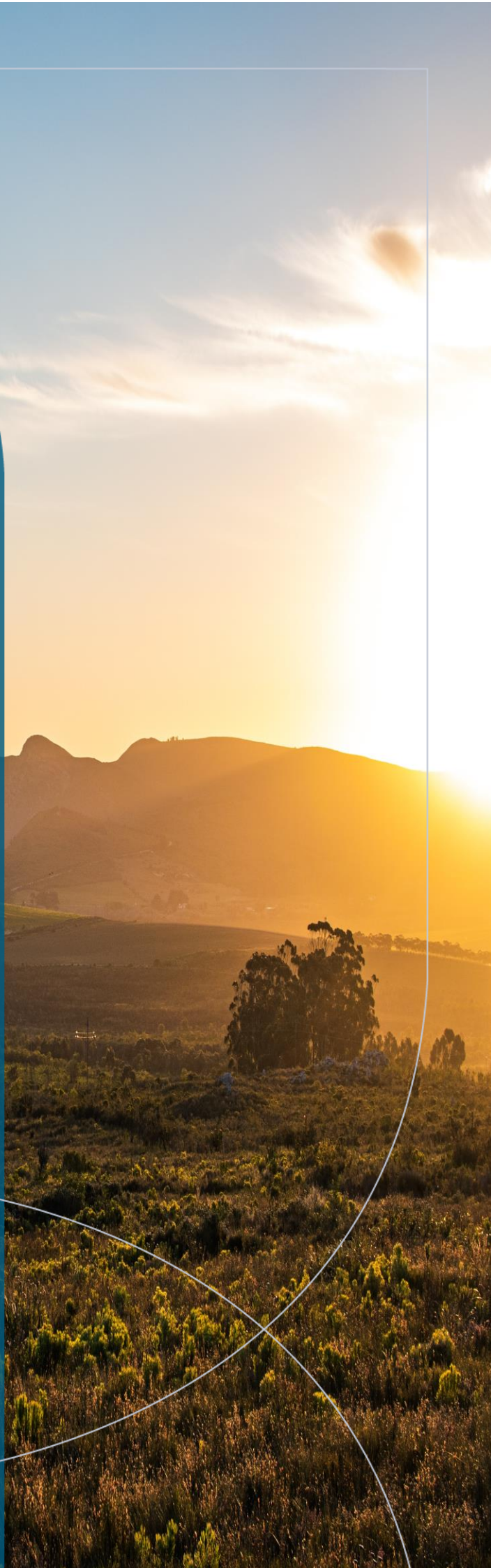
DRAFT SCOPING REPORT

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FOR THE PROPOSED ACRUX SOLAR PV PROJECT TWO, NEAR BLOEMFONTEIN, FREE STATE PROVINCE

04 JULY 2023



BLUECRANE ENVIRONMENTAL

PROJECT DETAILS

DFFE Reference Number	:	2023-04-0011
Project Title	:	The Proposed Acrux Solar PV Project Two near Bloemfontein, Free State Province
Authors	:	Roschel Maharaj and Lisa de Lange
Consultancy	:	Blue Crane Environmental (Pty) Ltd
Registered EAP	:	Roschel Maharaj (2019/824)
Applicant	:	Acrux Solar PV Project Two (Pty) Ltd
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GLOSSARY OF TERMS AND ACRONYMS

CEA	Cumulative Effects Assessment
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
EPFI	Equator Principles Financial Institutions
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
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 IPP Procurement Process
SAHRA	South African Heritage Resources Agency
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
S&EIA	Scoping and EIA Process
SPP	Solar Power Plant
VU	Vegetation Unit

INVITATION TO COMMENT

Acrux Solar PV Project Two (Pty) Ltd is proposing the development of a photovoltaic solar facility and associated infrastructure (including grid connection infrastructure) for the purpose of commercial electricity generation on an identified site located on the Remaining Extent of Portion 1 of Farm Spes Bona No. 2355, Portion 10, of Farm Spes Bona No. 2355, and the Remaining Extent of the Farm Wolfkop 2353, Registration Division Bloemfontein RD, Free State Province situated within the Mangaung Metropolitan Municipality area of jurisdiction.

Blue Crane Environmental (Pty) Ltd has been appointed as the independent environmental consultant to undertake the required Environmental Impact Assessment Process (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 Acrux Solar PV Project Two 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 Scoping 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, 04 July 2023 to Thursday, 03 August 2023**.

This report therefore represents the findings of the Scoping 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 Description and Site Selection Process** - provides a description of all project related details, including alternatives and the process followed by the Applicant for site selection.
- **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, as well as the Public Participation Process followed.
- **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 (including cumulative impacts) associated with the development and provides recommendations for the mitigation of significant impacts.
- **Section 9: EIA Plan of Study** - provides the plan to be followed for the EIA Phase of the process.
- **Section 10: Conclusion** - presents the conclusions and recommendations based on the findings of the draft Scoping Report.

EXECUTIVE SUMMARY

Acrux Solar PV Project Two (Pty) Ltd intends to develop a 650 MW photovoltaic solar facility and associated infrastructure on the Remaining Extent of Portion 1 of Farm Spes Bona No. 2355, Portion 10, of Farm Spes Bona No. 2355, and the Remaining Extent of the Farm Wolfkop 2353 situated within the Mangaung Metropolitan Municipality, area of jurisdiction. The City of Bloemfontein is located approximately 14 km east of the proposed development.

Blue Crane Environmental (Pty) Ltd has been appointed to undertake the Scoping and EIA Process for the proposed development. Activities required for the development of the solar energy facility which are listed under Listing Notice 1, 2 and 3 (GNR 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).

This is the draft Scoping Report that has been made available to I&APs for a 30-day review and comment period. Potentially sensitive areas have been identified through the Scoping Phase and provides a high-level overview of the sensitivity on the Acrux Solar PV Project Two Development Area. The detail is based on the desktop review of available baseline information for the Development Area, as well as the sensitivity data received from specialist studies undertaken during the Scoping Phase.

Based on the high-level 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 Scoping Report, are briefly summarised below.

Predicted impacts during the construction phase:

During the construction phase minor negative impacts are foreseen over the short term. The latter refers to a period of up to 20 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 operation phase the site will serve as a solar PV energy facility and the potential impacts will take place over a period of 25 – 30 years. The negative impacts are generally associated with habitat destruction caused by clearance of vegetation, 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 passed the proposed facility. 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.

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, there are thirteen (13) similar developments that have been proposed in close proximity to the proposed activity.

It is recommended that the competent authority approve the Scoping Report and Plan of Study for the EIA so that the Application may move forward to the EIA Phase. This is based on the fact that no fatal flaws have been identified for the development of the Acrux Solar PV Project Two, as well as the potential opportunity to avoid, manage and mitigate the impacts associated with the proposed development.

1 INTRODUCTION

Acrux Solar PV Project Two (Pty) Ltd intends to develop a 650 MW photovoltaic solar facility and associated infrastructure on the Remaining Extent of Portion 1 of Farm Spes Bona No. 2355, Portion 10, of Farm Spes Bona No. 2355, and the Remaining Extent of the Farm Wolfkop 2353 situated within the Mangaung Metropolitan Municipality, area of jurisdiction. The City of Bloemfontein is located approximately 14 km east of the proposed development (refer to Figure A and B for the locality and regional map).

A development area[1] / site of up to 2000 hectares (including supporting infrastructure) has been identified for assessment as part of the Environmental Impact Assessment (EIA) process, which is fully assessed as part of this draft Scoping Report. Two 200 m wide and ~6 km long grid connection corridors are also under assessment for the placement of the overhead power line. The physical development footprint of the preferred grid connection corridor will be further reduced and restricted to power line pylon footprints only.

The site was identified 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 the N8 and N1 (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

1.1 Project Overview

For the development of Acrux Solar PV Project Two 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 to enable the generation of 650 MW of electricity.
- Inverters and cabling are required to connect the PV array and thereby enabling the conversion of direct current (DC) electricity to alternating current (AC) electricity at grid frequency.
- Grid connection infrastructure is required to connect the PV array to the electrical grid. This requires the transformation of the voltage from 480 V up to 33 kV and 132 kV. The grid connection infrastructure required includes two on-site facility substations (collector) and two switching stations and a single or double circuit overhead power line. The grid connection point for the Acrux Solar PV Project Two is the existing Harvard Substation.
- Two Battery Energy Storage System / facilities are required for the storage of generated electricity.
- Supporting infrastructure is required in the form of axillary buildings (including basic services such as water and electricity). These include Operations & Maintenance Building / Office, switch gear and relay room, staff lockers and changing room, security control and offices.
- Temporary and permanent laydown areas are also required.
- Roads are required to access the site, as well as internally to access the various project components.

[1] The development area is defined as the area within the affected properties under assessment for the placement of the development footprint which will house all infrastructure associated with the development. The final development footprint will only be defined within the EIA phase of the process.

- 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. 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 soon 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 Acrux Solar PV Project Two (Pty) Ltd is proposing the development of the proposed photovoltaic solar 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 Acrux Solar PV Project Two is subject to the requirements of the EIA Regulations, 2014 (as amended), published in terms of Section 24(5) of the National Environmental Management Act[2] (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

[2] NEMA is the national legislation that provides for the authorisation of certain controlled activities known as "listed activities".

facility will have a capacity of up to 650 MW. Table 1.1 below indicates all listed activities triggered in terms of the EIA Regulations and provide 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:
GNR. 327 (as amended in 2017)	Activity 11(i)	• "The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts". • Activity 11(i) is triggered since the proposed solar PV facility includes substation components namely two a on-site HV/MV substations, which will act as a collector substation, and two switching substations with a capacity of up to 132kV each. Energy generated from the facility will be transmitted to an existing Eskom facility substation via a 132 kV overhead power line. Two grid connection corridors are under assessment for the placement of the overhead power line.
GNR. 327 (as amended in 2017)	Activity 12(ii)(c)	• "The development of (ii) infrastructure or structures with a physical footprint of 100 square metres or more; (c) within 32 meters of a watercourse measured from the edge of a watercourse." • Activity 12(ii)(c) is triggered as the PAOI overlaps with a single depression wetland listed as Least Threatened (LT). The PAOI further overlaps with unclassified FEPA wetlands, while several FEPA wetland types are located within the PAOI.
GNR. 327 (as amended in 2017)	Activity 14	• "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." • The use of hazardous substances will form part of the construction phase. The substances anticipated to be used includes 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 at registered hazardous waste sites. The storage requirements are not expected to exceed 500 cubic metres.
GNR. 327 (as amended in 2017)	Activity 24(ii)	• "The development of a road (ii) with reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters". • Activity 24(ii) is triggered as the proposed main access road to Acrux Solar PV Project Two 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.
GNR. 327 (as amended in 2017)	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". • Activity 28(ii) is triggered as the total area to be developed for the PV facility and associated infrastructure is greater than 1ha and occurs outside an urban area in an area currently zoned for agriculture. The property will be re-zoned to "special" use.
GNR. 327 (as amended in 2017)	Activity 56 (ii):	• "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…" • Activity 56 (ii) is triggered as existing roads may require widening of up to 6 m and/or lengthening by more than 1 km, to accommodate the movement of heavy vehicles and cable trenching activities.
GNR. 325 (as amended in 2017)	Activity 1	• "The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more". • Activity 1 is triggered since the proposed solar PV facility will generate up to 650 megawatts of electricity through the use of a renewable resource.
GNR. 325 (as amended in 2017)	Activity 15	• "The clearance of an area of 20 hectares or more of indigenous vegetation." • 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 development area is approximately 2000 ha.
GNR. 324 (as amended in 2017)	Activity 4 (b)(i)(bb)(ee)(gg)	• "The development of a road wider than 4 metres with a reserve less than 13,5 metres within (b) Free State, (i) Outside urban areas (bb) National Protected Area Expansion Strategy Focus areas (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans (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 reserve, excluding disturbed areas."

