without	2	2	2	2	2	3	2	7	3	3	1	2	9	63	M	
			With	1	1	1	1	1	2	2	5	1	2	1	1	5	25	L	

Activity	Aspect	Impact	Mitigation	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Total											
Decommissioning																			
Decommissioning of the solar facility.	Rehabilitation.	Potential loss or degradation of nearby wetlands through inappropriate closure.	Without	2	2	3	2	2.3	2	3	7.3	3	3	1	1	8	58	M	<ul style="list-style-type: none"> Develop and implement a rehabilitation and closure plan. Appropriately rehabilitate the project area by ripping, landscaping and re-vegetating with locally indigenous species.
			With	1	1	1	1	1	2	2	5	1	2	1	1	5	25	L	

Table 8.8: Wetland Risk Assessment Matrix for grid connection corridor (GN 509).

Activity	Aspect	Impact	Mitigation Scenario	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity											
Construction																			
Clearing and preparation of power line route including storage of equipment	Wetland vegetation deterioration and soil exposure.	Disturbance and degradation of wetland vegetation	Without	1	1	1	1	1	2	1	4	1	2	1	1	5	20	L	<ul style="list-style-type: none"> Restrict the disturbance and clearance footprint to within 5 m on either side of the power line route (31 m disturbance corridor). Avoid wetlands and buffers where feasible. Implement a rehabilitation plan for any disturbed wetlands. Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer areas. Although the prescribed post-mitigation buffer as per the national buffer determination tool is 15 m attempt wherever possible to maintain a 33 m buffer on the delineated wetlands to lower the
			With	1	1	1	1	1	2	1	4	1	2	1	1	5	20	L	

Activity	Aspect	Impact	Mitigation Scenario	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity											
																			potential for bird collisions which are highest near water resources. <ul style="list-style-type: none"> • Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the identified drainage lines. • Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas.
		Increased bare surfaces, runoff and potential for erosion	Without	2	2	2	2	2	2	6	3	3	1	1	8	48	L	<ul style="list-style-type: none"> • Keep tower base excavation and soil heaps neat and tidy. • Limit construction activities in proximity (< 50 m) to wetlands to the dry season if possible when storms are least likely to wash concrete and sand into wetlands. This is only where towers are within wetlands and buffer areas. 	
			With	1	1	1	1	1	2	2	5	3	1	1	1	6	30	L	<ul style="list-style-type: none"> • Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. • Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished. • Limit the placement of towers within wetlands and buffer areas where feasible. • Do not situate any of the construction material laydown areas within any wetland or buffer area. Try adhere to a 15 m buffer in these instances. • No machinery should be allowed to parked in any wetlands or buffer areas.

Activity	Aspect	Impact	Mitigation Scenario	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	
				Flow Regime	Water Quality	Habitat	Biota	Severity												
		Introduction and spread of alien and invasive vegetation	Without	1	1	3	3	2	1	2	5	3	3	5	1	12	60	M	<ul style="list-style-type: none"> Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed. Limit soil disturbance. The use of herbicides is not recommended in or near wetlands (opt for mechanical removal). Appropriately stockpile topsoil cleared from the power line footprint. Clearly demarcate power line construction footprint, and limit all activities to within this area. Minimize unnecessary clearing of vegetation beyond the tower footprints and power line corridor. Lightly till any disturbed soil around the tower footprint to avoid compaction. 	
			With	1	1	2	1	1.25	1	2	4.25	3	1	1	1	6	26	L		
Excavation, levelling and installation of transmission towers.	Soil disturbance, sedimentation	Increased sediment loads to downstream reaches	Without	2	2	2	2	2	2	2	6	3	3	1	1	8	48	L	<ul style="list-style-type: none"> See mitigation for increased bare surfaces, runoff and potential for erosion. Re-instate topsoil and lightly till power line tower disturbance footprint. 	
			With	1	1	1	1	1	1	2	4	3	1	1	1	6	24	L		
		Contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles as well as Contaminatio	Without	2	3	2	2	2.25	2	2	2	6.25	3	3	1	1	8	50	L	<ul style="list-style-type: none"> Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility. Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering wetland or buffer areas.
			With	1	3	1	1	1.5	2	2	2	5.5	3	1	1	1	6	33	L	

Activity	Aspect	Impact	Mitigation Scenario	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures
				Flow Regime	Water Quality	Habitat	Biota	Severity											
		n and eutrophication of wetland systems with human sewerage and litter.																	<ul style="list-style-type: none"> Mixing of concrete must under no circumstances take place within the wetland or buffer areas. Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter. Provide appropriate sanitation facilities for workers during construction and service them regularly. The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility. The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility.
Operation																			
Routine operation and maintenance of power line route	Clearing of wetland vegetation beneath power line	Degradation of wetland vegetation wetland vegetation.	Without	1	1	1	3	1.5	2	1	4.5	3	1	5	1	10	45	L	<ul style="list-style-type: none"> Clear vegetation in line with the 2010 Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead power line servitudes". Avoid the use of herbicides and diesel to treat stumps within the wetland and buffer areas. Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas.
			With	1	1	1	23	6.5	2	1	9.5	3	1	5	1	10	95	L	

Activity	Aspect	Impact	Mitigation Scenario	Severity					Spatial scale	Duration	Consequence	Frequency of activity	Frequency of impact	Legal Issues	Detection	Likelihood	Significance	Risk Rating	Control Measures	
				Flow Regime	Water Quality	Habitat	Biota	Severity												
	Alien and Invasive species	Proliferation of alien and invasive species	Without	1	1	3	4	2.25	2	2	6.25	3	1	5	1	10	63	M	<ul style="list-style-type: none"> In line with the 2010 Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead power line servitudes" all alien vegetation along the transmission servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. By this Eskom is obliged to control category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas. 	
			With	1	1	1	4	1.75	2	1	4.75	3	1	5	1	10	48	L		
Decommissioning																				
Removal of transmission towers and lines	Vehicle access	Degradation of wetland vegetation and proliferation of alien and invasive species	Without	2	2	2	3	2.25	1	2	5.25	3	1	5	1	10	53	L	<ul style="list-style-type: none"> See mitigation for the impacts on direct loss, disturbance and degradation of wetlands and spread of alien and invasive plants. Control should continue for a minimum of three years following decommissioning. 	
			With	1	1	2	3	1.75	1	2	4.75	3	1	5	1	10	48	L		
	Re-excavation of Transmission Towers	Increased bare surfaces, runoff and potential for erosion	Without	2	2	2	2	2	2	2	2	6	3	3	1	1	8	48	L	<ul style="list-style-type: none"> See mitigation for increased bare surfaces, runoff and potential for erosion and increased sediment loads during construction.
			With	1	1	1	1	1	2	2	2	5	3	1	1	1	6	30	L	

8.1.3 Impacts on Avifauna

Impacts to avifauna have been assessed against the data captured during the fieldwork and from a desktop evaluation. In consideration that there are anthropogenic activities and influences present within the landscape, there are several negative impacts to biodiversity, including avifauna. These include:

- Grazing by livestock;
- Power lines;
- Invasive Alien Plants and weeds;
- Erosion;
- Secondary roads and main roads (and associated traffic and wildlife road mortalities); and
- Fences.

When considering the construction and operation of the Mirach Solar PV Project it has been indicated that during construction vegetation clearing for the associated infrastructure will lead to direct habitat loss. Vegetation clearing will create a disturbance and will therefore potentially lead to the displacement of avifaunal species. The operation of construction machinery on site will generate noise pollution. Increased human presence can lead to poaching and the increase in vehicle traffic and heavy machinery will potentially lead to roadkill.

The principal impacts of the operational phase are electrocution, collisions, fencing, chemical pollution due to chemical cleaning of the PV panels and habitat loss. Solar panels have been implicated as a potential risk for bird collisions, as well as overhead power line infrastructure.

Large passerines are particularly susceptible to electrocution because owing to their relatively large bodies, they are able to touch conductors and ground/earth wires or earthed devices simultaneously. The chances of electrocution are increased when feathers are wet, during periods of high humidity or during defecation. Prevailing wind direction also influences the rate of electrocution casualties.

Fencing of the PV site can influence birds in six ways (BirdLife South Africa, 2015):

- Snagging – occurs when a body part is impaled on one or more barbs or razor points of a fence;
- Snaring – when a bird’s foot/leg becomes trapped between two overlapping wires;
- Impact injuries – birds flying into a fence, the impact may kill or injure the bird;

- Snarling – when birds try and push through a mesh or wire stands, ultimately becoming trapped (uncommon);
- Electrocutation – electrified fence can kill or severely injure birds; and
- Barrier effect – fences may limit flightless birds including moulting waterfowl from resources.

Chemical pollution from PV cleaning, if used and if not environmentally friendly, will result in either acute or chronic effects. Should this chemical penetrate the surrounding environment, it would impact populations on a larger scale and not just species found in and around the PV footprint.

The proposed activities associated with the Mirach Solar PV Project are likely to be of a medium to high impact, and the careful placement of the development and activities is therefore important to minimise the damage to natural resources. Any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- Critical Biodiversity Area 1 if a great area than the project area of influence is cleared;
- Wetland areas providing valuable foraging and nesting resources;
- Important ecological corridors; and
- Foraging and traversing routes, and/or nesting sites, relevant to the wide diversity of fauna that will make use of certain areas.

As the majority of the site is in a functional state, the loss of these resources would be considered significant. Therefore, mitigations must be put in place and implemented to prevent the total destruction of valuable natural resources.

The impact assessment undertaken by the independent specialist for the Mirach Solar PV Project assesses impacts expected during the construction, operation and decommissioning phases.

The results of the assessment indicate that during the construction, operation and decommissioning phases impacts may be of high or medium significance, depending on the impact under consideration, and with the implementation of the recommended mitigation measures the impact significance will be reduced to either low or medium. However, one impact of a high significance will remain however the specialist indicates that the impact would still be considered acceptable and is not a fatal flaw. Majority of impacts can be reduced to an appropriate level of significance with the implementation of the recommended mitigation measures and therefore the development is considered to be appropriate. Tables 8.9-8.21 provide the results of the avifauna impact assessment.

Table 8.9: Vegetation clearance during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Vegetation clearance as part of the construction phase activities	Before mitigation	Negative	2	4	2	3	3	2	3	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	4	2	2	2	1	2	24	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Demarcation and avoidance of the riparian area must be done by using safety tape or signage to ensure a known barrier is present that may not be crossed. • If Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both fossorial and epigenic biodiversity (Bennun et al, 2021). If concrete foundations are used that would increase the impact of the project as there would be direct impacts to soil permeability and characteristics, thereby influencing inhabitant fauna. In addition, stormwater runoff and runoff from cleaning the panels would be increased, increasing erosion in the surrounding areas. • If possible, indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). • Vegetation clearing to commence only after the necessary permits have been obtained. • The Environmental Officer (EO) must provide supervision and oversight of vegetation clearing activities. • Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. 													

Table 8.10: Habitat destruction during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Destruction, degradation and fragmentation of surrounding habitats	Before mitigation	Negative	2	4	2	4	3	2	3	51	High (51-73)	Yes	Yes
	After mitigation	Negative	1	1	1	1	1	1	1	6	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Pre -construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc. • All solid waste must be managed in accordance with a Solid Waste Management Plan. Recycling is encouraged. 													

- All construction activities and roads to be within the clearly defined and demarcated areas.
- Temporary laydown areas must be clearly demarcated and rehabilitated with indigenous vegetation subsequent to end of use.
- Appropriate dust control measures to be implemented.
- Suitable sanitary facilities to be provided for construction staff as per the guidelines in Health and Safety Act.
- Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.
- All hazardous materials, if any, must be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.

Table 8.11: Displacement during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Destruction, degradation and fragmentation of surrounding habitats	Before mitigation	Negative	2	4	2	2	2	2	3	42	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	4	2	2	1	2	26	Low (6-28)			
Mitigation Measures:													
<ul style="list-style-type: none"> • Construction activity should be restricted, where possible, to daylight hours, as nocturnal species are highly dependent on sound and/or vocalisations for behavioural processes. However, low impact and low noise construction activities with minimal light might be considered during nighttime. • All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. • If generators are to be used these must be soundproofed. Reduce the decibel level of a generator by 15-30 decibels, or as per the SANS standards. 													

Table 8.12: Mortality due to persecution during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Direct mortality from persecution or poaching of avifauna species and collection of eggs	Before mitigation	Negative	2	3	2	2	2	2	3	39	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	1	1	2	1	1	1	8	Low (6-28)		
Mitigation Measures:													

- All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs.
- Prior to commencing work each day, two individuals should traverse the working area, if possible, in order to disturb any avifauna and so they have a chance to vacate the area.
- Any avifauna threatened by the construction activities that do not vacate the area should be removed safely by an appropriately qualified environmental officer or removal SACNASP registered avifauna specialist.

Table 8.13: Mortality due to vehicle operation during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Direct mortality from increased vehicle and heavy machinery traffic	Before mitigation	Negative	2	3	3	3	2	2	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	2	1	2	1	1	10	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • All personnel must undergo environmental induction with regards to awareness about speed limits and roadkill. • All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. 													