		• Activity 4 (b)(i)(bb)(ee)(gg) is triggered as internal and perimeter access roads with a width of between 6 and 10 meters will be constructed. The PAOI is located within 5 km of the Free State Highveld Grasslands NPAES focus area. In terms of NPAES PA Negotiated Focus Areas 2018, the PAOI is located within 5 km of Priority Focus Areas and Protected Area. The PAOI overlaps with a CBA 1 and is located within 5 km of the Highlands Reserve and Olievenkloof Private Nature Reserve.
GNR. 324 (as amended in 2017)	Activity 10 (b)(i)(bb)(ee)(gg)(hh)	• "The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres (b) Free State, (i) Outside urban areas (bb) National Protected Area Expansion Strategy Focus areas (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans (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 reserve, excluding disturbed areas (hh) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland." • Activity 10(b)(i)(hh) is triggered since the proposed development will need to develop infrastructure for the storage and handling of dangerous goods (diesel and/or oils) in containers with a capacity exceeding 30 but not exceeding 80 cubic metres. The PAOI is located within 5 km of the Free State Highveld Grasslands NPAES focus area. In terms of NPAES PA Negotiated Focus Areas 2018, the PAOI is located within 5 km of Priority Focus Areas and Protected Area. The PAOI overlaps with a CBA 1 and is located within 5 km of the Highlands Reserve and Olievenkloof Private Nature Reserve. The PAOI overlaps with a single depression wetland listed as Least Threatened (LT). The PAOI further overlaps with unclassified FEPA wetlands, while several FEPA wetland types are located within the PAOI.
GNR. 324 (as amended in 2017)	Activity 12 (b)(ii)(iv)	• "The clearance of an area of 300 square metres or more of indigenous vegetation (b) Free State (ii) Within critical biodiversity areas identified in bioregional plans (iv) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland". • Activity 12 (b)(ii)(iv) is triggered since the project is located within the Free State Province. The PAOI overlaps with a single depression wetland listed as Least Threatened (LT). The PAOI further overlaps with unclassified FEPA wetlands, while several FEPA wetland types are located within the PAOI. The site overlaps with a CBA 1.

GNR. 324 (as amended in 2017)	Activity 14(ii)(c)(b)(i)(bb) (ff)(hh)	• "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 (b) Free State, (i) Outside urban areas (bb) National Protected Area Expansion Strategy Focus areas (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans (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." • Activity 14(ii)(a)(c)(b)(i)(ff) is triggered since the PAOI is located within 5 km of the Free State Highveld Grasslands NPAES focus area. In terms of NPAES PA Negotiated Focus Areas 2018, the PAOI is located within 5 km of Priority Focus Areas and Protected Area. The PAOI overlaps with a CBA 1 and is located within 5 km of the Highlands Reserve and Olievenkloof Private Nature Reserve. The PAOI overlaps with a single depression wetland listed as Least Threatened (LT). The PAOI further overlaps with unclassified FEPA wetlands, while several FEPA wetland types are located within the PAOI.
GNR. 324 (as amended in 2017)	Activity 18 (b)(i)(bb) (ee)(hh)	• "The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre (b) Free State (i) Outside urban areas(bb) National Protected Area Expansion Strategy Focus areas (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the Competent Authority or in bioregional plans (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 reserve (hh) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland." • Activity 18 (b)(i)(bb)(ee)(hh) is triggered as the existing access to the affected property does not have a reserve and will need to be widened by more than 4 metres. The PAOI is located within 5 km of the Free State Highveld Grasslands NPAES focus area. In terms of NPAES PA Negotiated Focus Areas 2018, the PAOI is located within 5 km of Priority Focus Areas and Protected Area. The PAOI overlaps with a CBA 1 and is located within 5 km of the Highlands Reserve and Olievenkloof Private Nature Reserve. The PAOI overlaps with a single depression wetland listed as Least Threatened (LT). The PAOI further overlaps with unclassified FEPA wetlands, while several FEPA wetland types are located within the PAOI.

Appendix 2 of the EIA Regulations, 2014 (as amended), contains the objectives to be achieved through the undertaking of a Scoping process. The following objectives have been considered, undertaken and achieved through a consultative process within this draft Scoping Report for the Acrux Solar PV Project Two:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an identification of impacts and risks and ranking process of such impacts and risks;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the 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 (GNR 326), Acrux Solar PV Project Two (Pty) Ltd has appointed Blue Crane Environmental (Pty) Ltd (Blue Crane Environmental) as the independent Environmental Assessment consultant to undertake the Environmental Impact Assessment process and prepare the draft Scoping Report for the proposed development. Neither Blue Crane Environmental nor any of the appointed independent specialists are subsidiaries of, or are affiliated to Acrux Solar PV Project Two (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 summarized in the curriculum vitae included as part of Appendix A.

The details of the Registered EAP is as follows:

Table 1.2: Details of the Registered EAPs

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

Regulation 13(1)(a) and (b) determines that an independent and suitably qualified, experienced and independent specialist should conduct the specialist study, 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 E7 to this report. The expertise of the specialists is summarized 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	Tel	E-mail
Ecological Impact Assessment	The Biodiversity Company	Andrew Husted	Cell: 081 319 1225	info@thebiodiversitycompany.com
Avifaunal Impact Assessment	The Biodiversity Company	Andrew Husted	Cell: 081 319 1225	info@thebiodiversitycompany.com
Wetland Baseline and Risk Assessment	The Biodiversity Company	Andrew Husted	Cell: 081 319 1225	info@thebiodiversitycompany.com
Soil and Agricultural Impact Assessment	The Biodiversity Company	Andrew Husted	Cell: 081 319 1225	info@thebiodiversitycompany.com
Heritage Impact Assessment	J van Schalkwyk Heritage Consultant	J van Schalkwyk	Cell: 076 790 6777	jvschalkwyk@mweb.co.za
Paleontological Study	Banzai Environmental (Pty) Ltd	Elize Butler	Cell: 084 447 8759	elizebutler002@gmail.com
Social Impact Assessment	Donaway Environmental Consultants	Johan Botha	Cell: 082 493 5166	johan@donaway.co.za
Visual Impact Assessment	Donaway Environmental Consultants	Johan Botha	Tel: 082 316 7749	johan@donaway.co.za

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable to the draft Scoping 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 is a technically suitable site for the establishment of Acrux Solar PV Project Two and associated infrastructure.
- It is assumed that the development of Acrux Solar PV Project Two at the preferred site/ development area would provide for a grid connection solution which is both feasible and viable, and that the developer has consulted / is in the process of consulting with Eskom in this regard.
- Conclusions of independent specialist studies undertaken and this draft Scoping Report assume that any potential impacts on the environment associated with the proposed development will be avoided, mitigated, or offset.
- It is assumed that the Applicant will consider and avoid all sensitive areas and environmental features not conducive for the placement of infrastructure.
- This draft Scoping Report and its investigations/ results are project-specific, and therefore no other power generation alternatives have been considered.

Refer to the specialist studies provided in Appendices E1-E10 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 Scoping 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 2: Content of the scoping report:

Requirement	Relevant Section
2(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.
2(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.
2(i) an undertaking under oath or affirmation by the EAP in relation to (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties.	The Declaration of the EAP and undertaking under oath is included in Appendix A.

2(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.	The Declaration of the EAP and undertaking under oath is included in Appendix A.

2 PROJECT DESCRIPTION AND SITE SELECTION PROCESS

This section provides the details of the project proposed including the project infrastructure and alternatives. Furthermore, the section considers the site selection process and approach undertaken by the Applicant for the Acrux Solar PV Project Two.

2.1 Location of the proposed development

A development area of 2000 ha has been identified within three affected properties for the placement of the development footprint which ultimately house the Acrux Solar PV Project Two. The location information related to the grid connection infrastructure is also provided. The details of the location is included in Table 2.1 below.

Table 2.1: General site and location information

Description of affected farm portions	Solar PV Facility: • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 • Portion 10 of Farm Spes Bona No. 2355 • Remaining Extent of the Farm Wolfkop No. 2353 Solar Grid Infrastructure – Alternative 1: • Portion 10 of Farm Spes Bona No. 2355 • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 • Remaining Extent of Farm Wolfkop No. 2353 • Remaining Extent of Farm Arizona No. 2605 • Farm Elizabeth No. 2603 • Farm Goeie Hoop No. 2604 • Remaining Extent of Farm Content No. 1167 • Remaining Extent of Farm Kwaggafontein No. 23000 Solar Grid Infrastructure – Alternative 2: • Portion 10 of Farm Spes Bona No. 2355 • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 • Portion 7 of Farm Spes Bona No. 2355 • Portion 11 of Farm Spes Bona No. 2355 • Remaining Extent of Farm Kwaggafontein No. 23000 Access Road: • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 • Remaining Extent of Farm Wolfkop No. 2353

Province	Free State
Municipality	Mangaung Metropolitan Municipality
Ward numbers	Ward 48
Closest towns	Bloemfontein is located approximately 14 km east of the proposed development.
21 Digit Surveyor General codes	Solar PV Facility: • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 - F00300000000235500001 • Portion 10 of Farm Spes Bona No. 2355 - F00300000000235500010 • Remaining Extent of Farm Wolfkop No. 2353 - F00300000000235300000 Solar Grid Infrastructure – Alternative 1: • Portion 10 of Farm Spes Bona No. 2355 - F00300000000235500010 • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 - F00300000000235500001 • Remaining Extent of Farm Wolfkop No. 2353 - F00300000000235300000 • Remaining Extent of Farm Arizona No. 2605 F00300000000260500000 • Farm Elizabeth No. 2603 - F00300000000260300000 • Farm Goeie Hoop No. 2604 F00300000000260400000 • Remaining Extent of Farm Content No. 1167 F00300000000116700000 • Remaining Extent of Farm Kwaggafontein No. 23000 F00300000000230000000 Solar Grid Infrastructure – Alternative 2: • Portion 10 of Farm Spes Bona No. 2355 - F00300000000235500010 • Portion 7 of Farm Spes Bona No. 2355 - F00300000000235500007 • Portion 11 of Farm Spes Bona No. 2355 - F00300000000235500011 • Remaining Extent of Farm Kwaggafontein No. 23000 - F00300000000230000000 Access Road: • Remaining Extent of Portion 1 of Farm Spes Bona No. 2355 - F00300000000235500001

	• Remaining Extent of Farm Wolfkop No. 2353 - F00300000000235300000
Area under assessment (Development Area)	2000 ha
Photographs of the site	Included in Plates as an appendix to the Report

The total area assessed comprises of approximately 2000 ha (Development Area) proposed for the PV facility (including supporting infrastructure, excluding grid connection). Two 200 m wide and 6 km long grid connection corridors are also under assessment for the placement of the overhead power line. The full extent of the development area and grid connection corridors has been considered as part of this draft Scoping Report with the aim of confirming the suitability of the area from an environmental and social perspective and thereby to enable the identification of a suitable development footprint. The development footprint will be defined based on the outcomes of the scoping phase and will be further assessed in the EIA phase, which will include the assessment of a detailed facility layout.

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

The area surrounding Acrux Solar PV Project Two is characterised mostly by agricultural development except to the east where large scale urban development is present, which is the town of Bloemfontein. The development is located adjacent to the proclaimed Highlands Nature Reserve, but after further investigation, the Visual Impact Assessment (Appendix E2) confirms that the reserve is only being used for cultivation farming with very low to no tourism potential. Refer to plates 1 – 8 for photographs of the affected property and assessment area.

2.2 Details of the infrastructure proposed

The development footprint associated with Acrux Solar PV Project Two will include 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 effect[3]. 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.

In terms of the S&EIA process currently underway for Acrux Solar PV Project Two, the layout plan/development footprint will only become available following the completion of the Scoping Phase as the Applicant requires the results (including the locations of all sensitive environmental features and areas not suitable for the placement of infrastructure) to consider the suitability of the development area for the placement of the development footprint.

[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.

The design of the detailed layout will however consider and adhere to the limitations of the development area and aspects such as environmentally sensitive areas, roads, fencing and servitudes on site– refer to Figure K. The total surface area proposed for the layout will include the PV panel arrays (spaced to avoid shadowing), access and maintenance roads and associated infrastructure (buildings, power inverters, power line, battery energy storage systems, on-site substations and switching substations and perimeter fences).

Table 2.2 below provide the technical details of the Acrux Solar PV Project Two available at the Scoping Phase of the development.

Table 2.2: Technical details of the proposed infrastructure for Acrux Solar PV Project Two

Component	Description / dimension
Type of technology	Photovoltaic solar facility
Generation capacity	Up to 650 MW
Area of the PV Array	To be confirmed once the development footprint is available. Will be located within the 2000 ha development area.
Structure orientation	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 is 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.
Structure Height	• Panels up to 5 m • Buildings up to 12 m • Power line up to 30 m • Fencing up to 3 m
Area of the Battery Storage	Within a 5 ha area or spread out within the facility next to the inverters. The infrastructure will be located within the development footprint. At this stage two Battery Storage facilities are proposed to be developed as part of the

	development footprint. This will however only be confirmed during the EIA Phase.
Capacity of the Battery Storage	500 MWh, but depends on the technology at the time of construction
Area of the facility substation, switching station and collector substation	Two on site facility substations and two switching stations are proposed. The relevant areas per component is: • On-site facility substation (collector): up to 2 ha • Switching Station (Eskom): up to 2 ha
Capacity of the facility substation, switching station and collector substation	Two on site facility substations and two switching stations are proposed. The relevant capacity per component is: • On-site facility substation (collector): 132 kV • Switching Station (Eskom): 132 kV
Length and width of the two grid connection corridors	• Up to 6 km long • 200 m wide
Capacity of the power line	Single or double circuit line with a capacity of 132 kV
Power line servitude width	Up to 36 m
Laydown area dimensions	Temporary laydown areas will occupy up to 30 hectares while 10 hectares will remain in place for the permanent laydown areas as required for facility operation. The final extents will however be confirmed in the EIA phase once the development footprint is available.
Area occupied by buildings	An area of up to 5 ha will be occupied by buildings which will include operations and maintenance building and offices; switch gear and relay room; staff lockers and changing room and security control building.
Width of internal roads	Up to 12m wide
Length of internal roads	Up to 40 km in total

A draft layout has been provided by the Applicant for assessment as part of the Scoping Phase. The draft layout shows the development area of 2000 ha with an indication of the placement of infrastructure such as substations, BESS and laydown areas. Refer to Figure 2.1 below.

However as this is only the Scoping Phase of the EIA process the Applicant has indicated that an optimisation approach will be followed once the Scoping Phase is completed 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 assessed in the EIA phase.

It is therefore confirmed that the coordinates associated with Acrux Solar PV Project Two and the specific project components, such as substations, BESS and PV array, will only become available in the EIA Phase and will therefore be included in the draft EIA Report.

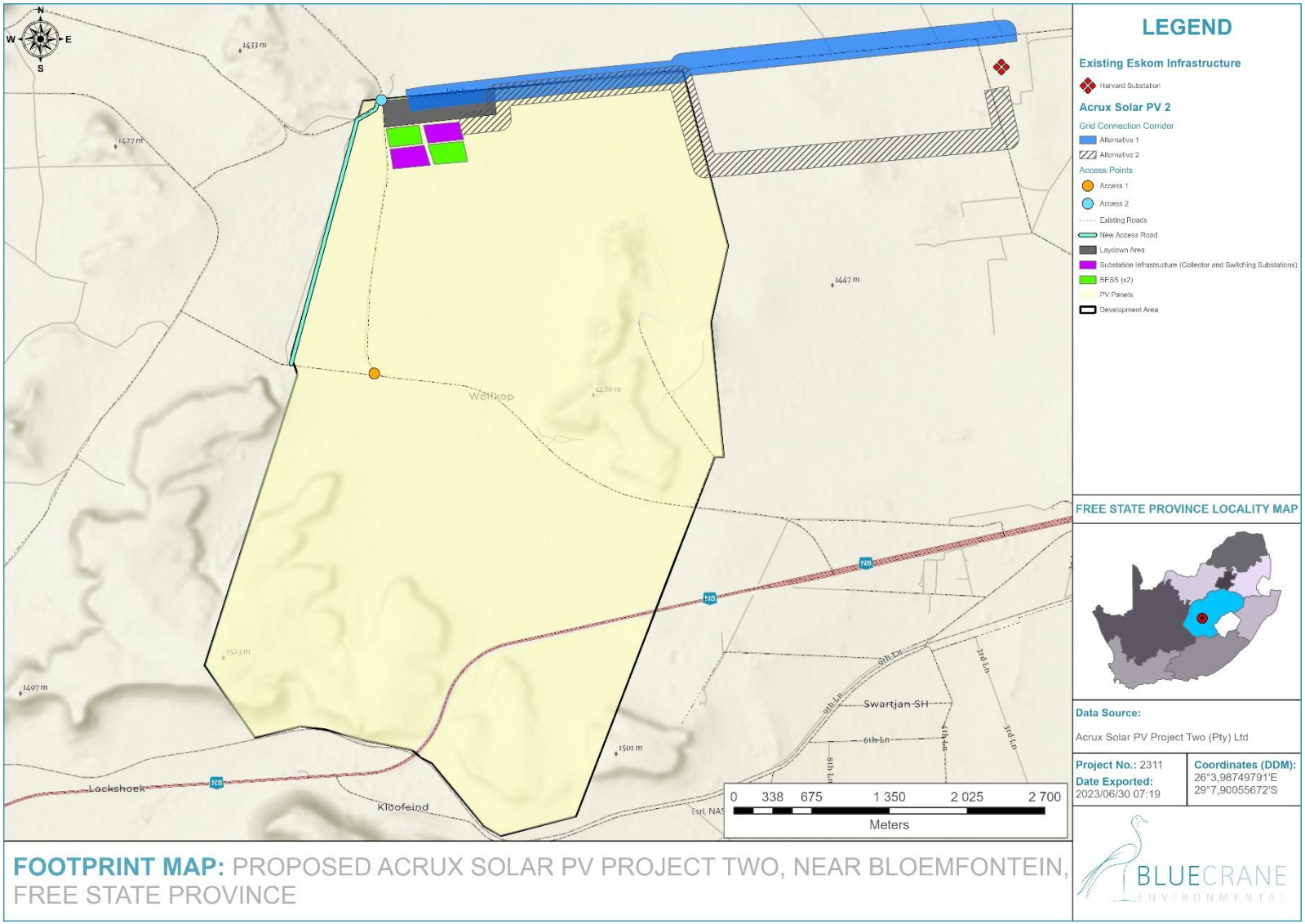

Figure 2.1: Draft layout plan for Acrux Solar PV Project Two assessed as part of this draft Scoping Report

2.3 Site Selection Process

The process undertaken by the Applicant for the identification of the preferred site was through an investigation of prospective sites and properties in the Bloemfontein area. The investigation involved the consideration of specific characteristics within the Free State Province and specifically within the Bloemfontein 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. 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.

- *Solar Resource* - The Applicant firstly considered the available solar resource for the Free State and the Bloemfontein area through the consideration of various datasets and variables. Through the consideration of the datasets, involving the global horizontal irradiation values of South Africa, as well as meteorological information and geographical factors it was confirmed that the Bloemfontein area, and in particular the Acrux Solar PV Project Two site, is suitable for the development of a solar facility. See Figure 2.2.

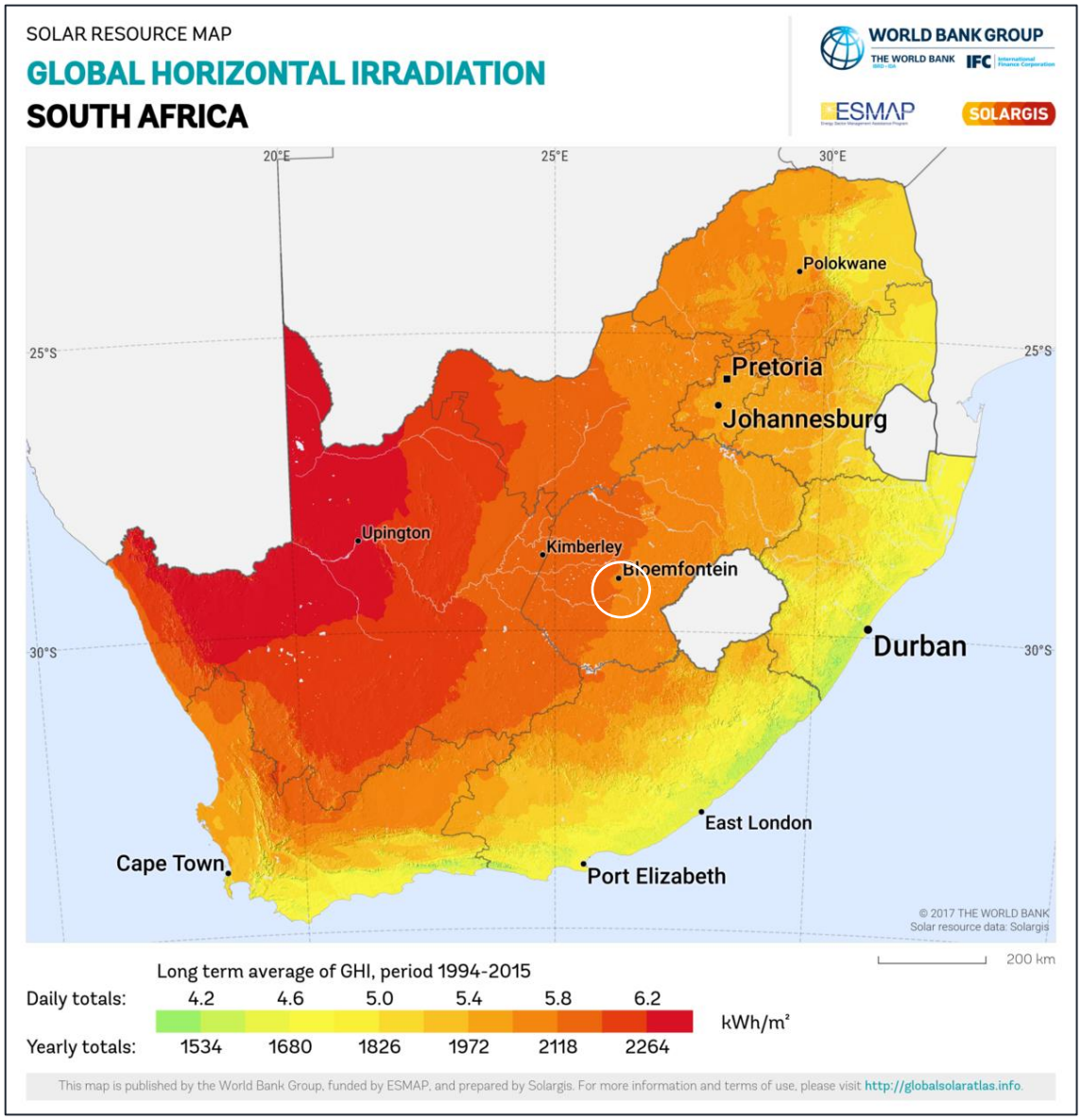

Figure 2.2: Global horizontal irradiation values for South Africa (Solar GIS, 2021) and the Acrux Solar PV Project Two development area

- *Land Availability* – In order to develop the Acrux Solar PV Project Two with a contracted capacity of up to 650 MW sufficient space is required for the placement of infrastructure. The site was identified within the Free State Province and in the Bloemfontein area following the confirmation of the solar resource. The properties included in the site / development area are some of the few available privately-owned parcels in the area that can be developed and are available. The combination of the extent of the affected properties enables the consideration of a very large development area (i.e., 2000 ha) for the assessment and placement of the development footprint. Furthermore, the willingness of the respective landowners to consent to the development on the affected properties was also considered by the Applicant.