Table 8.14: Collision with infrastructure during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Collisions with infrastructure associated with the Mirach Solar PV Project	Before mitigation	Negative	2	3	4	4	4	3	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	2	3	4	4	4	2	3	57	High (51-73)		
Mitigation Measures: <p><u>Solar mitigations:</u></p> <ul style="list-style-type: none"> • Post-construction monitoring should follow the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). If monitoring results indicate excessive bird fatalities, then adaptive mitigations should be implemented. Before implementation, these should be discussed with the avifaunal specialist and could include the retrofitting/incorporation of additional visual cues/diverters to existing PV panels/infrastructure. 													

Fencing mitigations:

- Top 2 strands must be smooth wire.
- Routinely retention loose wires.
- Minimum distance between wires is 300 mm, if possible.
- Place markers on fences to increase visibility. Place every 15 m.

Power line mitigations:

- The design of the proposed grid connection must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.
- The air space used by the gridlines /tie in lines must be minimised by placing them underground as far as possible.
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. Place pylons and associated infrastructure along existing infrastructure, where possible (e.g. roads, other power lines).
- The power line should be marked with bird diverters along the entire line in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that Blue Crane mortality was reduced by 92% (95% confidence interval [CI]: 77–97%) and all large birds by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted along the entire length of the overhead line. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites. The devices must be placed at sections of high risk to be determined by an avifauna specialist prior to construction.

Table 8.15: Electrocutation during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Electrocutation with infrastructure associated with the Mirach Solar PV Project	Before mitigation	Negative	1	2	3	3	3	2	3	42	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	3	3	3	3	1	3	42	Medium (29-50)		

Mitigation Measures:

- The design of the proposed grid connection must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.
- Insulation where energised parts and/or grounded parts are covered with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered.
- Perch discouragers must be used such as perch guards or spikes. Considerable success achieved by providing artificial bird safe perches, which are placed at a safe distance from the energised parts (Prinsen et al, 2012).

Table 8.16: Direct mortality during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Electrocution with infrastructure associated with the Mirach Solar PV Project	Before mitigation	Negative	2	3	3	3	2	2	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	1	2	3	1	2	20	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting avifauna species and collecting eggs. • Signs must be put up to enforce this. Should someone be caught, an appropriate fine must be enforced. • All personnel must undergo environmental induction with regards to awareness about speed limits and roadkill. • All vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. 													

Table 8.17: Pollution during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Pollution of water sources and surrounding habitat due to cleaning products of the solar panels	Before mitigation	Negative	2	3	3	3	3	2	3	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	1	2	2	1	2	20	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • Only environmentally friendly chemicals are to be used for cleaning of the panels. 													

Table 8.18: Heat radiation during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Heat radiation from the Battery Energy Storage System (BESS) and solar panels	Before mitigation	Negative	1	2	3	3	3	2	3	42	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	1	1	1	1	1	1	6	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • The BESS must be enclosed in a structure with a non-reflective surface. • A fire management plan needs to be put in place. • Existing vegetation should be kept under the panels to ensure that additional reflection is not taking place from the surface below the panels. 													

Table 8.19: Alien vegetation encroachment during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Encroachment of Invasive Alien Plants into disturbed areas	Before mitigation	Negative	2	4	3	4	4	2	3	57	High (51-73)	Yes	Yes
	After mitigation	Negative	1	1	2	2	3	1	2	20	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • An Invasive Alien Plant (IAP) Management Plan must be written and implemented for the development. The developer must contract a specialist to develop the plan and the developer is responsible for its implementation. • All IAP species must be removed/controlled using the appropriate techniques as indicated in the IAP management plan. 													

Table 8.20: Direct mortality during decommissioning.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Encroachment of Invasive Alien Plants into disturbed areas	Before mitigation	Negative	2	3	3	3	2	2	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	2	1	1	1	1	8	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • All personnel should undergo environmental awareness training including educating about not harming or collecting avifauna species. • Prior to commencing work each day, two individuals should traverse the working area, if possible, in order to disturb any avifauna and so they have a chance to vacate. • Any avifauna threatened by the maintenance activities must be removed safely by an appropriately qualified environmental officer or removal specialist. • All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. • All hazardous materials, if any, must be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner. • All infrastructure must be removed if the facility is decommissioned. • The development footprint must be rehabilitated, and a management plan must be in place to ensure that it is done successfully to restore the avifauna community and their associated habitat. 													

Table 8.21: Continued habitat degradation during decommissioning.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Continued habitat degradation due to Invasive Alien Plant encroachment and erosion	Before mitigation	Negative	2	4	4	4	4	2	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	1	2	2	2	2	1	2	20	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • Rehabilitation in accordance with the Rehabilitation Plan for the development must be undertaken in areas disturbed during the decommissioning phase as developed by a specialist. 													

8.1.4 Impacts on Soil and Agriculture

It should be noted that a Soil and Agricultural Compliance Statement (Appendix E4) is not required to formally rate agricultural impacts by way of impact assessment tables and are therefore not provided in this draft EIA Report.

The baseline findings and the Land Capability sensitivity as per the Department of Agricultural, Forestry and Fisheries (DAFF, 2017) national raster file concur with the sensitivity of the area ranging from "Low to Moderate". According to the Land Capability Sensitivity as per the Department of Agricultural, Forestry and Fisheries (DAFF, 2017), the proposed project is characterised with "Low to Moderate" and "Moderate to High" land capability sensitivities. Furthermore, the DFFE (2023) screening agricultural theme (Appendix B) also indicates that the proposed project also falls within areas with high crop field sensitivity areas.

The land capability and land potential of the resources in the regulated area are both characterised by "Moderate" sensitivities. The disputed "Moderate High" sensitivity areas were verified by the specialist on site with soils like the Glenrosa and Rustenburg soil forms being confirmed and the corresponding "Very Low to Low" land capability sensitivity. These soils are also characterised by poor cropping potential.

Therefore overall, the development area can be re-categorised as "Low" sensitivity based on the verified baseline findings, which conforms to the requirements of an agricultural compliance statement only.

Crop field areas with "High" agricultural sensitivities were also identified within the 50 m regulated area. However, no active crop fields were confirmed during the field assessment. Furthermore, the identified highly sensitive crop fields are disputed as they fall on restrictive soil form that also limits cropping practices significantly, which is based on the baseline findings. Therefore, there is no segregation of active productive agricultural lands or crop fields within the Mirach Solar PV Project development area.

It is the specialist's opinion that the Mirach Solar PV Project avoids all sensitive areas, and the proposed activities will have limited impacts on the agricultural production ability of the land.

The development of the Mirach Solar PV Project is therefore confirmed to be appropriate from a soils and agricultural perspective.

8.1.5 Impacts on the Visual Landscape

The visual specialist has undertaken a detailed investigation and impact assessment to identify and consider the visual impacts that could potentially be realised with the development of the Mirach Solar PV Project.

Based on the VIA report's assessment score, the visual impact of the proposed development will be a "*Negative Low Impact*" after mitigation. Receptors likely to be impacted by the proposed development are the nearby property owners and nearby roads. However, a large part of the visual landscape is still reflecting an agricultural landscape with a better visual appearance.

The majority of visual impacts associated with the project are anticipated to occur during the operational phase of the development. Impacts during the construction phase of the Mirach Solar PV Project are typical of the type of visual impacts generally associated with construction activities, such as dust generation and there may be a notable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area. Impacts associated with the design and construction phase of a project are usually of a short duration and temporary in nature but could have long-term effects on the surrounding visual environment if not planned or managed appropriately. It is therefore necessary that the design phase be conducted in such a manner so as not to result in permanent impacts associated with the ill placement of project components or associated infrastructure.

The project is anticipated to operate permanently. The development will operate continuously, 7 days a week. Key elements of the Operation and Management (O&M) Plan include monitoring and reporting the performance of the project, conducting preventative and corrective maintenance, receiving visitors, and maintaining security. Both positive and negative impacts could arise as a result of the operation of the Mirach Solar PV Project.

During operation lighting impacts and solar glint and glare could occur. These lighting impacts relate to the effects of glare and sky glow. The source of glare light is unshielded luminaries which emit light in all directions, and which are visible over long distances. Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the number of light sources. It is possible that the Mirach Solar PV Project may add sky glow to a rural landscape.

Glint and glare occur when the sun reflects off of surfaces with specular (mirror-like) properties. The visual impact of glint and glare relates to the potential it has to negatively affect sensitive visual receptors in relatively close proximity to the source (e.g., residents of neighbouring properties), or aviation safety risks for pilots. Photovoltaic panels are designed to generate electricity by absorbing the rays of the sun and are therefore constructed of dark materials and are covered by an anti-reflective coating. Indications are that as little as 2% of the incoming sunlight is reflected from the surface of modern PV panels.

The decommissioning phase of the project will result in the same visual impacts experienced during the construction phase of the project. However, it is anticipated that the proposed development will be refurbished and upgraded to prolong its life. No decommissioning of the development is proposed.

The visual assessment has indicated that the significance of the construction phase impacts will be low before and after the implementation of the recommended mitigation measures.

During the operation phase, most impacts will be of a low significance, with some of a medium significance prior to the implementation of the recommended mitigation measures. One impact of high significance is expected, but can be mitigated to a low impact significance with the implementation of the recommended mitigation measures. The significance of all impacts during operation following the implementation of the recommended mitigation measures will be reduced to a low significance.

Therefore, no impacts of a high significance are expected to occur with the development of the Mirach Solar PV Project and therefore the development is considered as appropriate from a visual perspective.

Tables 8.22 – 8.35 below provides the visual impact assessment and mitigation measures of the potential impacts associated with the Mirach Solar PV Project.

Table 8.22: Visual Impact during construction of the Solar PV Project.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impact of construction activities on sensitive visual receptors: for the Solar PV Project	Before mitigation	Negative	2	4	2	2	1	1	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	3	2	2	1	1	2	22	Low (6-28)		
<p>Mitigation Measures:</p> <p><u>Planning:</u></p> <ul style="list-style-type: none"> Retain and maintain natural vegetation immediately adjacent to the development footprint. <p><u>Construction:</u></p> <ul style="list-style-type: none"> Ensure that vegetation is not unnecessarily removed during the construction phase. Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible. Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licensed waste site. Reduce and control dust during construction by utilising dust suppression measures. Limit construction activities between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting. Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping. 													

Table 8.23: Visual Impact during construction of the Grid Connection Infrastructure.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impact of construction activities on sensitive visual receptors: for the Grid Connection Infrastructure	Before mitigation	Negative	2	4	2	2	1	1	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	3	2	2	1	1	2	22	Low (6-28)		
<p>Mitigation Measures:</p>													

Planning:

- Retain and maintain natural vegetation immediately adjacent to the development footprint.

Construction:

- Ensure that vegetation is not unnecessarily removed during the construction phase.
- Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) where possible.
- Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.
- Ensure that rubble, litter, etc. are appropriately stored (if it can't be removed daily) and then disposed of regularly at a licensed waste site.
- Reduce and control dust during construction by utilising dust suppression measures.
- Limit construction activities between 07:00 and 18:00, where possible, in order to reduce the impacts of construction lighting.
- Rehabilitate all disturbed areas immediately after the completion of construction work and maintain good housekeeping.

Table 8.24: Visual Impact during operation of the Solar PV Project on receptors within 1 km.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impact on sensitive visual receptors for the Solar PV Project within a 1 km radius	Before mitigation	Negative	2	4	2	3	3	1	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	2	2	3	1	2	26	Low (6-28)		

Mitigation Measures:

Planning:

- Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.
- Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. Additionally, placed in an optimal position to create a screening effect and limit shading on nearby panels.

Operation:

- Maintain the general appearance of the facility as a whole.

Table 8.25: Visual Impact during operation of the Grid Connection Infrastructure on receptors within 1 km.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impact on sensitive visual receptors for the Grid Connection Infrastructure within a 1 km radius	Before mitigation	Negative	2	4	2	2	3	1	2	28	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	4	2	2	3	1	2	28	Low (6-28)		
Mitigation Measures: <u>Planning:</u> <ul style="list-style-type: none"> Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. <u>Operation:</u> <ul style="list-style-type: none"> Maintain the general appearance of the facility as a whole. 													

Table 8.26: Visual Impact during operation of the Solar PV Project on receptors between a 1 km and 3 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impact on sensitive visual receptors for the Solar PV Project between a 1 km and 3 km radius	Before mitigation	Negative	2	3	2	2	3	1	2	26	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	2	2	3	1	2	24	Low (6-28)		
Mitigation Measures: <u>Planning:</u> <ul style="list-style-type: none"> Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. 													

- Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. Additionally, placed in an optimal position to create a screening effect and limit shading on nearby panels.

Operation:

- Maintain the general appearance of the facility as a whole.

Table 8.27: Visual Impact during operation of the Grid Connection Infrastructure on receptors between a 1 km and 3 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Visual impact on sensitive visual receptors for the Grid Connection Infrastructure between a 1 km and 3 km radius	Before mitigation	Negative	2	3	2	2	3	1	2	26	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	3	1	2	3	1	2	24	Low (6-28)		
Mitigation Measures:													
<u>Planning:</u>													
<ul style="list-style-type: none"> • Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. • Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. 													
<u>Operation:</u>													
<ul style="list-style-type: none"> • Maintain the general appearance of the facility as a whole. 													