- *Access to the National Grid* - Following the confirmation of sufficient available land for the development of the solar facility, the Applicant considered the possible grid connection points in order to evacuate the generated electricity into the national grid. This was considered as a vital aspect by the Applicant for the project. Within the surrounding area of Acrux Solar PV Project Two existing and viable grid connection infrastructure is available within 5km from the site. The Applicant specifically considers a connection to the existing 400 kV Harvard Transmission Substation as an opportunity for the development of the solar facility as the lack of viable grid connection points can be quite limiting and challenging for the development of solar energy facilities. The Applicant considered this as a benefit to the project and environment as a whole to reduce the on-ground disturbance by power lines within the area as well as the associated visual intrusion. Two grid connection corridors are under assessment for the placement of the overhead power line to evacuate the generated electricity to the national grid. These routes are explored in section 2.4 below.

- *Geographical and Socio-Economic Considerations* - The greater area surrounding the site contains intense agricultural development except to the east where large scale urban development is present, which is the town of Bloemfontein. The development is located adjacent to the proclaimed Highlands Nature Reserve, but after further investigation, the Visual Impact Assessment (Appendix E2) confirms that the reserve is only being used for cultivation farming with very low to no tourism potential. The Applicant considered the potential opportunity for the Acrux Solar PV Project Two to bring some opportunity to the area, to an extent, considering the development and growth opportunities associated with development and expansion.

- *Availability of existing infrastructure* - The availability of existing infrastructure was also considered by the Applicant as this will enable the solar facility development to make use of infrastructure already available and thereby reduce the disturbance associated with the construction of the associated infrastructure. The existing road network within the surrounding areas and within the site makes access manageable. The Applicant also considered the fact that the directly surrounding area has little infrastructure related to intense residential uses, which may be affected by the development of a solar facility.

- *Topographical Considerations* - From a topographical perspective there are very few physical constraints present on site which would have an effect on the efforts required for the construction and installation of the PV Panels.

- *Consideration of sensitive environmental features through environmental screening* – Following the confirmation of the Acrux Solar PV Project Two preferred site as being technically feasible for the development of a solar facility, the developer set out to screen the site, and assess the main constraints and opportunities and whether or not there were any potential fatal flaws or significant no-go areas that might compromise or limit the development of the solar facility. The screening

exercise included the consideration of desktop information mainly relating to ecological features and sensitive habitats and features associated with wetlands and birds present within the site.

The approach applied by the Applicant in terms of the site selection for Acrux Solar PV Project Two demonstrates due consideration of the sustainability of the site for the development of Acrux Solar PV Project Two, 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.

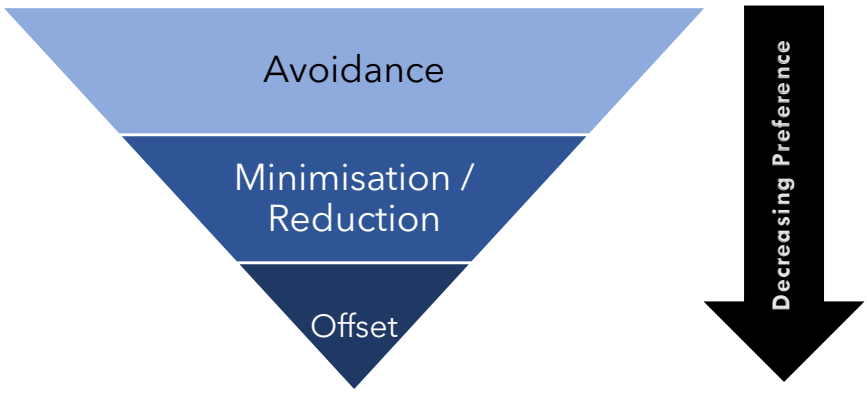

Figure 2.3: Typical mitigation hierarchy

2.4 Alternatives under assessment

This section describes the alternatives under consideration for the Acrux Solar PV Project Two. 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 environment perspective. Refer to Table 2.3 for an overview of the alternatives being considered.

Table 2.3: Summary of the alternatives considered.

Alternatives considered	Description of the Alternative relating to the development
Site specific and Layout Alternatives	One preferred site / development area has been identified for the development of Acrux Solar PV Project Two based on specific site characteristics such as the solar resource, land availability, topographical characteristics and environmental features. The development area of 2000 ha is considered to be sufficient for the development of a solar facility with a contracted capacity of up to 650 MW.
Activity Alternatives	Only the development of a renewable energy facility is considered by Acrux Solar PV Project Two (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 activities).
Technology Alternatives	Only the development of a photovoltaic solar facility is considered due to the characteristics of the site, including the natural resources available.
Grid Connection Alternatives	In order to evacuate the generated electricity, the Applicant has identified two grid connection corridors under assessment for the placement of the overhead power line. Confirmation of the preferred alternative corridor will be based on feedback provided by the Eskom Grid Access Unit, and therefore one grid connection corridor will be approved for the placement of the power line infrastructure.
'Do-nothing Alternative	The option to not construct the Acrux Solar PV Project Two. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within or within the surrounding areas of the site. The opportunities associated with the development of the solar facility for the Bloemfontein area will however not be made available.

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 has been undertaken by the Applicant for the identification of the development area. The development area is large in extent (2000 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.

The process to ultimately identify the preferred development footprint/layout alternative will be as follows:

1. The entire extent of the development area (2000 ha) will be fully assessed as part of the Scoping Phase and within this draft Scoping Report.
2. The Applicant and EAP will then consider all final and confirmed environmental sensitivities for the site and through the use of spatial mapping consider the areas that need to be avoided and are not available for the placement of infrastructure. This will provide guidance to the Applicant for the design and placement of infrastructure as part of the development footprint to be put forward for assessment as part of the EIA Phase.
3. At the commencement of the EIA Phase the Applicant will provide to the EAP a draft facility layout which will be assessed by the EAP in the EIA Report. This layout will then also be provided to the independent specialists for assessment as part of the impact assessment and thereby also provide feedback on the suitability of the draft layout. The layout will also be made available to I&APs as part of the 30-day review and comment period of the draft EIA Report.
4. Should any further concerns be raised by the specialists 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.

Therefore, the current layout provided as part of the Scoping Phase provides an indication of the 2000 ha development area and the preliminary locations of certain associated infrastructure. The layout to be included in the draft EIA Report will be much more detailed and consider the limitations of the site from an environmental perspective. Figure 2.4 provides an indication of the layout currently under assessed as part of the Scoping Phase.

In terms of the location of the BESS within the development footprint, the Applicant has indicated that conventionally 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. Acrux Solar PV Project Two (Pty) Ltd will consider both location alternatives to determine which location alternative is more feasible from an engineering perspective.

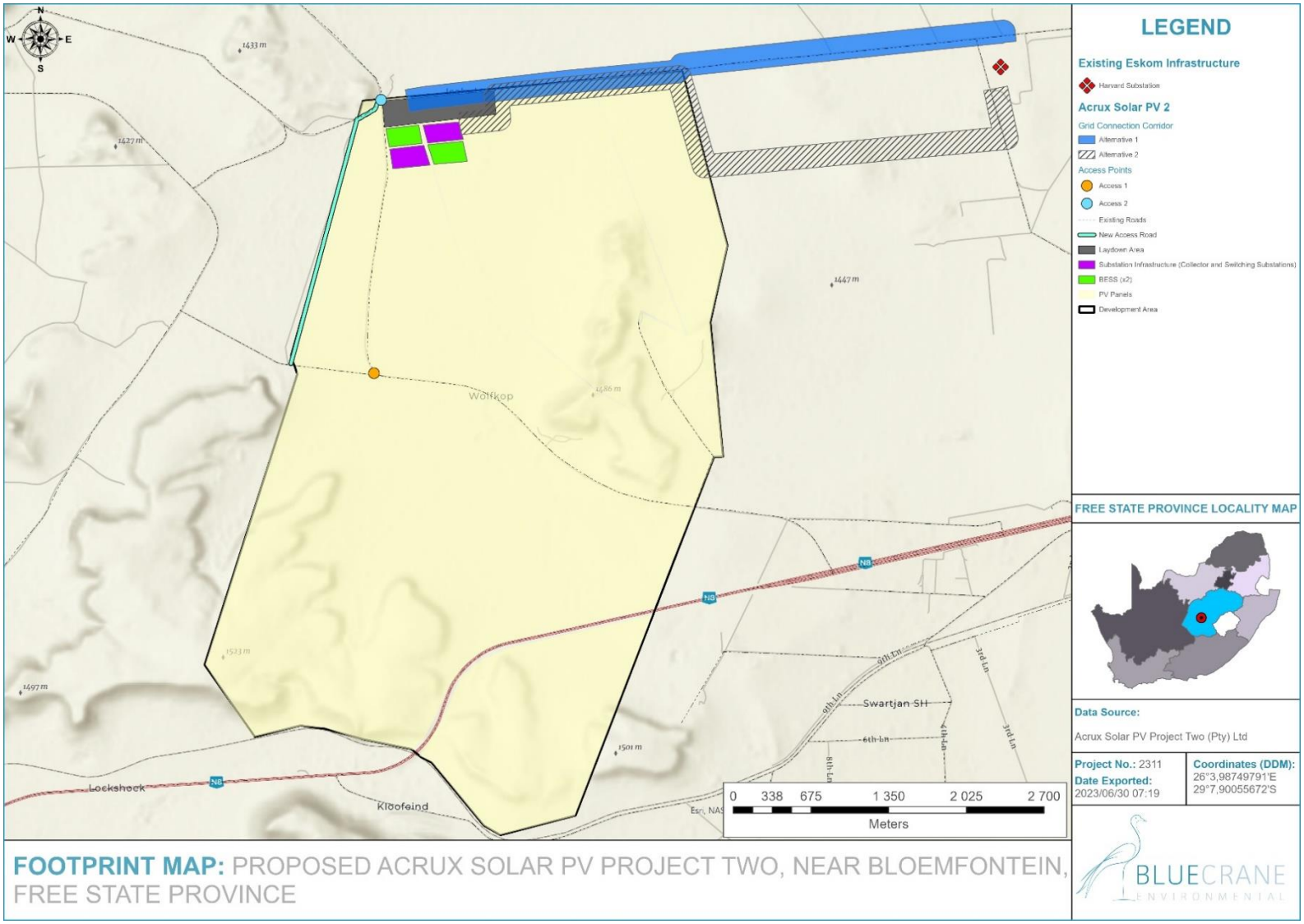

Figure 2.4: Acrux Solar PV Project Two layout under assessment as part of the Scoping Phase

2.4.2 Activity Alternatives

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

When considering Acrux Solar PV Project Two (Pty) Ltd, the company is by trade a renewable energy project development 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 and the fact that there are no constructed solar facilities within the surrounding area, the potential for cumulative impacts associated with the development of solar facilities is considered to be low. This is considered to be a positive aspect with regards to implementing this technology in the identified location (i.e., site). In addition, grid connection infrastructure to connect the solar facility to the national grid is present within the vicinity of the site.

In terms of alternative renewable energy generation options available 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 limitation 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 county. 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 Acrux Solar PV Project Two (Pty) Ltd is an Independent Power Producer, only renewable energy technologies are being considered for the generation of up to 650 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 in the site (i.e. agriculture), 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 Acrux Solar PV Project Two, technology alternatives were considered in terms of the PV panels that may be installed as well as type of Battery Energy Storage System (BESS). 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 Acrux Solar PV Project Two. 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 Acrux Solar PV Project Two 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 is 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)

Two BESS technology alternatives are under consideration for Acrux Solar PV Project Two. 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 a solid-state technology type would be envisaged for implementation.

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.

Acrux Solar PV Project Two (Pty) Ltd will consider both location alternatives to determine which location alternative is more feasible from an engineering perspective.

2.4.4 Grid Connection Alternatives

The Applicant has identified the existing Harvard 400 KV Substation as the preferred connection point to enable the evacuation of the generated electricity into the national grid. The Harvard Substation is located approximately 3 km to the east of the development area.

Two 200 m wide grid connection corridors have been identified by the Applicant for assessment within which the overhead power line will be placed. The entire extent of the grid connection corridors will be assessed and the preferred corridor will be indicated in the EIA phase following the detailed specialist impact assessments. Further to the above confirmation in terms of the preferred alternative will also be based on feedback provided by the Eskom Grid Access Unit, to still be obtained by the Applicant.

The details of the two alternative power line routes are as follows:

- Alternative 1 - A 132 kV single or double circuit overhead powerline (OHPL) is proposed and will transmit energy generated by the solar facility directly into the existing Harvard 400 kV Substation. The proposed OHPL will be approximately 6 km long. This alternative is located to the north of the Koppies Road.

- Alternative 2 - A 132 kV single or double circuit overhead powerline (OHPL) is proposed and will transmit energy generated by the solar facility directly into the existing Harvard 400kV Substation. The proposed OHPL will be approximately 5.8 km long. This alternative is located to the south of the Koppies Road.

Refer to Figure 2.5 below.

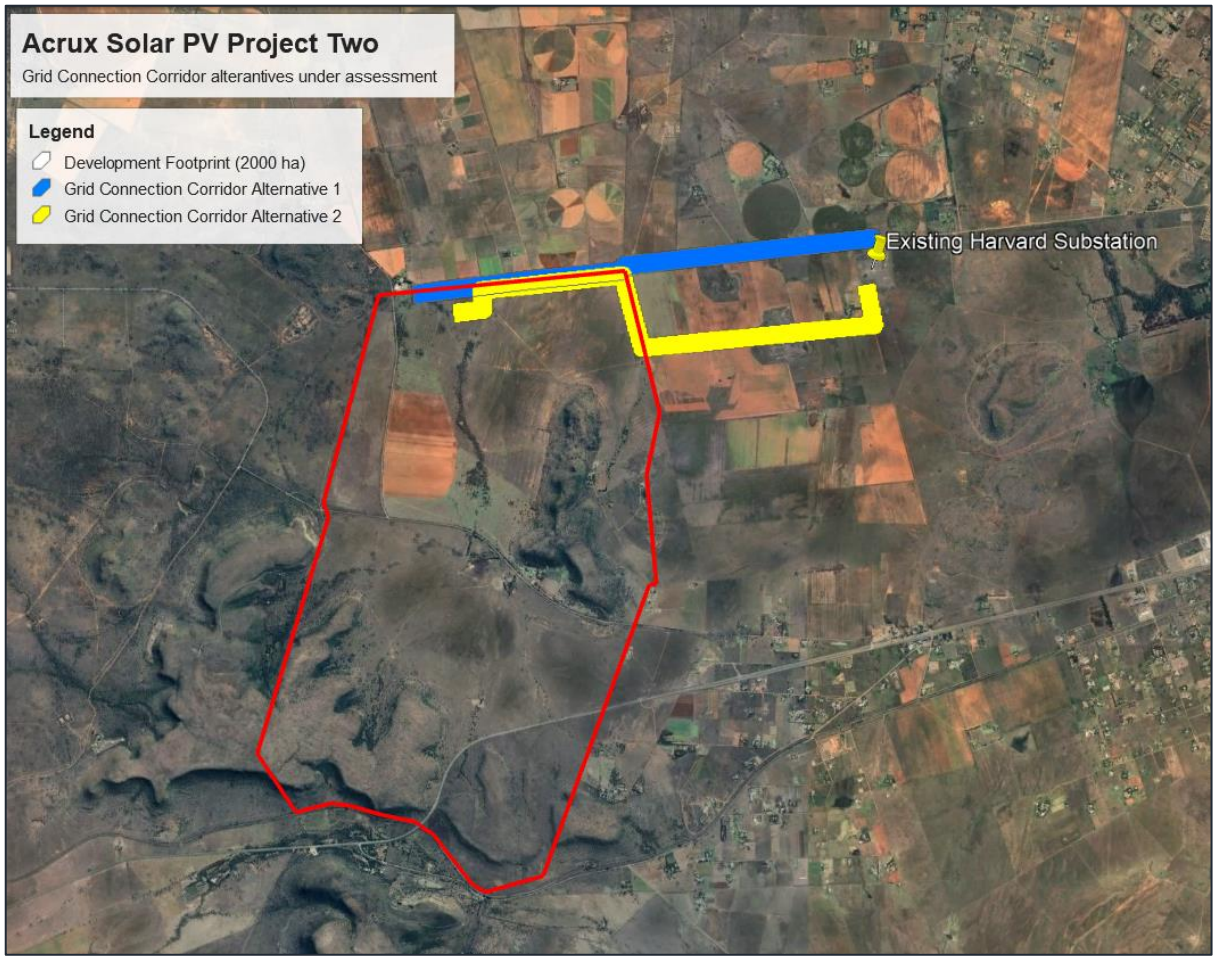

Figure 2.5: Acrux Solar PV Project Two grid connection corridor alternatives under assessment for the placement of the overhead power line

2.4.5 '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 6 of this report could be considered the baseline conditions (*status quo*) to persist should the no-go / 'no nothing' alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged and will continue to be used for the current land uses present. The area associated with the development area has limited agricultural potential (some crop fields present) and with grazing. 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 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 2.4.

Table 2.4: Summary of the activities to be undertaken in the development phases

Design and Pre-Construction Phase	• 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 attempt to 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, substations 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.
Construction Phase	• The majority of the labour force is expected to be sourced from the surrounding towns, 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 400 employment opportunities. These employment opportunities will be temporary, and will last for a period of approximately 18 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.

[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.

	• 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 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. • 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 establishment of the ancillary infrastructure (including the substations) 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, 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.
Operation Phase	• The facility is expected to operate for a minimum of 20 years. • The facility will operate continuously, 7 days a week, during daylight hours. • 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	• The economic viability of the PV facility following the initial 20-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 dissembled and replaced with new, more efficient technology / infrastructure available at the time. This replacement will be within the ambit of the Environmental Authorisation for Acrux Solar PV Project Two. • 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. Three options will be considered, in order of priority by the Developer:

a. Water will be trucked from the nearest municipality water take-off point during construction phase. During the operational phase, supply will be sourced from the Local Municipality (LM). The Developer will approach the Local Municipality to enquire whether they can provide all or part of the total water requirements of the Project. Specific arrangements will be agreed with the Local Municipality in a Service Level Agreement (SLA), following the appointment of preferred bidder during the financial close period.
b. Water will be abstracted from an existing borehole within the affected property, subject to NWA requirements.
c. A new borehole on site, subject to NWA requirements.

The estimated amount of water required during construction is 61 000m^3. The estimated maximum amount of water required during the operational phase is 10 000m^3 per annum.

2. Stormwater Management

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

3. Sanitation

During construction phase, portable chemical toilets will be utilised, that will be serviced privately or by the local municipality. Wastewater will be disposed of at a licensed landfill site.

No effluent will be produced during operation of the facility, except for normal sewage from site and operations staff. Formal sanitation (such as chemical or water borne sanitation facilities) will be provided as far as practically possible.

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 has requested confirmation from the municipality regarding the availability of sufficient capacity at their registered landfills for the solid waste. The confirmation will be made available once received by the Applicant from the municipality.

During the operational 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 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 2: Content of the scoping report:

Requirement	Relevant Section
2(b) the location of the activity, 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.	The details of the location of the Acrux Solar PV Project Two is included in section 2.1. This includes the relevant Survey General Codes of the affected properties.
2(c) a plan which located the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	The draft layout plan considered as part of the Scoping Phase is discussed and included in section 2.4.1. The formal map is also included as Figure J.
2(d) a description of the scope of the proposed activity, including (ii) a description of the activities to be undertaken, including associated structures and infrastructure.	The details of the infrastructure proposed to be developed is fully described in section 2.2. A description of the activities to be undertaken for the various development phases is included in section 2.5.
2(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including (i) details of all the alternatives considered, (ix) the outcome of the site selection	The site selection process followed by the Applicant is described in section 2.3. The details of all alternatives considered as part of this draft

matrix; (x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and (xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity	Scoping Report is included and described in section 2.4.

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 Acrux Solar PV Project Two 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 Acrux Solar PV Project Two.

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:

- Free State Provincial Spatial Development Framework (PSDF) (2012)

Local Level:

- Manguang Metropolitan Municipality Draft Integrated Development Plan 2022/2027 (April 2022).
- Manguang Metropolitan Municipality District / Metro One Plan (October 2022).

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 achieving 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 financials capacity to respond to loss and damage associated with catastrophic effects of climate change.
2. *Maintaining a clear intention to keep 1.5^{0}C within reach* – The UN's Intergovernmental Panel on Climate Change indicates that limiting warming to around 1.5^{0}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^{0}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 III (June, 2013)

The Equator Principles (EPs) III constitute a financial industry benchmark used for determining, assessing, and managing projects environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are applicable to large infrastructure projects 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, Acrux Solar PV Project Two 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 of 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 proposed project. In terms of the EPs South Africa is a non-designated country, and as such the assessment process for projects located in South Africa evaluates compliance with the applicable International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines.

Acrux Solar PV Project Two is under assessed 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 Acrux Solar PV Project Two 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 Acrux Solar PV Project Two

Legislation and Relevant Authority	Summary and Relevance for the Development
The Constitution of South Africa (Act No. 108 of 1996) **Administering Authority:** **National Government**	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 government to give effect to the people's environmental right and places government under a legal duty to act as a responsible custodian of the country's environment. It compels government to pass legislation and use other measures to protect the environment, to prevent pollution and ecological degradation, promote conservation and secure sustainable development. The development of Acrux Solar PV Project Two and the aspects related thereto considers the creation of an environment which is not harmful or degraded through the implementation of appropriate mitigation measures.
The National Environmental Management Act (Act No. 107 of 1998) **Administering Authority:** **National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment) and the Free State Province Department of Economic, Small Business**	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; polluter pays; subsidiary; waste avoidance and minimisation; co-operative governance; sustainable development; and environmental protection and justice. 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. The S&EIA process undertaken for Acrux Solar PV Project Two is in-line with the requirements of NEMA for the Application for Environmental Authorisation.