Table 8.28: Visual Impact during operation of the Solar PV Project on receptors between a 3 km and 5 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Visual impact on sensitive visual receptors for the Solar PV Project between a 3 km and 5 km radius	Before mitigation	Negative	2	2	2	2	3	1	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	1	2	3	1	2	22	Low (6-28)		

Mitigation Measures:

Planning:

- Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.
- Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient.

Operation:

- Maintain the general appearance of the facility as a whole.

Table 8.29: Visual Impact during operation of the Grid Connection Infrastructure on receptors between a 3 km and 5 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Visual impact on sensitive visual receptors for the Grid Connection Infrastructure between a 3 km and 5 km radius	Before mitigation	Negative	2	2	2	2	3	1	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	1	2	3	1	2	22	Low (6-28)		

Mitigation Measures:

Planning:

- Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.
- Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient.

Operation:

- Maintain the general appearance of the facility as a whole.

Table 8.30: Visual Impact during operation of the Solar PV Project on receptors between a 5 km and 10 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Visual impact on sensitive visual receptors for the	Before mitigation	Negative	2	2	2	2	3	1	2	24	Low (6-28)	Yes	Yes

Solar PV Project between a 5 km and 10 km radius	After mitigation	Negative	2	2	1	1	3	1	1	10	Low (6-28)		
<p>Mitigation Measures:</p> <p><u>Planning:</u></p> <ul style="list-style-type: none"> Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. <p><u>Operation:</u></p> <ul style="list-style-type: none"> Maintain the general appearance of the facility as a whole. 													

Table 8.31: Visual Impact during operation of the Grid Connection Infrastructure on receptors between a 5 km and 10 km radius.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Visual impact on sensitive visual receptors for the Solar PV Project between a 5 km and 10 km radius	Before mitigation	Negative	2	2	2	2	3	1	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	1	1	3	1	1	11	Low (6-28)		
<p>Mitigation Measures:</p> <p><u>Planning:</u></p> <ul style="list-style-type: none"> Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. <p><u>Operation:</u></p> <ul style="list-style-type: none"> Maintain the general appearance of the facility as a whole. 													

Table 8.32: Lighting impacts during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impacts of lighting at night on sensitive visual receptors in close proximity to the Solar PV Project.	Before mitigation	Negative	2	4	1	2	3	1	4	56	High (51-73)	Yes	Yes
	After mitigation	Negative	2	3	1	2	3	1	2	24	Low (6-28)		
<p>Mitigation Measures:</p> <p><u>Planning and Operation:</u></p> <p>As far as practically possible:</p> <ul style="list-style-type: none"> • Shield the source of light by physical barriers (walls, vegetation etc.), if possible. • Limit mounting heights of lighting fixtures, or alternatively use footlights or bollard level lights. • Make use of minimum lumen or wattage in fixtures. • Make use of down-lighters, or shield fixtures. • Make use of low-pressure sodium lighting or other types of low impact lighting such as warm LED lights that are not too bright. • Make use of motion detectors on security lighting, if possible. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. • Explore the use of night vision or thermal security cameras which are very effective and can replace security lighting entirely. 													

Table 8.33: Solar glint and glare impacts during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impacts of glint and glare as a visual distraction and possible air travel hazard	Before mitigation	Negative	2	1	1	1	3	1	2	18	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	1	1	1	3	1	2	18	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • No mitigation measures are required. 													

Table 8.34: Sense of place impacts during operation for the Solar PV Project.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impacts on sense of place associated with the operational phase of the Solar PV Project	Before mitigation	Negative	2	4	3	3	3	1	3	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	2	3	3	1	2	28	Low (6-28)		
Mitigation Measures:													
<ul style="list-style-type: none"> Implement good housekeeping measures. 													

Table 8.35: Sense of place impacts during operation for the Grid Connection Infrastructure.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impacts on sense of place associated with the operational phase of the Grid Connection Infrastructure	Before mitigation	Negative	2	3	2	2	3	1	2	26	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	3	1	2	3	1	2	24	Low (6-28)		
Mitigation Measures:													
<ul style="list-style-type: none"> Implement good housekeeping measures. 													

8.1.6 Impacts on the Social Environment

The social specialist has undertaken a detailed investigation and impact assessment to identify and consider the social impacts that could potentially be realised with the development of the Mirach Solar PV Project.

This Social Impact Assessment focused on the collection of data to identify and assess social issues and potential social impacts associated with the development of the Mirach Solar PV Project. Secondary data was collected and presented in a literature review and primary data was collected through consultations with affected and adjacent landowners and key stakeholders. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts.

There are some vulnerable communities within the area that may be affected by the development of the Mirach Solar PV Project and its associated infrastructure. Traditionally, the construction phase of a PV energy facility is associated with most social impacts. Many of the social impacts are unavoidable and will take place to some extent but can be managed through the careful planning and implementation of appropriate mitigation measures. Several potential positive and negative social impacts have been identified for the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are of such a high and unacceptable significance to allow them to be classified as “fatal flaws”.

Potential negative social impacts can be associated with the construction phase of the Mirach Solar PV Project, additionally social impacts are not only associated with the construction phase of PV projects but typical of construction on all projects. It is related to the influx of non-local workforce and jobseekers, intrusion and disturbance impacts (i.e., noise and dust, wear and tear on roads, and safety and security risks) and could be reduced with the implementation of mitigation measures proposed. The significance of such impacts on surrounding communities can therefore be mitigated.

During operation, both positive and negative impacts are expected to occur. The positive impacts include employment and skills development opportunities, development of renewable energy infrastructure, contribution to local economic development and upliftment and impacts on tourism. The negative impacts include impacts on tourism, loss of agricultural land and visual and sense of place impacts.

Typically, major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income and will be similar to the impacts during the construction phase. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the Mirach Solar PV Project it is anticipated that the proposed facility will be refurbished and upgraded to prolong its life. No decommissioning of the facility is proposed.

When considering the impact significance of the proposed development the assessment has indicated that negative construction phase impacts will be of a medium significance prior to the implementation of the recommended mitigation measures and for most impacts the significance can be reduced to a low significance with mitigation. No impacts of a high negative significance are expected during construction.

Operation phase social impacts will mainly also be of a medium significance prior to the implementation of the recommended mitigation measures and for all impacts the significance can be reduced to an acceptable level of significance with mitigation. No impacts of a high negative significance are expected during construction.

From a social perspective the impacts assessed and the significance thereof, with the implementation of the recommended mitigation measures indicate that the development is acceptable from a social perspective.

Tables 8.36 – 8.50 below provides the social impact assessment and mitigation measures of the potential impacts associated with the Mirach Solar PV Project.

Table 8.36: Employment opportunities during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before enhancement	After enhancement											
The creation of direct and indirect employment opportunities during the construction phase of the project	Before enhancement	Positive	2	4	1	1	1	2	2	22	Low (6-28)	Yes	Yes
	After enhancement	Positive	2	4	1	1	1	3	3	36	Medium (29-50)		
Enhancement Measures: <ul style="list-style-type: none"> • A local employment policy should be adopted to maximise opportunities made available to the local labour force. • Labour should be sourced from the local labour pool, and only if the necessary skills aren't available should labour be sourced from (in order of preference) the greater Waterberg DM, Limpopo Province, South Africa, or elsewhere. • Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase. • As with the labour force, suppliers should also as far as possible be sourced locally. • Where feasible, local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. 													

Table 8.37: Economic multiplier effect during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before enhancement	After enhancement											
Significance of the impact from the economic multiplier effects from the use of local goods and services	Before enhancement	Positive	2	2	1	1	1	2	2	18	Low (6-28)	Yes	Yes
	After enhancement	Positive	3	3	1	1	1	2	3	33	Medium (29-50)		
Enhancement Measures: <ul style="list-style-type: none"> • It is recommended that a local procurement policy is adopted to maximise the benefit to the local economy. • A database of local companies, specifically Historically Disadvantaged Individuals (HDIs) which qualify as potential service providers (e.g., construction companies, security companies, catering companies, waste collection companies, transportation companies etc.) should be created and companies listed thereon should be invited to bid for project related work where applicable. 													

- Local procurement is encouraged along with engagement with local authorities and business organisations to investigate the possibility of procurement of construction materials, goods and products from local suppliers where feasible.

Table 8.38: Loss of productive farmland during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
The potential loss in productive farmland during the construction phase, due to factors such as the construction of roads, the preparation of foundations, power lines, offices etc.	Before mitigation	Negative	1	3	2	2	1	2	3	33	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	2	2	1	2	2	20	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> The proposed site for the Mirach Solar PV Project needs to be fenced off prior to the construction phase and all construction related activities should be confined in this fenced off area. Livestock grazing on the proposed development footprint area needs to be relocated. All affected areas outside the development footprint, which are disturbed during the construction phase, need to be rehabilitated prior to the operational phase and should be continuously monitored by the Environmental Control Officer (ECO). Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints. Mitigation measures from the Agricultural and Soil Report should also be implemented. 													

Table 8.39: Influx of jobseekers during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
In-migration of labourers in search of employment opportunities, and a	Before mitigation	Negative	2	2	4	3	1	3	2	36	Medium (29-50)	Yes	Yes

resultant change in population, and increase in pressure on local resources and social networks, or existing services and infrastructure	After mitigation	Negative	2	2	4	3	1	2	1	16	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Develop and implement a local procurement policy which prioritises “locals first” to prevent the movement of people into the area in search of work. • Engage with local community representatives prior to construction to facilitate the adoption of the locals first procurement policy. • Provide transportation for workers to ensure workers can easily access their place of employment and do not need to move closer to the project site. • Working hours should be kept between daylight hours during the construction phase, as far as possible, and / or as any deviation that is approved by the relevant authorities. • Compile and implement a grievance mechanism. • Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour. • Prevent the recruitment of workers at the project site. • Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints. • Establish clear rules and regulations for access to the proposed site. • Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours. • Inform local community organisations and policing forums of construction times and the duration of the construction phase. • Establish procedures for the control and removal of loiterers from the construction site. 													

Table 8.40: Safety and security impacts during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Temporary increase in safety and security concerns associated with the influx of people during the construction phase	Before mitigation	Negative	2	3	1	1	1	3	3	33	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	1	1	1	2	2	18	Low (6-28)		
<p>Mitigation Measures:</p> <ul style="list-style-type: none"> • Working hours should be kept within daylight hours during the construction phase, as far as possible, and / or as any deviation that is approved by the relevant authorities. • Provide transportation for workers to prevent loitering within or near the project site outside of working hours. • The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site. The fencing of the site should be maintained throughout the construction period. 													

- A security company must be appointed to ensure appropriate security procedures and measures are implemented.
- Access in and out of the construction site should be strictly controlled by a security company appointed to the project.
- A CLO should be appointed as a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.
- A stakeholder management plan must be compiled to address neighbouring farmer concerns regarding safety and security.
- The project proposed must prepare and implement a Fire Management Plan; this must be done in conjunction with surrounding landowners.
- The EPC Contractor must prepare a Method Statement which deals with fire prevention and management.

Table 8.41: Impacts on daily living and movement patterns during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Temporary increase in traffic disruptions and movement patterns during the construction phase	Before mitigation	Negative	2	2	2	1	1	1	3	27	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	1	1	1	1	2	16	Low (6-28)		

Mitigation Measures:

- All vehicles must be road worthy, and drivers must be qualified, obey traffic rules, follow speed limits and be made aware of the potential road safety issues.
- Heavy vehicles should be inspected regularly to ensure their road worthiness.
- Provision of adequate and strategically placed traffic warning signs, that have to be maintained for the duration of the construction phase, and control measures along the gravel road to warn road users of the construction activities taking place for the duration of the construction phase. Warning signs must be always visible, especially at night.
- Implement penalties for reckless driving to enforce compliance to traffic rules.
- As far as possible, avoid heavy vehicle activity during "peak" hours (when children are taken to school, or people are driving to work).
- The developer and EPC Contractor must ensure that all fencing along access roads is maintained in the present condition or repaired if disturbed due to construction activities.
- Ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if disturbed due to construction activities.
- Ensure that damage / wear and tear caused by construction related traffic to the access roads is repaired before the completion of the construction phase.
- A method of communication must be implemented whereby procedures to lodge complaints are set out for the local community to express any complaints or grievances with the construction process.

Table 8.42: Nuisance impacts during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Nuisance impacts in terms of temporary increase in noise and dust, and wear and tear on access roads to the site	Before mitigation	Negative	2	3	1	1	1	3	4	44	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	1	1	1	2	3	30	Medium (29-50)		
Mitigation Measures: <ul style="list-style-type: none"> • The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues. • A CLO should be appointed, and a grievance mechanism implemented. 													

Table 8.43: Increased risk of potential veld fires during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
The potential loss of livestock, crops, and farmsteads in the area. This also includes the damage and loss of farm infrastructure and the threatening of human lives that are associated with the increased risk of veld fires	Before mitigation	Negative	2	3	2	3	1	1	4	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	3	1	2	1	1	2	18	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • A firebreak should be implemented before the construction phase. The firebreak should be controlled and implemented around the perimeters of the project site. • Adequate fire-fighting equipment should be provided and readily available on site and all staff should be trained in firefighting and how to use the fire-fighting equipment. 													

- No staff (except security) should be accommodated overnight on site and the contractor should ensure that no open fires are allowed on site. The use of cooking or heating implements should only be used in designated areas.
- Contractors need to ensure that any construction related activities that might pose potential fire risks, are done in the designated areas where it is also managed properly.
- Precautionary measures need to be taken during high wind conditions or during the winter months when the fields are dry.
- The project will adhere to the National Forest and Veld Fires act and the fire management plan. It is recommended that the project proponent join the local fire association.

Table 8.44: Visual and sense of place impacts during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Intrusion impacts from construction activities will have an impact on the area’s “sense of place”	Before mitigation	Negative	2	3	3	1	1	2	3	36	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	2	1	1	1	2	20	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project. • To the extent possible, limit noise generating activities to normal daylight working hours and avoid weekends and public holidays. • The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible. • Dust suppression measures must be implemented for heavy vehicles such as wetting of gravel roads on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. • All vehicles must be road-worthy, and drivers must be qualified and made aware of the potential road safety issues and need for strict speed limits. • Communication, complaints, and grievance channels must be implemented and contact details of the CLO must be provided to the local community in the study area. 													

Table 8.45: Employment and skills development during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before enhancement	After enhancement											
The creation of employment opportunities and skills	Before enhancement	Positive	3	3	3	1	3	2	1	15	Low (6-28)	Yes	Yes

development opportunities during the operation phase for the country and local economy	After enhancement	Positive	3	4	4	1	3	3	2	36	Medium (29-50)		
Enhancement Measures: <ul style="list-style-type: none"> • It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community. • The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. • Vocational training programs could be established to promote the development of skills, or other investments in local skills development, education and/or local enterprise development initiatives. 													

Table 8.46: Development of non-polluting, renewable energy infrastructure during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before enhancement	After enhancement											
Development of non-polluting, renewable energy infrastructure	Before enhancement	Positive	4	4	1	2	4	3	2	36	Medium (29-50)	Yes	Yes
	After enhancement	Positive	4	4	1	2	4	3	2	36	Medium (29-50)		
Enhancement Measures: <ul style="list-style-type: none"> • None identified. 													

Table 8.47: Potential loss of agricultural land during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Loss of agricultural land and overall productivity as a result of the operation of the proposed project	Before mitigation	Negative	1	3	2	3	3	3	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	1	2	3	2	2	22	Low (6-28)		

on an agricultural property												
Mitigation Measures: <ul style="list-style-type: none"> Mitigation measures from the Agricultural and Soil Report must be implemented. 												

Table 8.48: Economic development and social upliftment during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Contribution to Local Economic Development (LED) and social upliftment during the operation of the project	Before enhance ment	Positive	4	4	2	1	3	2	3	48	Medium (29-50)	Yes	Yes
	After enhance ment	Positive	4	4	3	1	3	3	4	72	High (51-73)		
Enhancement Measures: <ul style="list-style-type: none"> A CNA must be conducted to ensure that the LED and social upliftment programmes proposed by the project are meaningful. – Ongoing communication and reporting are required to ensure that maximum benefit is obtained from the programmes identified, and to prevent the possibility for such programmes to be misused. The programmes should be reviewed on an ongoing basis to ensure that they are best suited to the needs of the community at the time (bearing in mind that these are likely to change over time). 													

Table 8.49: Impact on tourism during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
The potential impact on tourism due to the establishment of the Mirach Solar PV Project	Before mitigation	Negative / Positive	2	3	1	1	3	2	2	24	Low (6-28)	Yes	Yes
	After mitigation	Negative / Positive	2	3	1	1	3	2	2	24	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> The subjectivity towards the project in its entirety can be influenced. Implement good housekeeping measures. 													

Table 8.50: Visual and sense of place impact during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Before mitigation	After mitigation											
Visual impacts and sense of place impacts associated with the operation phase of the Mirach Solar PV Project	Before mitigation	Negative	2	3	1	3	3	3	3	45	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	1	2	3	2	3	36	Medium (29-50)		
Mitigation Measures: <ul style="list-style-type: none"> To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed Mirach Solar PV Project, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard. 													

8.1.7 Impacts on Heritage Resources

For the Mirach Solar PV Project development area, the impacts to heritage sites are expected to be of low significance. However, this can be ameliorated by implementing mitigation measures, including isolating sites, relocating sites (e.g. burials) and excavating or sampling any significant archaeological material if discovered within the area. The chances of further such material being discovered, however, are considered to be negligible. After mitigation, the overall impact significance would therefore be low.

As no sites, features or objects of cultural significance were identified, no mitigation measures were proposed. The specialist has however provided management measures for inclusion as part of the EMPr.

Considering the low impact significance associated with the development of the Mirach Solar PV Project, as well as the absence of heritage resources within the development area, it is confirmed that the proposed development is considered as acceptable from a heritage perspective.

The potential impacts related to heritage are assessed below in Table 8.51.

Table 8.51: Impacts on heritage resources during construction, operation and decommissioning.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
As no sites, features or objects of cultural historic significance have been identified, there would be no impact as a result of the proposed development	Before mitigation	Negative	1	1	1	1	1	1	1	6	Low (6-28)	Yes	Yes
	After mitigation	Negative	1	1	1	1	1	1	1	6	Low (6-28)		
<p>Management Measures:</p> <ul style="list-style-type: none"> • Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. • If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits. • Known sites (where discovered) must be clearly marked, so that they can be avoided during construction activities. • The contractors and workers must be notified that archaeological sites might be exposed during the construction activities. • Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, must cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible. • All discoveries must be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO must advise the necessary actions to be taken. • Under no circumstances must any artefacts be removed, destroyed or interfered with by anyone on the site. • Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51(1). • A person or entity, e.g. the ECO, must be tasked to take responsibility for the maintenance of heritage sites (where present). • In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it must be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official must be part of the team executing these measures. 													

8.1.8 Impacts on Palaeontology

When considering the geology of the Mirach Solar PV Project, the palaeontologist has indicated that the development of the Mirach Solar PV Project will have an overall low palaeontological significance.

It is therefore considered that the development will not lead to detrimental impacts on the palaeontological resources of the area. The Mirach Solar PV Project may therefore be authorised, as the whole extent of the development footprint is not considered sensitive in terms of Palaeontological Heritage.

If Palaeontological Heritage is uncovered during surface clearing and excavations, the Chance find Protocol included in the Palaeontological Impact Assessment (Appendix E8) should be implemented immediately. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources Agency (SAHRA) (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that mitigation (recording and collection) can be carried out.

Before any fossil material can be collected from the development site, the specialist involved would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork should meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

Based on the above, no formal impact assessment table has been provided by the specialist, only a summary of the impact assessment. Refer to Table 8.52 below.

Table 8.52: Summary of the impacts on palaeontological resources during construction.

Impact	Pre-mitigation	Post mitigation	Mitigation Measures
Disturbance, damage or destruction of legally protected fossil heritage within the development	34	14	If fossil remains are discovered during any phase of construction, either on the surface or exposed by fresh excavations ECO in charge of these developments must be notified immediately. These

footprint during the construction phase			discoveries ought to be protected (if possible, <i>in situ</i>) and the ECO must report to SAHRA (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) so that suitable mitigation (e.g., recording and collection) can be carry out by a palaeontologist
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8.2 Concluding Statement on the Impact Assessment

When considering the impact assessment undertaken for the Mirach Solar PV Project development it is confirmed, through the consideration of the results that no unacceptable impacts are expected to occur with the implementation of the recommended mitigation measures provided for by the independent specialists.

Majority of the negative impacts have been identified as being of a medium significance before the implementation of recommended mitigation measures and can in most instances be reduced to a low impact significance. Impacts of high significance have also been identified with all impacts being reduced to an acceptable impact significance following mitigation.

One impact will however continue to be of a high significance following the implementation of mitigation measures which is the collision of avifauna with infrastructure associated with the Mirach Solar PV Project. However, the specialist indicates that the impact would still be considered acceptable and is not a fatal flaw.

8.3 Legal Requirements Complied with in Section 8 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(h)(v) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (v) the impacts and risks identified, 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.	The potential impacts and risks identified to be associated with the development of the Mirach Solar PV Project is considered in section 8.1. This includes the details of the impact nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed or mitigated.
3(1)(h)(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.	The potential positive and negative impacts and risks identified to be associated with the development of the Mirach Solar PV Project is considered in section 8.1. These impacts have been identified from the inputs provided by the various independent specialist reports included in Appendix E.
3(1)(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	Mitigation measures and recommendations for the management of the potential impacts and environmental sensitivities have been included in section 8.1.
3(1)(i)(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated	The potential impacts, risks and issues identified to be associated with the

<p>structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process.</p>	<p>development of the Mirach Solar PV Project is considered in section 8.1.</p>
<p>3(1)(i)(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.</p>	<p>Each impact has been assessed in section 8.1 which provides an indication of the impact significance with mitigation and without mitigation.</p>
<p>3(1)(j) an assessment of each identified potentially significant impact and risk, including (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated.</p>	<p>The potential impacts and risks identified to be associated with the development of the Mirach Solar PV Project is considered in section 8.1. This includes the details of the impact nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts can be reversed; may cause irreplaceable loss of resources; and can be avoided, managed or mitigated.</p>
<p>3(1)(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 of these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report.</p>	<p>A summary of the findings and recommendations from each specialist report is included in section 8.1.</p>

<p>3(1)(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.</p>	<p>The recommendations from the specialist reports for the Mirach solar PV Project is included in section 8.1.</p>
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9 CUMULATIVE IMPACT ASSESSMENT

The EIA Regulations, 2014 (as amended) determine that cumulative impacts, “in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.”

A geographic area must be determined within which the effects of the potential cumulative impacts will be relevant and experienced, and therefore the spatial boundary within which the cumulative impact assessment will be undertaken. The spatial boundary evaluated in this cumulative assessment generally includes an area of a 30 km radius surrounding the proposed development.

Within the geographic area under consideration (i.e., 30 km radius) no other known approved solar energy projects / developments are present. It is unclear whether other projects not related to renewable energy are or have been or will be constructed in this area. In general, development activity in the area is focused on agriculture, natural grazing and urban development (town of Thabazimbi).

9.1 Process followed for the identification and assessment of cumulative impacts

Available information regarding the geographical area under consideration in terms of the cumulative impact assessment was gathered through the use of existing databases, on-ground information collected by the EAP and the Applicant and general information to the area as provided by the independent specialists.

Figure 9.1 below provides an indication of the flow of information to the specialists and how the information has been attributed to the cumulative impact assessment discussed in this section.

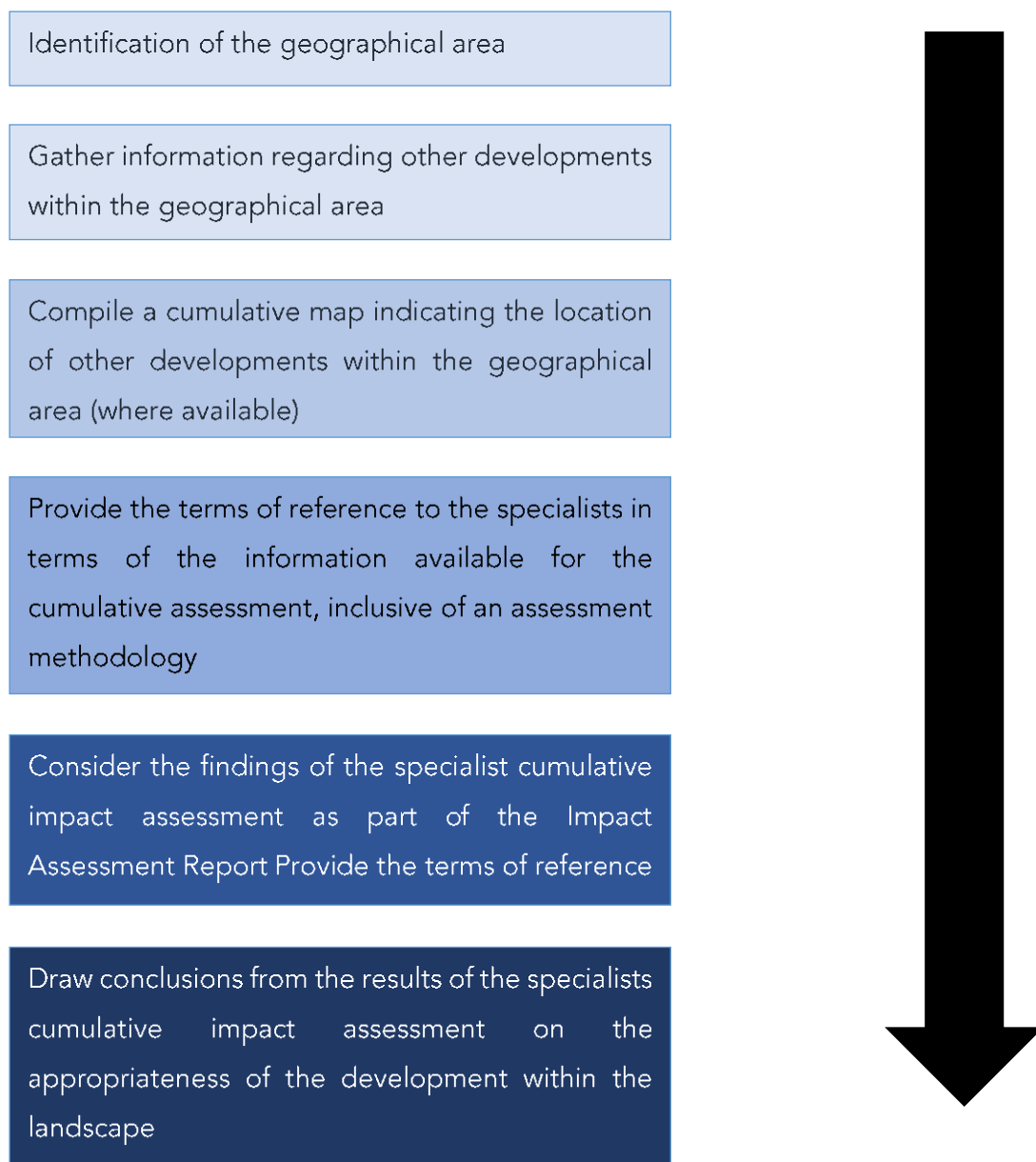


Figure 9.1: Process flow indicating the process followed for the assessment of cumulative impacts.