Development, Tourism and Environmental Affairs (DESTEA)	
The National Energy Act (Act No. 34 of 2008) **Administering Authority:** **Department of Mineral Resources and Energy**	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). Considering that Acrux Solar PV Project Two is proposed to make use of PV technology and the solar resource for the generation of electricity, the proposed projects are in-line with the Act.
Electricity Regulation Act (Act No. 4 of 2006) (as amended) **Administering Authority:** **National Energy Regulator of South Africa (NERSA)**	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. 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.
The National Water Act (Act No. 36 of 1998) **Administering Authority:** **Department of Water Affairs (now known as Department of Water and Sanitation)**	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 the 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. As this Act is founded on the principle that National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public 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.

	The PAOI overlaps with a single depression (DEPR) wetland listed as Least Threatened (LT). Furthermore, the PAOI overlaps with unclassified FEPA wetlands, while several FEPA wetlands types are located within the PAOI. Also, should a water use license be required for the project, the National Water Act will be applicable in terms of obtaining the relevant license.
National Environmental Management: Biodiversity Act (10 of 2004) (NEMBA) **Administering Authority:** **Department of Forestry, Fisheries and the Environment (DFFE)**	"The Act calls for the management of all biodiversity within South Africa. The 2007 Threatened or Protected Species Regulations (GN R150, 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." The Act also provides for duty of care with regards to control of alien species.
National Environmental Management: Waste Act (Act No. 59 of 2008) **Administering Authority:** **Department of Forestry, Fisheries and the Environment (DFFE)**	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. 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.
National Environment Management: Air Quality Act (Act No. 39 of 2004) **Administering Authority:**	The object 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. 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

Department of Forestry, Fisheries and the Environment (DFFE)	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.
The National Heritage Resources Act (Act No. 25 of 1999) **Administering Authority:** **South African Heritage Resources Agency (SAHRA)**	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. 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. A case file with reference number 21203 has been opened on SAHRIS for the Acrux Solar PV Project Two and all relevant documents were submitted for their comments and approval. The Heritage Impact Assessment undertaken for the solar PV facility is included as Appendix E4, and the Palaeontological Impact Assessment is included as Appendix E5.
Conservation of Agricultural Resources Act (Act No. 85 of 1983) **Administering Authority:** **National and Provincial Government**	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. 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 scoping statement have been provided for the Acrux Solar PV Project Two and included as Appendix E1.

Subdivision of Agricultural Land Act (70 of 1970) (SALA) **Administering Authority:** **Department of Agriculture, Land Reform and Rural Development (DALRRD)**	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 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.
Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013) (SPLUMA) **Administering Authority:** **Provincial Authority**	This suite of legislation provides the framework for spatial planning and regulates the use and development of land.
The National Forests Act, 1998 (Act 84 of 1998) **Administering Authority:** **Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)**	The purposes of this Act are to: (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.

	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 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. An ecological scoping statement has been undertaken for the Acrux Solar PV Project Two and is included in Appendix E1.
National Road Traffic Act (93 of 1996) (NRTA) **Administering Authority:** **Department of Roads and Public Works**	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 component, they will need to be transported via "abnormal loads". The site is directly adjacent to the N8 therefore providing easy access from national roads. Some roads have been identified for upgrade to ensure that the heavy vehicles can reach the site.

Table 3.2: Policy context relevant to Acrux Solar PV Project Two

Policy and Relevant Authority	Summary and Relevance for the Development
The White Paper on the Energy Policy of the Republic of South Africa (1998) **Administering Authority:** **Department of Mineral Resources and Energy**	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: • 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

	The White Paper sets out the advantages of renewable energy and states that 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. The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include: • Minimal environmental impacts in operation in comparison with traditional supply technologies; and • Generally lower running costs, and high labour intensities. Disadvantages include: • 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. Acrux Solar PV Project Two is in line with this policy as it proposes the generation of renewable energy from the solar resource.
The White Paper on Renewable Energy (2003) **Administering Authority:** **Department of Mineral Resources and Energy**	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 Government's vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa. 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: *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). The Acrux Solar PV Project Two is in line with this paper as it proposes the generation of renewable energy from the solar resource.
Integrated Resource Plan (IRP) for South Africa (2010-2030) **Administering Authority:** **Department of Mineral Resources and Energy**	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. "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 Acrux Solar PV Project Two. In 2010 several changes were made to the IRP model. The main 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) have 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). 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). The Acrux Solar PV Project Two 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.
National Development Plan of 2030 **Administering Authority:** **The Presidency: National Planning Commission**	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 unsustainably resource intensive and the acceleration and expansion of renewable energy was identified as a key intervention strategy to address this challenge. Acrux Solar PV Project Two will contribute to the intervention strategy as identified within the plan.
National Infrastructure Plan of South Africa (2012) **Administering Authority:** **Presidential Infrastructure Coordinating Commission**	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 eighteen (18) strategic integrated projects (further referred to as SIPs). These SIPs stretch over all nine (9) provinces, covering social and economic infrastructure, and projects that enhances 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: • 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.

	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 bio-fuel 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 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). The Acrux Solar PV Project Two 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.
New Growth Path Framework **Administering Authority:** **Department of Economic Development**	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). This framework sets out the markers for job creation and growth and identify 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: • 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). 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 technologies like solar (RSA, 2011b). In this regard it will also assist creating employment opportunities over the medium- and long-term. Considering that the construction of and investment in renewable energy is a key area identified within the framework, the Acrux Solar PV Project Two is considered to be in-line with the framework.

Climate Change Bill (2018) **Administering Authority:** **National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)**	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: • 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. The Acrux Solar PV Project Two comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.
Climate Change Bill (2021) **Administering Authority:** **National Department of Forestry, Fisheries and the Environment**	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 gasses and that the anticipated impacts arising as a result of climate change have the potential to undermine achieving of the country's developmental goals. 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. The Acrux Solar PV Project Two comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation.

Strategic Integrated Projects (SIPs) (2010 – 2030) **Administering Authority:** **The Presidential Infrastructure Coordinating Committee**	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: • 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 bio-fuel production facilities. • SIP 9: Electricity generation to support socio-economic development: The proposed Acrux Solar PV Project One 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 2010 to meet the needs of the economy and address historical imbalances. The Acrux Solar PV Project Two could be registered as a SIP project once selected as a preferred bidder under the REIPPP Programme. The project would then contribute to the above-mentioned SIPs.
Strategic Environmental Assessment (SEA) for wind and solar PV Energy in South Africa (2014) **Administering Authority:** **National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)**	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. 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 socio-economic benefits to the country. These areas are referred to as Renewable Energy Development Zones (REDZs). 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 the likely to be the most important factor 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. The Acrux Solar PV Project Two is not located within a REDZ, but the development will contribute to the expansion of renewable energy facilities and infrastructure within the country, and provide the positive opportunities associated with it.
Free State Provincial Spatial Development Framework (PSDF) (2012) **Administering Authority:** **Free State Provincial Department**	The Free State PSDF is a policy document that promotes a 'developmental state' in accordance with national and provincial legislation and directives. It aligns with the Free State Provincial Growth and Development Strategy which has committed the Free State to 'building a prosperous, sustainable and growing provincial economy which reduces poverty and improves social development'. The PSDF includes comprehensive plans and strategies that collectively indicate which type of land-use should be promoted in the Province, where such land-use should take place, and how it should be implemented and managed. In broad terms, the PSDF: • Indicates the spatial implications of the core development objectives of the Free State Provincial Growth and Development Strategy. • Serves as a spatial plan that facilitates local economic development. • Lays down strategies, proposals and guidelines as it relates to sustainable development. • Facilitates cross-boundary co-operation between municipalities, adjoining provinces, and bordering countries. • Serves as a manual for integration and standardisation of the planning frameworks of all spheres of government in the Province. The Free State Provincial Growth and Development Strategy states that sustainable economic development is the only effective means by which the most significant challenge of the Free State, namely poverty, can be addressed is. The PSDF gives practical effect to sustainable development, which is defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The PSDF is prepared in accordance with bioregional planning principles that were adapted to suit the site-specific requirements of the Free State. It incorporates and complies with the relevant protocols, conventions, agreements, legislation and policy at all applicable levels of planning, ranging from the international to the local.

	The PSDF builds upon achievements and learns from mistakes of the past, reacts to the challenges of our time, incorporates the traditional knowledge of the people of the Free State, and builds upon international best-practice and technology. The development of Acrux Solar PV Project Two is in-line with the framework based on the contributions and opportunities presented by development of this nature.
Mangaung Metropolitan Municipality Draft Integrated Development Plan (IDP) 2022/2027 (2022) **Administering Authority:** **Mangaung Metropolitan Municipality**	The Mangaung Metropolitan Municipality identified five strategic development objectives for the municipal area as part of the 2022/2027 Draft Integrated Development Plan (IDP). The objectives include spatial transformation, economic growth, service delivery improvement, financial health improvement and organisational strength. With these objectives the Municipality also identifies strategic risks to enable early warning in terms of the city's planning, implementation and monitoring to achieve the objectives. These risks include, but are not limited to climate change, pollution, drought, flooding, loss of natural resources, high unemployment rates, financial instability, financial viability, technological failure and skills shortage. Further to the above, the Municipality has considered and identified specific outcome indicators in terms of energy and electricity within the municipal area. One outcome identified by the IDP is improved energy sustainability, with the outcome indicator referring to renewable energy capacity available within the municipal jurisdiction as a percentage of Eskom supply capacity to the municipality. With the output indicators referring to the total renewable energy capacity available through IPPs and a percentage of municipal buildings utilising electricity from renewable electricity. The IDP of the municipal area within which Acrux Solar PV Project Two is located therefore supports the development of renewable energy generation and seeks to promote such developments as part of improved energy sustainability.
Mangaung Metropolitan Municipality District / Metro One Plan (2022) **Administering Authority:** **Mangaung Metropolitan Municipality**	Six transformational goals are outline in the plan which includes spatial restructuring and environmental sustainability. In terms of environmental sustainability, the strategic outcome is to facilitate the protection and sustainable management of the natural environmental resources, with the strategic action being to contain urban development and manage rural areas through appropriate application of Spatial Planning Categories. Furthermore, the plan indicates the need to implement climate change adaptation and mitigation measures, which considered the energy sector. The mitigation measures /intervention projects proposed includes the development of renewable energy, as well as the implementation of measures for energy efficiency. The details of the interventions include the building of solar parks that will feed electricity to the National Grid, use of Solar in residential areas and industry and the installation of solar water heaters.