9.2 Other Developments within the area

The area surrounding the Mirach Solar PV Project is characterised mostly by a low number of farmsteads/ buildings that are sparsely populated. The area is located in the agricultural region of the area with livestock and game farming the most prominent activities. The area surrounding the development is low in development and features cattle and game farming. The proposed development is also situated in a serene Bushveld setting that is renowned for

its tranquillity. The area is a popular destination for tourists who are drawn to hunting and the complete safari experience. Additionally, the region also attracts international hunters seeking an authentic African hunting experience. Although the project is in close proximity to private nature reserves, these reserves are mainly used for hunting and livestock farming.

The Mirach Solar PV Project is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties currently used for grazing. The affected farm portion has not been considered for an alternative future land use such as urban development, agriculture or mining.

The Thabazimbi area and its surrounds (within which the Mirach Solar PV Project is proposed) receives a suitable annual amount of solar radiation which is considered appropriate for the development of solar energy facilities. It can therefore be expected that the area will be developed for solar energy facilities.

A process to identify related projects that may have a cumulative impact, in a 30 km radius of the development area was undertaken. The National Department of Forestry, Fisheries and the Environment (DFFE) website was consulted as well as knowledge from the Applicant on other developments present within the surrounding area of the Mirach Solar PV Project.

No other developments are located within a 30 km radius from the Mirach Solar PV Project. Refer to Figure 9.2 below.

Considering the absence of other developments within a 30 km radius the development of Mirach Solar PV Project within the area is not likely to have a cumulative impact on the environment (a low / negligible impact) as it would be the first of its kind proposed within the geographical area under assessment for cumulative impacts.

Should other developments be proposed within a 30 km radius from the Mirach Solar PV Project these said developments will have to consider the cumulative impacts in terms of the Mirach Solar PV Project as it would be the first of its kind proposed.

In terms of the desirability of the development of renewable energy, it may be preferable to incur a higher cumulative loss in such a region as this one (where the landscape has already experienced degradation), than to lose land with a higher environmental value elsewhere in the country.

As the grid connection corridor runs parallel to the existing Thabazimbi Combined / Waterberg 1 132 kV overhead power line the impacts of the linear disturbance will be concentrated within the landscape and therefore negligible impact is expected in this regard.

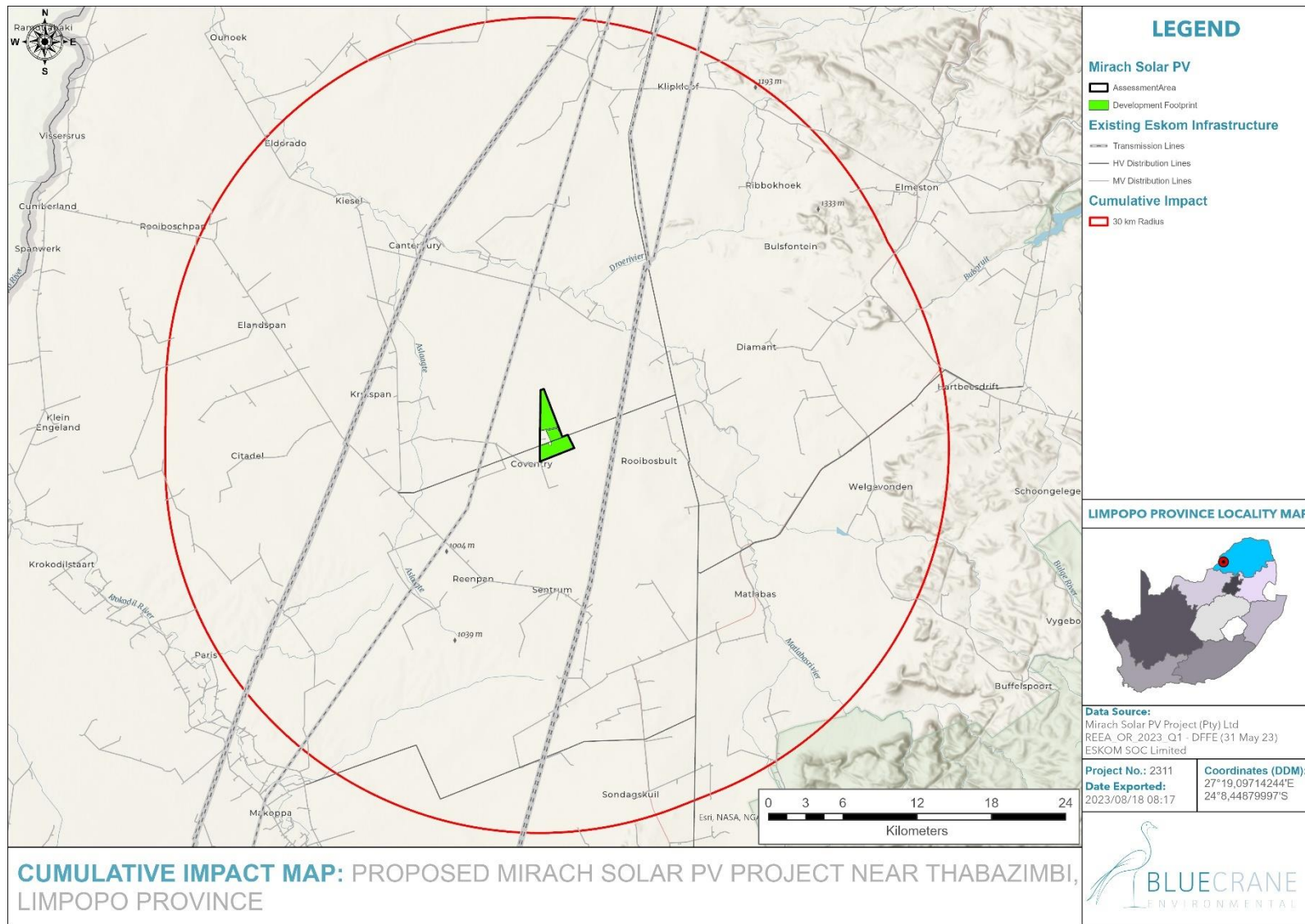


Figure 9.2: Cumulative map of the Mirach Solar PV Project.

9.3 Specialist input

The following input and assessment have been provided by the independent specialists for the development of the Mirach Solar PV Project.

Due to the absence of other solar developments proposed within a 30 km radius from the Mirach Solar PV Project it is not possible for the independent specialists to undertake a detailed cumulative impact assessment due to the lack of potential cumulative impacts.

No cumulative impacts have been identified by the terrestrial ecology, wetland, soils and agriculture and palaeontological specialists. Cumulative impact assessments have however been undertaken by the avifauna, visual, social and heritage specialists. The results indicate that a low or negligible cumulative impact is expected. Refer to the sections below.

9.3.1 Avifauna

Cumulative impacts are assessed within the context of the extent of the proposed project area, other similar developments and activities in the area (existing and in-process), and general habitat loss and transformation resulting from any other activities in the area. Localised cumulative impacts include those from operations that are close enough (within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors (relevant operations include nearby large road networks, other solar PV facilities, and power infrastructure). Relevant impacts include the overall reduction of foraging and nesting/burrowing habitat, dust deposition, noise and vibration, disruption of functional corridors of habitat important for movement and migration, disruption of waterways, groundwater drawdown, and groundwater and surface water quality depletion.

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent reserves.

According to the 2021 National Biodiversity Assessment, the total amount of habitat within 30 km of the project amounts to 377433 ha, but when considering the transformation that has taken place within this radius – only 358981 ha remains. Therefore, the area within 30 km of the Mirach Solar PV Project has experienced approximately 4.9% loss in natural habitat. Considering this context, the project footprint is 1039 ha (assuming the total extent of the project area is developed and the power line). No other similar projects exist within a 30 km

radius. This means that the total amount of remaining habitat lost as a result of solar projects in the region amounts to 0,002% (the sum of all related developments as a percentage of the total remaining habitat).

As such the cumulative impact from the proposed development is rated as "Low". It is imperative that careful spatial management and planning of the entire region be a priority, and existing large infrastructure projects must be carefully monitored over the long term.

Refer to Table 9.1 below for the cumulative impact assessment.

Table 9.1: Avifauna cumulative impact assessment.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Loss of habitat, and disruption of surrounding ecological corridors. As well as the influences of pollution (water, noise, air, etc.).	Impact in isolation	Negative	2	3	2	2	2	2	2	26	Low (6-28)	Yes	Yes
	Cumulative impact	Negative	2	3	2	2	2	2	2	26	Low (6-28)		
Mitigation Measures: <ul style="list-style-type: none"> • Demarcate areas to be developed. • Avoid all sensitive environmental features. 													

9.3.2 Visual

The visual specialist confirms that no other solar PV plant applications have been submitted to the DFFE within the geographic area of investigation. The potential for cumulative impacts to occur as a result of the Mirach Solar PV Project are therefore unlikely.

The anticipated cumulative visual impact for the Mirach Solar PV Project is expected to include the change in sense of place, as well as the precedent being set for Solar PV projects in the area where currently there is only a precedent for agricultural developments. The construction and operation of the Mirach Solar PV Project in the area is likely to have a negative impact.

Refer to Table 9.2 below for the cumulative impact assessment.

Table 9.2: Visual cumulative impact assessment.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
Cumulative visual impacts	Impact in isolation	Negative	2	2	2	2	3	1	2	24	Low (6-28)	N/A	N/A
	Cumulative impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Mitigation Measures: <ul style="list-style-type: none"> Retain / re-establish and maintain natural vegetation immediately adjacent to the development footprint / servitude. 													

9.3.3 Social

The social specialist confirms that no other solar PV plant applications have been submitted to the DFFE within the geographic area of investigation. The potential for cumulative impacts to occur as a result of the Mirach Solar PV Project are therefore unlikely.

The specialist has however identified two potential social cumulative impacts as described below.

The Mirach Solar PV Project and the establishment of other solar power projects within the area (should any be proposed) has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services would be more considerable than that of the Mirach Solar PV Project alone, where these become relevant.

While the development of a single solar power project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment, and the low level of earning potential may attract individuals to the area in search of better employment opportunities and higher standards of living.

It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important to implement and maintain strict adherence with a local employment policy to reduce the potential of such an impact occurring, where relevant.

Refer to Tables 9.3 and 9.4 below for the cumulative impact assessment.

Table 9.3: Social cumulative impact from employment, skills and business opportunities.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Impact in isolation												
An increase in employment opportunities, skills development and business opportunities with the establishment of more than one solar power facility.	Impact in isolation	Positive	2	1	1	1	3	2	2	20	Low (6-28)	N/A	N/A
	Cumulative impact	N/A	N/A	N/A	N/A	N/A	N/A	N/a	N/a	N/A	N/a		
Enhancement Measures: <ul style="list-style-type: none"> The establishment of several solar power projects under the REIPPP Programme in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the developers to maximise the project opportunities available to the local community. 													

Table 9.4: Social cumulative impact from large-scale in-migration of people.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated?	Is the impact acceptable?
	Impact in isolation												
Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area.	Impact in isolation	Negative	2	1	1	1	2	1	2	16	Low (6-28)	N/A	N/A
	Cumulative impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
Mitigation Measures: <ul style="list-style-type: none"> Develop a recruitment policy / process (to be implemented by contractors), which will source labour locally. Work together with government agencies to ensure service provision is in line with the development needs of the local area. 													