	The plan for the municipal area therefore identifies the need for renewable energy developments, specifically that of solar energy facilities, such as Acrux Solar PV Project Two.
Mangaung Metropolitan Municipality Spatial Development Framework (SDF) (2020) **Administering Authority:** **Mangaung Metropolitan Municipality**	In order to guide the Mangaung MM's Vision and Mission statements, several objectives were identified. The following objectives will ensure that the municipality succeeds in their main purpose: • Objective 1: provide a strategic spatial development vision for the metropolitan area in line with the broad development objectives of the National and Provincial policies. • Objective 2: provide a clear and comprehensive Spatial Framework for the metropolitan area which will inform, improve and guide cross-sectoral policy alignment and project implementation. • Objective 3: indicate in as much detail as possible to stakeholders the desired future spatial form for the metropolitan area. • Objective 4: highlight planning, environmental, infrastructure and institutional issues that gave rise to the proposal. • Objective 5: provide all stakeholders an opportunity to participate during the process of formulating the SPF. • Objective 6: provide spatial reflection of the needs and priorities established in the Mangaung IDP and identify specific issues which are unique to the metropolitan area. • Objective 7: address rural development issues such as the integration with urban area, the provision of social facilities and the provision of infrastructure to rural communities. • Objective 8: Identify areas for economic opportunities, particularly in the industrial, commercial, agricultural and tourism sectors. • Objective 9: Identify infrastructure needs and services constraints and bring forward tangible solutions. • Objective 10: Accommodate the growing housing needs taking into account the current backlogs and the projected need for development of various housing methodologies. • Objective 11: protect the natural environment, and more specifically hydrological and topographical resources, biodiversity areas, and high potential agricultural land. The development of the Acrux Solar PV Project Two 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 2: Content of the scoping report:

Requirement	Relevant Section
2(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	The entire section 3 provides a description of the policy and legislative context relevant to the proposed Acrux Solar PV Project Two.

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.

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 Acrux Solar PV Project Two "fits" into and contribute to the electricity generation of the country and the contributions made to the fight against climate change.

Over 90% of South Africa's electricity generation is coal based, the World bank estimates that this results in an annual, per capita carbon emission of ~8.9 tons per person. Based on 2008 fossil-fuel CO_2 emissions statistics released by the Carbon Dioxide Information Analysis Centre, South Africa is the 13th largest carbon dioxide emitting country in the world and the largest emitter in Africa (Boden, et al. 2011). In August 2021 an article confirmed that South Africa is the 12th highest greenhouse gas emitter in the world (source: https://www.news24.com/fin24/economy/eskom-will-only-able-to-meet-global-air-quality-standards-by-2050-owing-to-financial-woes-20210818).

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. According to the 2021 State of the Nation Address, Government will soon 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 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, the largest greenhouse gas emitter of South Africa, 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.

Besides capacity additions, several assumptions have changed since the promulgation of IRP 2010–2030. Key assumptions that changed include the electricity demand projection, Eskom's existing plant performance, as well as new technology costs. These changes necessitated the review and update of the

IRP which resulted in the draft IRP 2018 that was made available for comment and updated to the draft IRP 2019 as per Table 4.1.

Table 4.1: Published Draft IRP 2019

	Coal	Coal (Decommissioning)	Nuclear	Hydro	Storage	PV	Wind	CSP	Gas & Diesel	Other (Distributed Generation, CoGen, Biomass, Landfill)
Current Base	37149		1860	2100	2912	1474	1980	300	3830	499
2019	2155	-2378					244	300		Allocation to the extent of the short term capacity and energy gap.
2020	1433	-557				114	300			
2021	1433	-1403				300	818			
2022	711	-844			513	400 1000	1600			
2023	750	-555				1000	1600			500
2024			1860				1600		1000	500
2025						1000	1600			500
2026		-1219					1600			500
2027	750	-847					1600		2000	500
2028		-475				1000	1600			500
2029		-1684			1575	1000	1600			500
2030		-1050		2500		1000	1600			500
TOTAL INSTALLED CAPACITY by 2030 (MW)	33364		1860	4600	5000	8288	17742	600	6380	
% Total Installed Capacity (% of MW)	43		2.36	5.84	6.35	10.52	22.53	0.76	8.1	
% Annual Energy Contribution (% of MWh)	58.8		4.5	8.4	1.2*	6.3	17.8	0.6	1.3	

Installed Capacity
Committed / Already Contracted Capacity
Capacity Decommissioned
New Additional Capacity
Extension of Koeberg Plant Design Life
Includes Distributed Generation Capacity for own use

According to the South African Energy Sector Overview (2021), there is currently 1 723 MW of installed PV capacity, while an additional 2 600 MW and 860 MW from wind and solar has been rewarded as part of Bid window 5 and 6, respectively (latter announced in 2022).

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 Desirability of the Development

The receptiveness of the site /development area for the construction and operation of Acrux Solar PV Project Two 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.

The feasibility of the site for the development provides an indication of the desirability of the development within the site. The Acrux Solar PV Project Two is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties currently used for agricultural

practises. The affected farm portions have 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.

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

- Increased energy security - 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.

- Utilisation of significant renewable energy resource - 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 Acrux Solar PV Project Two 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 Acrux Solar PV Project Two, and the associated electricity generated as a result of the facility, will result in considerable savings on tons of CO_2 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 1000 employment opportunities will be created during the construction phase and up to 25 permanent employment opportunities during the operational phase.

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 2: Content of the scoping report:

Requirement	Relevant Section
2(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	The need and desirability of the development of Acrux Solar PV Project Two has been fully considered within section 4.

5 APPROACH TO THE PROCESS

The development of Acrux Solar PV Project Two requires Environmental Authorisation in accordance with the requirements of Section 24 of NEMA and the 2014 EIA Regulations (GNR 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.

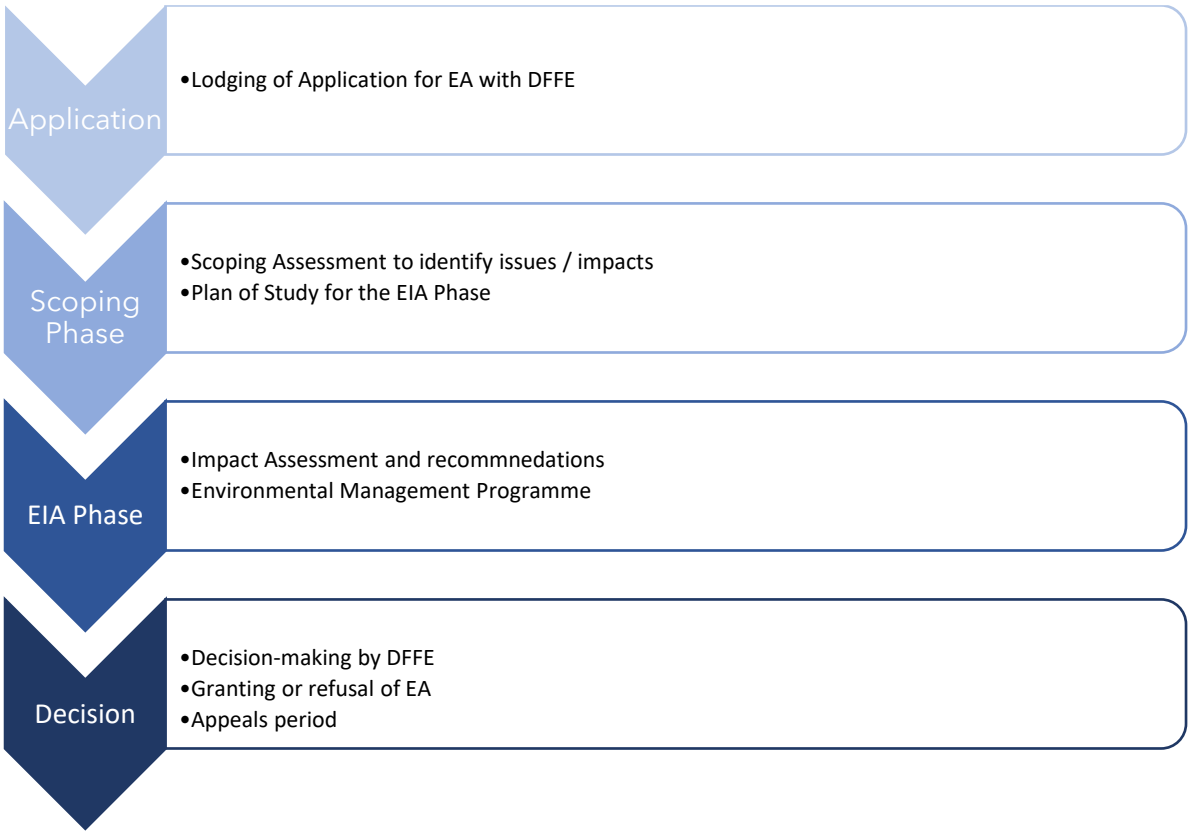

Figure 5.1: The phases of an EIA Process

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 Acrux Solar PV Project Two 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 GNR 779 of 01 July 2016. The Provincial Free State

Department of Economic, Small Business Development, Tourism and Environmental Affairs is the Commenting Authority on the project.

In terms of the EIA Regulations, 2014 (as amended) the S&EIA process is subject to pre-scribed timeframes that must be adhered to. These prescribed timeframes must be adhered to otherwise the Application for Environmental Authorisation will lapse and the process needs 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.

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

The final Scoping Report and Plan of Study for the EIA must be 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. 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 Assessment of Potential Impacts and Issues

As part of the Scoping Phase independent specialists have been appointed to scope out and identify potential environmental impacts and issues that will need to be assessed in detail as part of the EIA Phase of the process. The independent specialists also provide an assessment of the potential impacts and provide preliminary recommendations for the mitigation and management of the identified impacts. The impacts will be assessed in more detail during the EIA Phase of the S&EIA process and the recommendations and mitigation measures will be refined accordingly.

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 Acrux Solar PV Project Two is applicable as it triggers Regulation 21 of the EIA Regulations, 2014 (as amended).

Table 5.1, 5.2 and 5.3 included below provides an indication of the specialist studies identified by the DFFE Screening Tool Report (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.

Table 5.1: Specialist studies Identified by the DFFE screening tool, solar PV category and specialist studies completed.

Theme	Sensitivity Rating	Specialist Study Undertaken (yes/no)	Comment/Motivation
Agriculture	Very High	Yes	A rapid Soils assessment has been included in the combined specialist scoping report as Appendix E1.
Animal Species	High	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Aquatic Biodiversity	Low	Yes	A rapid Wetland assessment has been included in the combined specialist scoping report as Appendix E1.
Archaeological and Cultural Heritage	Low	Yes	Heritage Impact Assessment included as Appendix E4.
Avian	Low	Yes	A rapid Avifauna assessment has been included in the combined specialist scoping report as Appendix E1.
Civil Aviation (Solar PV)	Low	No	No major or other types of civil aviation aerodromes have been identified in close proximity of the development area. Therefore, the

			EAP agrees with the findings of the STR. The Civil Aviation Authority (CAA) has been identified as an I&AP and will be kept informed of the project as the process advances. No comment has been received from the CAA to date.
Defence	Medium	No	The defence theme is rated medium sensitivity. The STR alludes to a defence site in close proximity to the development area, however, a distance has not been specified. The impacts stemming from the proposed development is not expected to result to any impact on potential defence sites nearby. The South African National Defence Force (SANDF) has been identified as an I&AP and will be kept informed of the project as the process advances. No comment has been received from SANDF to date.
Landscape (Visual)	Very High	Yes	A Visual Impact Assessment is included as Appendix E2.
Palaeontology	Very High	Yes	A Palaeontological Impact Assessment is included as Appendix E5.
Plant Species	Medium	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
RFI	Very High	No	The STR identified a Weather Radar Installation less than 18 km from the development area. The desktop study is inconclusive as no further information related to the weather radar installation could be sourced. The impacts stemming from the proposed development is not expected to result to any impact on potential defence sites nearby. However, the South African Radio Astronomy Observatory (SARAO) has been identified as an I&AP and will be kept informed of the project as the process advances. No comment has been received from SARAO to date.