9.3.4 Heritage

Heritage resources are sparsely distributed on the wider landscape with highly significant (Grade 1) sites being rare. Because of the low likelihood of finding further significant heritage resources in the area of the proposed development and the generally low density of sites in the wider landscape the overall impacts to heritage are expected to be of generally low significance before mitigation.

For the development area, the impacts to heritage sites are expected to be of low significance. This can further be lowered by implementing mitigation measures, including isolating sites, relocating sites (e.g. burials) and excavating or sampling any significant archaeological material found to occur within the project area. The chances of further such material being found, however, are considered to be negligible. After mitigation, the overall impact significance would therefore be low.

The cumulative impact on heritage is therefore confirmed by the specialist as negligible.

9.4 Concluding Statement

When considering the location of the Mirach Solar PV Project and the 30 km geographical area the area is characterised by agricultural activities and linear disturbances such as national and regional roads and transmission and distribution overhead power lines.

In the absence of other renewable energy facilities present within a 30 km radius from the Mirach Solar PV Project, negligible cumulative impacts are relevant.

With the development of the Mirach Solar PV Project a precedent is being set for Solar PV projects in the area where currently there is only a precedent for agricultural developments. As no other facilities are proposed, the landscape still has an acceptable level of resilience in terms of the development of solar energy facilities and therefore the development of the Mirach Solar PV Project is considered to be acceptable within the landscape from a cumulative impact assessment perspective.

As the grid connection corridor runs parallel to the existing Thabazimbi Combined / Waterberg 1 132 kV overhead power line the impacts of the linear disturbance will be concentrated within the landscape and therefore negligible impact is expected in this regard.

9.5 Legal Requirements Complied with in Section 9 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts.	Section 9 of this report provides an assessment of the cumulative impacts associated with the Mirach Solar PV Project.

10 DEVELOPMENT FOOTPRINT AND ALTERNATIVES ANALYSIS

This section provides an analysis of the draft development footprint proposed by the Applicant for the Mirach Solar PV Project. Furthermore, the preferred alternatives from an environmental perspective are discussed and motivated as part of this section.

10.1 Site Sensitivity and Alternatives Analysis for the Facility Layout Design

The independent specialist studies undertaken have confirmed specific ground-truthed environmental sensitivities within the development area and draft development footprint / facility layout that needs to be avoided by the placement of infrastructure and within which no disturbance is allowed to take place.

The large extent of the development area (i.e., 747 ha) assessed results in an opportunity for the avoidance of the sensitive environmental features and areas through the careful placement of the development footprint and infrastructure layout. The Applicant has considered all environmental sensitivities as part of this EIA Phase and has designed an appropriate facility layout that is considered to be acceptable. This facility layout has also been considered and assessed by the independent specialists as part of the EIA Phase.

The mitigation hierarchy explored as part of the site selection process (section 2.3) was further applied as part of the design of the development footprint. The Applicant has considered all recommended buffers, and thereby designed a facility layout which avoids these no-go areas to ensure no disturbance is undertaken, including the placement of infrastructure. The facility layout proposed is therefore considered to be optimised and preferred as small changes and tweaks to the design has resulted in an optimised layout which is considered to be appropriate from an environmental perspective.

Water resources present within the development footprint have been identified that need to be avoided, including the associated buffers. These include two depressions. The depression wetlands, and the associated buffers, need to be avoided by the development footprint. The wetland specialist has recommended 15 m buffers for the wetlands. Refer to Figure 10.1. These features and buffers have been avoided (Figure 10.2), the power line route will just need to be carefully placed outside of the features within the assessed corridor.

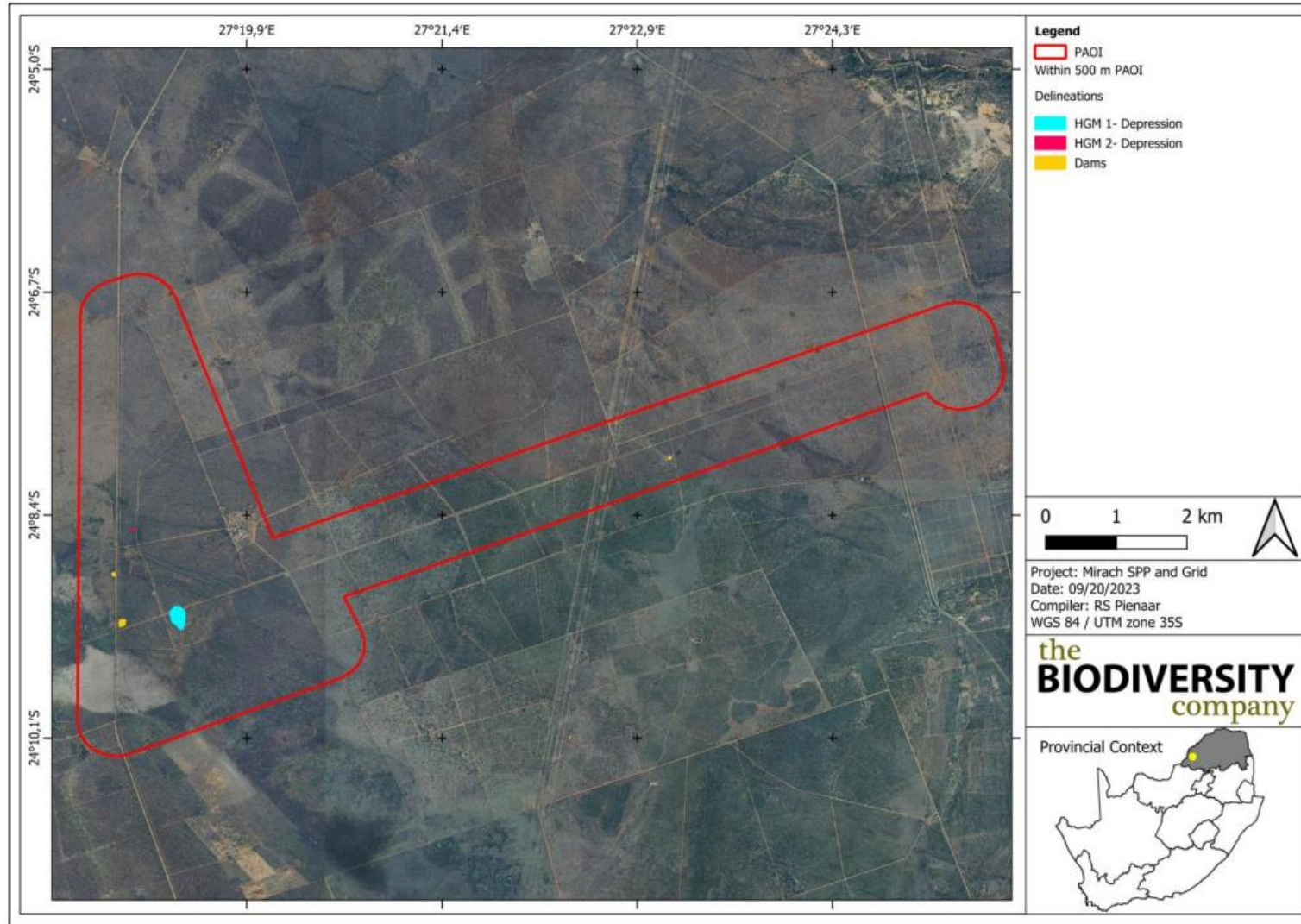


Figure 10.1: Wetland features present within the Mirach Solar PV Project development footprint.

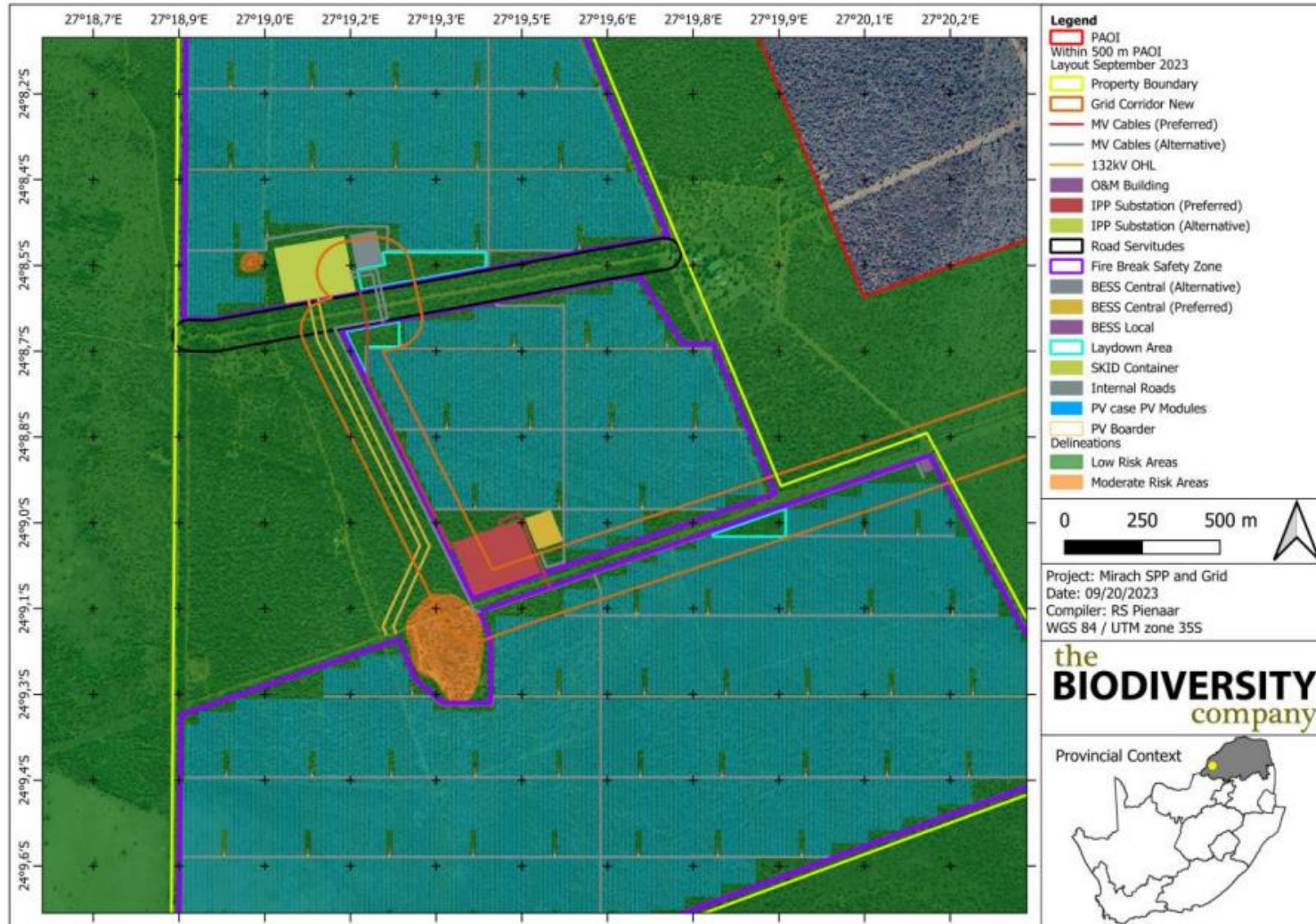


Figure 10.2: Wetland specialist confirmation of avoidance within the Mirach Solar PV Project development footprint.

Further to the above, the grid connection corridor traverses a patch that has been identified as Rocky Bushveld by the Terrestrial Ecologist (Appendix E1). This area is of a high sensitivity. This unit is considered to be intact and development activities of medium impact acceptable followed by appropriate restoration activities. As this habitat is traversed by the grid connection corridor minor impact will be undertaken as it will entail the placement of limited power line pylons of a limited extent and a service road within a much smaller servitude of 36 m wide. Refer to Figure 10.3. The placement of the infrastructure is therefore considered to be appropriate in this area.

Figure 10.4 provides the environmental sensitivity map overlain with the optimised and preferred development footprint proposed for the Mirach Solar PV Project.

The following is concluded regarding the alternatives assessed for the Mirach Solar PV Project:

- Considering the optimisation undertaken by the Applicant to the development footprint to ensure avoidance of sensitive environmental features it is confirmed that the optimised development footprint / facility layout is preferred from an environmental perspective. Refer to Appendix F.
- In terms of the substation location alternatives proposed all specialists have indicated that both locations are acceptable and that the technically preferred alternative (Alternative 1) must therefore be put forward for Environmental Authorisation.
- In terms of the BESS location alternatives, it is confirmed that all options are acceptable from an environmental perspective and therefore the technically preferred option takes preference. Alternative 1 (technically preferred) is therefore put forward for Environmental Authorisation.
- Considering the grid connection corridor assessed for the placement of the grid connection infrastructure the route is considered as preferred based on the fact that no significant environmental issues are associated with the corridor, and it provides the shortest and most technically feasible route for connection to the identified connection point along the existing national grid. The placement of the overhead line within the grid connection corridor must however still adhere to and avoid the depression wetland and its associated buffer.

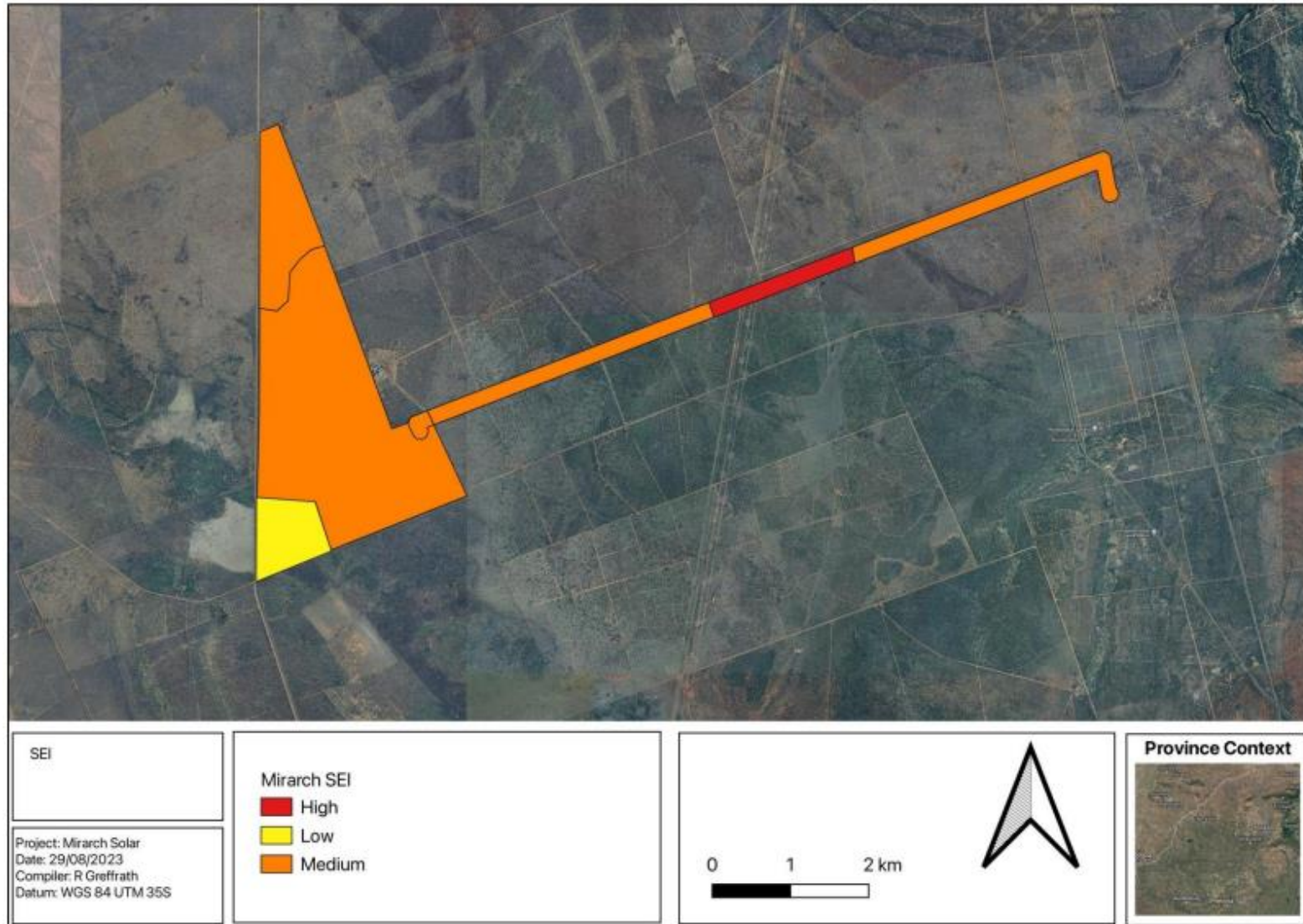


Figure 10.3: Ecological sensitivity associated with the Mirach Solar PV Project development footprint.

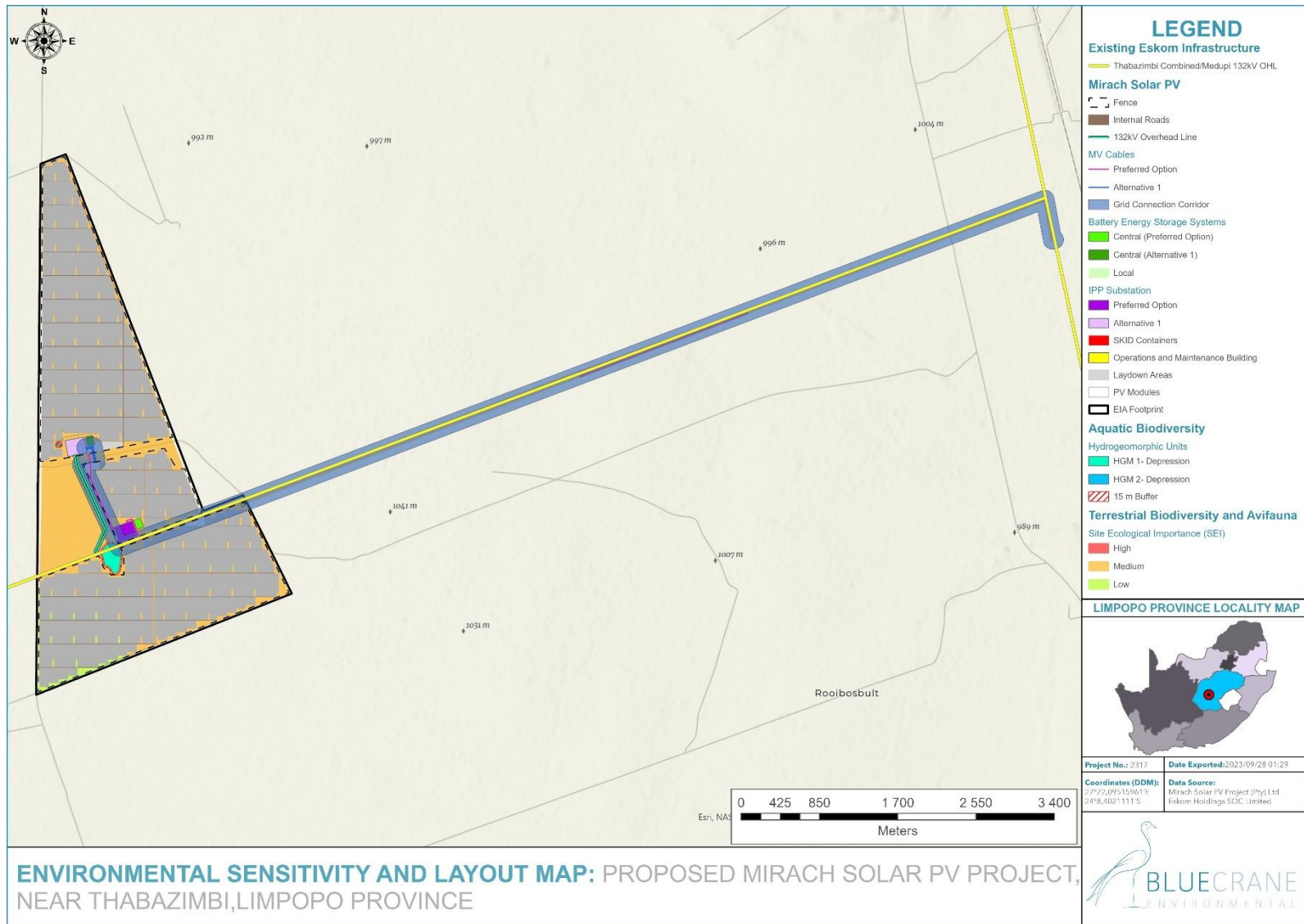


Figure 10.4: Optimised preferred layout map overlain by the environmental sensitivities. Also refer to Figure H3 appended.

10.2 Legal Requirements Complied with in Section 10 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report.	A motivation for the preferred development footprint is included in section 10.1.
3(1)(h)(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report.	A concluding statement indicating preferred development footprint is included in section 10.1 and Figure 10.3.
3(1)(n) the final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through assessment.	The final preferred alternatives considering the environmental sensitivities and mitigation measures are indicated in section 10.1.

11 CONCLUSION

The draft EIA Report was undertaken with the main aim of assessing the impacts that may occur with the development of the proposed Mirach Solar PV Project within the development area.

The development of a solar energy facility on a site located on the Farm Newcastle No. 53 as well as the associated required grid connection infrastructure may potentially result in both negative and positive environmental impacts that need to be mitigated to ensure that the development is appropriate from an environmental perspective. The entire extent of a 650 ha development footprint, and a grid connection corridor have been assessed as part of this draft EIA Report.

Key potential environmental impacts have been identified for the development through inputs provided from independent specialists. The impacts and the significance of the impacts listed below is without the implementation of the required mitigation measures.

11.1 Summary of Key Impacts

The Mirach Solar PV Project impact assessment highlights several key impacts across various aspects, including terrestrial biodiversity, wetland, avifauna, soil and agriculture, social, and heritage. Here is a summary of the key impacts and their significance:

Overall Environmental Impact:

- The project is expected to have medium to high environmental impact, especially during the construction phase. These impacts can be mitigated and reduced to an acceptable level through the implementation of the recommended mitigation measures.

Mitigation measures are crucial to prevent the total destruction of valuable natural resources, including indigenous vegetation and local fauna species.

Terrestrial Biodiversity Impact (Construction Phase):

- Destruction, loss, and fragmentation of habitats, ecosystems, and vegetation.
- Introduction of invasive alien plant species.

- Displacement of indigenous faunal communities.

These impacts can be mitigated to medium and low significance with recommended measures.

Terrestrial Biodiversity Impact (Operation Phase):

- Continuing spread of invasive plant species.
- Displacement and direct mortalities of faunal communities.

These Impacts can be mitigated to low significance through appropriate measures.

Wetland Impact:

- Moderate risk to wetlands due to construction and within the grid connection corridor.
- Depression wetlands (and recommended buffers) need to be avoided by the development footprint.

Mitigation measures can reduce risks and impacts to a low level, but some impacts are still expected.

Avifauna Impact:

- Negative impacts on avifauna due to construction and operation activities.
- Impacts include habitat loss, noise pollution, poaching and roadkill, collision and electrocution.
- Collision of avifauna with infrastructure considered to be the most significant impact. The impact significance will remain high following implementation of the recommended mitigation measures, however the impact is not considered unacceptable considering the environment within which the development is proposed.

Mitigation measures are recommended to reduce the significance of these impacts to acceptable levels.

Soil and Agriculture Impact:

- The impact of the Mirach Solar PV Project on agricultural land is considered acceptable.
- Agricultural sensitivity ranges from medium to low.

Mitigation measures include restricting land clearing and implementing stormwater management.

Social Impact:

- The construction phase may have social impacts related to the influx of non-local workforce, noise, dust, road wear, and safety risks.
- Operation phase impacts include both positive (employment, economic development) and negative (agricultural land loss, visual impacts).
- Decommissioning impacts are similar to construction.

Most impacts can be mitigated to low significance with proper planning.

Heritage Impact:

- No heritage sites were identified.

Impacts on heritage sites are expected to be low.

Palaeontological Impact:

- The development area is considered low in palaeontological sensitivity.
- Construction phase has a low post-mitigation significance.
- No significant impacts expected during operation and decommissioning phases.

No further studies or mitigation are required.

In conclusion, the impact assessment has indicated that with careful consideration and implementation of the recommended mitigation measures, the Mirach Solar PV Project is not expected to result in unacceptable high impacts that cannot be managed. However, careful planning and adherence to mitigation measures are essential to minimise adverse effects on the environment, biodiversity, wetlands, avifauna, agriculture and social aspects. No fatal flaws have been identified.

11.2 Preferred Development Footprint

An iterative process has been undertaken as part of the EIA process between the Applicant, EAP and independent specialists which included the sharing of information and solutions in terms of the environmental sensitivities and challenges present within the development footprint. The process considered optimisation of the development footprint within the

development area which has been fully assessed and considered as part of this draft EIA Report.

The Applicant has considered and implemented the recommendations made by the independent specialists and have adhered to and optimised the development footprint to a point where it is considered to be environmentally appropriate and acceptable for development, on the condition that all other recommended mitigation measures be implemented accordingly. This is in line with the mitigation hierarchy which has been applied as part of this EIA process.

It is therefore confirmed that the preferred development footprint (Figure 11.1 and Figure J) is put forward for decision-making on the Application for Environmental Authorisation.

Furthermore, it is confirmed that the following list of infrastructure is put forward for decision-making on the Application for Environmental Authorisation:

- PV Panel Array, including mounting structures, to enable the generation of up to 340 MW of electricity.
- Inverters and cabling are required to connect the PV array and to enable the conversion of direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Battery Energy Storage System (BESS) / facilities required for the storage of generated electricity.
- Site and internal access roads (up to 12 m wide). Roads are required to access the site, as well as internally to access the various project components.
- Grid connection infrastructure including:
 - 33 kV cabling between the project components and the facility substations;
 - A Loop-In-Loop-Out (LILO) connection with the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure;
 - A facility substation up to 132 kV;
 - A switching station up to 132 kV; and
 - A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Eskom Thabazimbi Combined / Waterberg 1 132 kV overhead power line infrastructure.
- Associated infrastructure is required in the form of auxiliary buildings (including basic services such as water and electricity). These include an operations and maintenance building / offices, switchgear and relay room, a gate house and security control,

control centre, workshops for storage and maintenance, staff lockers and changing room.

- Temporary and permanent laydown areas are also required.
- Temporary batching plant for construction purposes.
- For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farms.

Alternative 1 of the substation location and alternative 1 of the BESS location is put forward for Environmental Authorisation as part of the Mirach Solar PV Project.

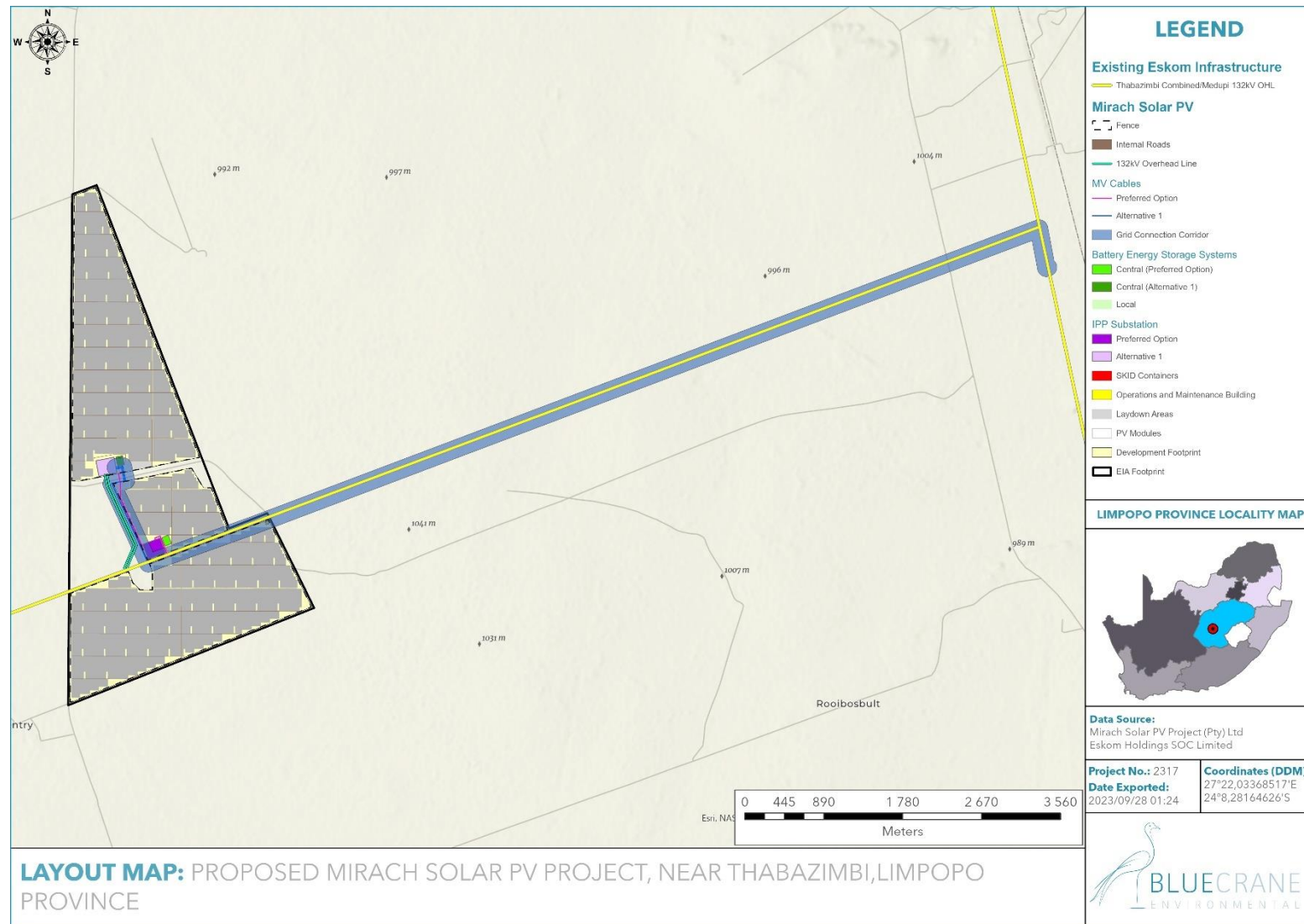


Figure 11.1: Optimised preferred development footprint / facility layout put forward for authorisation for the Mirach Solar PV Project.

11.3 Conditions of the EA

The following specific conditions are recommended for inclusion as part of the Environmental Authorisation, should this be awarded by the Department of Forestry, Fisheries and the Environment:

- All mitigation measures set out in the EMPr(s) must be implemented and adhered to.
- All mitigation measures set out in the specialist studies must be implemented and adhered to.
- All relevant national environmental laws and regulations relevant to the Mirach Solar PV Project must be adhered to.
- A detailed Geotechnical Assessment must be undertaken for the development footprint as part of the micro-siting of the layout.
- Authorisation in terms of the National Water Act (Section c & I, and possibly Section a) must be obtained for the water features present within the development footprint.
- A Stormwater Management plan must be designed and implemented for the development footprint.
- A heritage walk-through must be undertaken of the final power line route placed within the assessed grid connection corridor.
- The optimised preferred development footprint must be implemented as it avoids the environmental sensitive features present.
- Environmental Authorisation validity period of 10 years is requested.

11.4 Reasoned Opinion of the EAP

In determining whether the Mirach Solar PV Project should be authorised, a balanced assessment of its positive and negative impacts as revealed by the impact assessment must be considered. It's crucial to weigh the potential benefits of the project against its adverse effects on various aspects, including the environment, biodiversity, social factors, and heritage. It must also be considered whether the mitigation measures proposed are of such a degree that the impacts can be reduced to an acceptable level. Furthermore, it must be considered whether the Applicant has adhered to the requirements for avoidance of environmental sensitivities in the design and placement of infrastructure within the environment.

In conclusion, while the Mirach Solar PV Project presents both positive and negative impacts, the decision to authorise the project should be based on a thorough and balanced evaluation of these factors. The authorisation should be contingent on the effective implementation of mitigation measures and a commitment to minimising adverse effects while maximising its positive contributions to clean energy and economic development.

Considering the results of the impact assessment and the optimisation of the development footprint of the applicant, as well as the opportunities available to minimise the impacts through the implementation of mitigation measures, it is the reasoned opinion of the EAP that the Mirach Solar PV Project be awarded Environmental Authorisation, subject to the implementation of the recommended mitigation measures included in this draft EIA Report and the Environmental Management Programme (Appendix G).

Blue Crane Environmental therefore confirms the suitability of the Mirach Solar PV Project within the assessed development area.

11.5 Legal Requirements Complied with in Section 11 as per the Requirements of the EIA Regulations, 2014 (as amended)

This section of the report includes the following information required in terms of Appendix 3: Scope of assessment and content of the environmental impact assessment reports:

Requirement	Relevant Section
3(1)(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment.	A summary of the key impacts, including positive and negative impact, associated with the Mirach Solar PV Project is included in section 11.1.
3(1)(l) an environmental impact statement which contains (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 development footprint on the approved site as contemplated in the accepted scoping	The preferred development footprint map which has been optimised to consider the environmental sensitivities and associated buffers is included in section 11.2.

report indicating any areas that should be avoided, including buffers.	
3(1)(l) an environmental impact statement which contains (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	A summary of the key impacts, including positive and negative impacts, associated with the Mirach Solar PV Project is included in section 11.1.
3(1)(o) 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.	Conditions to the Mirach Solar PV Project Environmental Authorisation is included in section 11.3.
3(1)(q) 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.	The reasoned opinion of the EAP regarding the approval or refusal of the Mirach Solar PV Project is included in section 11.4.
3(1)(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised.	<p>The period for which the environmental authorisation is required is included in section 11.3.</p> <p>It is however not possible to indicate the date on which the activity will be concluded and the date on which the post construction monitoring requirements finalised as the development is intended to be bid as part of the REIPPP programme.</p>

12 REFERENCES

ACTS see SOUTH AFRICA

ANON. nd. Guidelines for Environmental Impact Assessments. <http://redlist.sanbi.org/eiaguidelines.php>

BANZAI ENVIRONMENTAL. (2023). Palaeontological Desktop Assessment for the proposed Mirach Solar PV Project near Thabazimbi, Limpopo Province

BODEN, T.A., G. MARLAND, and R.J. ANDRES. 2011. Global, Regional, and National Fossil-Fuel CO₂ Emissions. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., U.S.A.

CONSTITUTION see SOUTH AFRICA. 1996.

DEPARTMENT OF ENERGY (DoE). Integrated Resource Plan 2010-2030

DEPARTMENT OF MINERALS AND ENERGY (DME). 2003. White Paper on Renewable Energy.

DONAWAY ENVIRONMENTAL. (2023). Visual Impact Assessment: The Proposed Mirach Solar PV Project near Thabazimbi, Limpopo Province.

DONAWAY ENVIRONMENTAL. (2023). Social Impact Assessment: The Proposed Mirach Solar PV Project near Thabazimbi, Limpopo Province.

ENERGY BLOG. 2015. Energy Blog – Project Database. [Web:] <http://www.energy.org.za/knowledge-tools/project-database?search=projectlookup&task=search> [Date of assess: 28 September 2015].

ENVIRONAMICS. (2023). Final Scoping Report: The Proposed Mirach Solar PV Project near Thabazimbi, Limpopo Province.

FIRST SOLAR. 2011. PV Technology comparison.

INTERNATIONAL FINANCE CORPORATION (IFC). 2012. International Finance Corporation's Policy on Environmental and Social Sustainability.

IFC & WORLD BANK GROUP. 2007. Environmental, Health, and Safety General Guidelines.

MUCINA, L. AND RUTHERFORD, M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

NATIONAL DEPARTMENT OF AGRICULTURE. 2006. Development and Application of a Land Capability Classification System for South Africa.

NERSA. 2009. South Africa Renewable Energy Feed-in Tariff (REFIT) – Regulatory Guidelines.

SANBI. 2016. Guidelines for Environmental Impact Assessments. [Web:] <http://redlist.sanbi.org/eiaguidelines.php>. Date of access: 26 April 2016.

SOLARGIS. 2011. Global Horizontal Irradiation (GHI). [Web:] <http://solargis.info/doc/71> [Date of access: 7 May 2014].

SOUTH AFRICA (a). 1998. The Conservation of Agricultural Resources Act, No. 85 of 1983. Pretoria: Government Printer.

SOUTH AFRICA. 1996. Constitution of the Republic of South Africa as adopted by the Constitutional Assembly on 8 May 1996 and as amended on 11 October 1996. (B34B-96.) (ISBN: 0-260-20716-7.)

SOUTH AFRICA (a). 1998. The National Environmental Management Act, No. 107 of 1998. Pretoria: Government Printer.

SOUTH AFRICA (b). 1998. The National Water Act, No. 36 of 1998. Pretoria: Government Printer.

SOUTH AFRICA. 1999. The National Heritage Resources Act, No. 25 of 1999. Pretoria: Government Printer.

SOUTH AFRICA. 2004. The National Environment Management: Air Quality Act, No. 39 of 2004. Pretoria: Government Printer.

SOUTH AFRICA (a). 2008. The National Energy Act, No. 34 of 2008. Pretoria: Government Printer.

SOUTH AFRICA (b). 2008. The National Environmental Management: Waste Act, No. 59 of 2008. Pretoria: Government Printer.

SOUTH AFRICA. 2010. Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998. (GNR. 543, 544 and 545. 2010.). Pretoria: Government Printer.

SOUTH AFRICA. Minister in the Presidency: Planning (2009). Medium Term Strategic Framework. – A Framework to guide Governments Programme in the Electoral Mandate Period 2009-2014.

SWINGLER, S. 2006. Statistics on Underground Cable in Transmission networks, Final Report of CIGRE Working Group B1.07.

WORLD BANK GROUP. 2006. The Equator Principles.

THE BIODIVERSITY COMPANY. (2023). Avifauna Impact Assessment for the proposed Mirach Solar Photovoltaic (PV) Project, Limpopo.

THE BIODIVERSITY COMPANY. (2023). Soil and Agricultural Compliance Statement for the proposed Mirach Solar Photovoltaic Project, Limpopo.

THE BIODIVERSITY COMPANY. (2023). Terrestrial Ecology Baseline and Impact Assessment for the proposed Mirach Solar Photovoltaic (PV) Project, Limpopo.

THE BIODIVERSITY COMPANY. (2023). Wetland Baseline and risk Assessment for the proposed Mirach Solar PV Project, Limpopo.

VAN SCHALKWYK, J. A. (2023). Phase 1 Cultural Heritage Impact Assessment: The Development of the Proposed Mirach Solar PV Project near Thabazimbi, Limpopo Province.