Terrestrial Biodiversity	Very High	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Social	Unspecified	Yes	A social impact assessment has been undertaken for the proposed development. Refer to Appendix E3.
Geotechnical	Unspecified	No	The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern. The detailed Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout.

Table 5.2: Specialist studies identified by the DFFE screening tool, substation category and specialist studies completed.

Theme	Sensitivity Rating	Specialist Study Undertaken (yes/no)	Comment/Motivation
Agriculture	Very High	Yes	A rapid Soils assessment has been included in the combined specialist scoping report as Appendix E1.
Animal Species	High	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Aquatic Biodiversity	Low	Yes	A rapid Wetland assessment has been included in the combined specialist scoping report as Appendix E1.
Archaeological and Cultural Heritage	Low	Yes	Heritage Impact Assessment included as Appendix E4.
Civil Aviation	High	No	Although the STR refers to dangerous and restricted airspace being demarcated, no major or other types of civil aviation aerodromes have been identified in close proximity of the development area. The Civil Aviation Authority (CAA) has been identified as an I&AP and will be kept informed of the project as the process

			advances. No comment has been received from the CAA to date.
Defence	Very High	No	The defence theme is rated very high sensitivity. The STR alludes to a military and defence site in close proximity to the development area, however, a distance has not been specified. The impacts stemming from the proposed development is not expected to result to any impact on potential military or defence sites nearby. The South African National Defence Force (SANDF) has been identified as an I&AP and will be kept informed of project as the process advances. No comment has been received from SANDF to date.
Palaeontology	Very High	Yes	A Palaeontological Impact Assessment is included as Appendix E5.
Plant Species	Medium	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Terrestrial Biodiversity	Very High	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.

Table 5.3: Specialist studies identified by the DFFE screening tool, power line category and specialist studies completed.

Theme	Sensitivity Rating	Specialist Study Undertaken (yes/no)	Comment/Motivation
Agriculture	High	Yes	A rapid Soils assessment has been included in the combined specialist scoping report as Appendix E1.
Animal Species	Medium	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Aquatic Biodiversity	Very High	Yes	A rapid Wetland assessment has been included in the combined

			specialist scoping report as Appendix E1.
Archaeological and Cultural Heritage	Low	Yes	Heritage Impact Assessment included as Appendix E4.
Civil Aviation	Medium	No	Although the STR refers to other civil aviation aerodromes between 8 and 15 km and civil aviation radar between 15 and 35 km, it is not anticipated that the project will impact negatively on civil aviation aerodromes and radar. The Civil Aviation Authority (CAA) has been identified as an I&AP and will be kept informed of the project as the process advances. No comment has been received from the CAA to date.
Defence	Medium	No	The defence theme is rated medium sensitivity. The STR alludes to a military and defence site in close proximity to the development area, however, a distance has not been specified. The impacts stemming from the proposed development is not expected to result to any impact on potential military or defence sites nearby. The South African National Defence Force (SANDF) has been identified as an I&AP and will be kept informed of project as the process advances. No comment has been received from SANDF to date.
Palaeontology	Very High	Yes	A Palaeontological Impact Assessment is included as Appendix E5.
Plant Species	Medium	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.
Terrestrial Biodiversity	Very High	Yes	A rapid Terrestrial Ecology assessment has been included in the combined specialist scoping report as Appendix E1.

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

5.2 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 5.4 provides the impact rating system applied in this draft Scoping Report.

Table 5.4: 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		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
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.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
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.
CUMULATIVE EFFECT		
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.		
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

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.

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.

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 potential impacts that may be associated with Acrux Solar PV Project Two has been identified and is listed in Section 8 of this draft Scoping Report. An impact assessment is provided of the potential impacts.

5.3 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 2: Content of the scoping report:

Requirement	Relevant Section
2(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint, including (vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	Section 5 of this draft Scoping 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.

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 (GNR 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.

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 Bloemfontein area has also contributed towards the identification of the potential I&APs for Acrux Solar PV Project Two.

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 C3 for the list of registered I&APs.

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. This was achieved through:

- 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 has been 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 C1. The site notices were placed on 23 February 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 Bloemnuus Newspaper on 20 April 2023. The tear sheet of the newspaper advert is contained in Appendix C1.
- 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's 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 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 **04 July 2023 to 03 August 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. I&AP's and organs of state were requested to provide their comments on the report in writing by 03 August 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 Scoping Report for decision-making.

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

40.(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.

40.(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.

40.(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;

40.(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

40.(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.

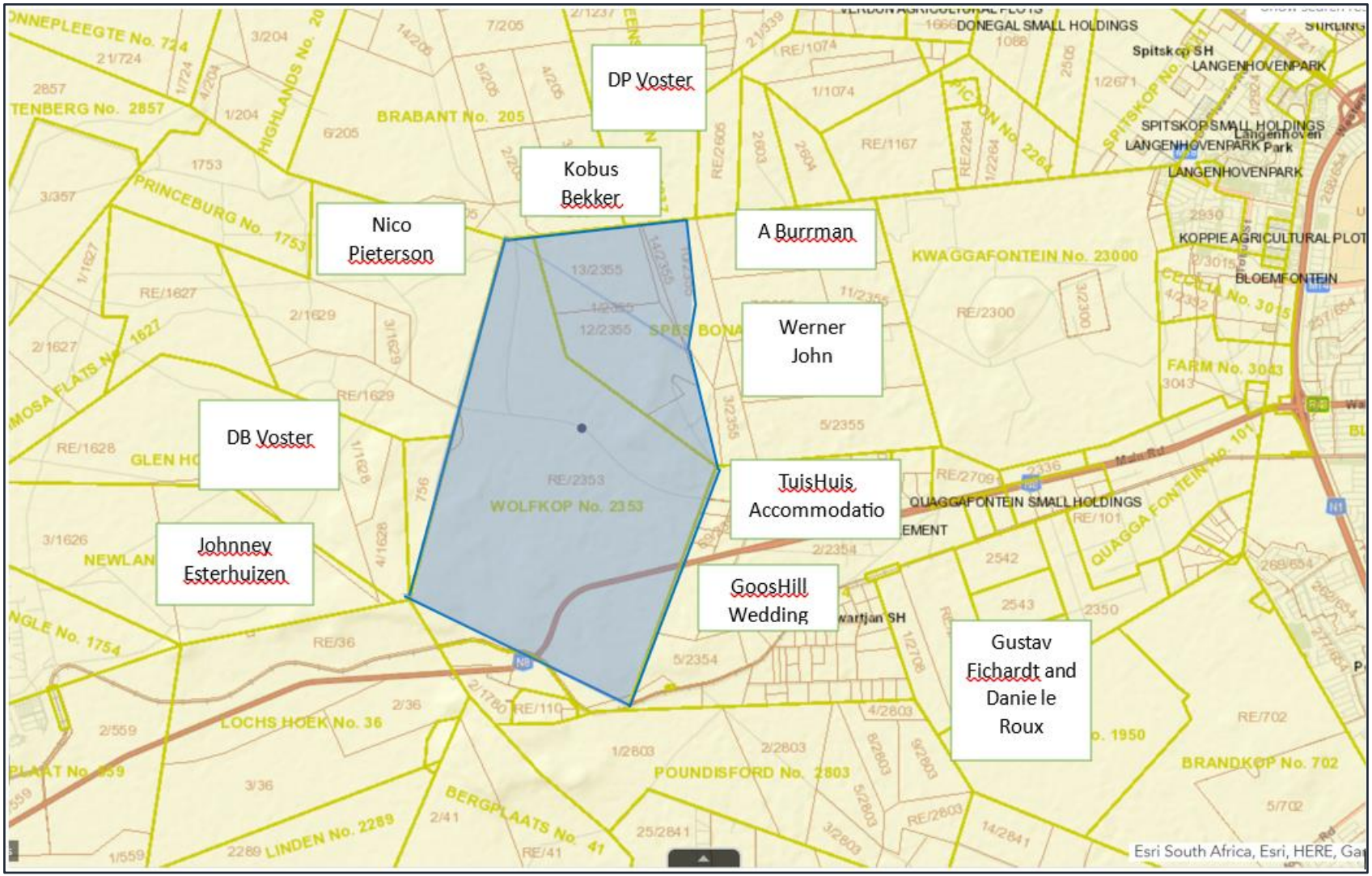

Figure 6.1: Affected properties (indicated in blue) in relation to the identified surrounding landowners.

6.3 Registered I&APs entitled to comment on the Reports and Plans

All registered I&APs on the database (Appendix C3) has been notified, as appropriate, of the availability of the draft Scoping Report for a 30-day review and comment period. The I&APs have been invited to comment on the draft Scoping Report within the stipulated 30-day timeframe (from **04 July 2023 to 03 August 2023**). The notification has been distributed to the I&APs on 03 August 2023.

Proof of notification and correspondence is included in Appendix C4.

All written comments received following notification of the S&EIA process and prior to the release of the draft Scoping Report for review and comment have been included in the comments and responses report as part of this draft Scoping Report as Appendix C6.

All written comments received during the 30-day review and comment period will be recorded, included and addressed in a comments and responses report to be submitted to the DFFE with the final Scoping Report.

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 Scoping 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 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 2: Content of the scoping report:

Requirement	Relevant Section
2(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint, including (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of supporting documents and inputs	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 Scoping Report.
2(g)(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	A summary of the issues raised by I&APs during the 30-day review and comment period of this draft Scoping Report will be included in the final Scoping Report to be submitted to the DFFE for decision-making.

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 footprint 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 above for a list of specialists that were consulted for the proposed Acrux Solar PV Project Two.

7.1 Description of the Study Area

As presented in the Social Impact Assessment (Appendix E3), the proposed Acrux Solar PV Project Two is located within the Free State province.

Free State Province

The Free State Province is located in the central part of South Africa and bordered by six of the nine provinces, with Gauteng, Mpumalanga and North West bordering to the north, Northern Cape to the east, KwaZulu-Natal to the east, and Eastern Cape to the south. The remaining border section of the province is shared with the independent state of Lesotho, providing an important transportation route for Lesotho.

The Free State Province is the third largest province in South Africa covering an area of 129 825km2, while only accommodating the second lowest population and density, with 2 834 714 people at a population density of only 5.1%. The judicial capital of the country Bloemfontein is situated in the heart of the province, with other major towns including Welkom, Kroonstad, Sasolburg and Bethlehem.

Topographically the province is situated on a plateau rising to elevation of 1 800 m above mean sea level in the east, sloping down to west to the Orange River around 1 200 m above mean sea level. The Orange River and Vaal River form the majority of the boundaries of the province, with the first delineating from the southern and second the northern boundary.

Agriculture, mining and manufacturing dominate the economic sector within the province, with 90% of the geographical area used for agricultural activities. Approximately 34% of maize, 37% of wheat, 33% of potatoes, 53% of sorghum, 30% of groundnuts, 18% of red meat and 15% of wool of South Africa's produce is produced in the province. Mining is another major economic driver with the province, specifically with the province identified as

One of South Africa's UNESCOs World Heritage sites is situated within the province, known as the Vredefort Dome which is the largest verified impact structure on Earth. The Maluti Mountains and Golden Gate Highlands National Park are other distinct geographical and tourism features within the province.

The Free State Province is divided into the Mangaung Metropolitan Municipality and four district municipalities, which are further subdivided into 18 local municipalities. Refer to Figure 7.1.

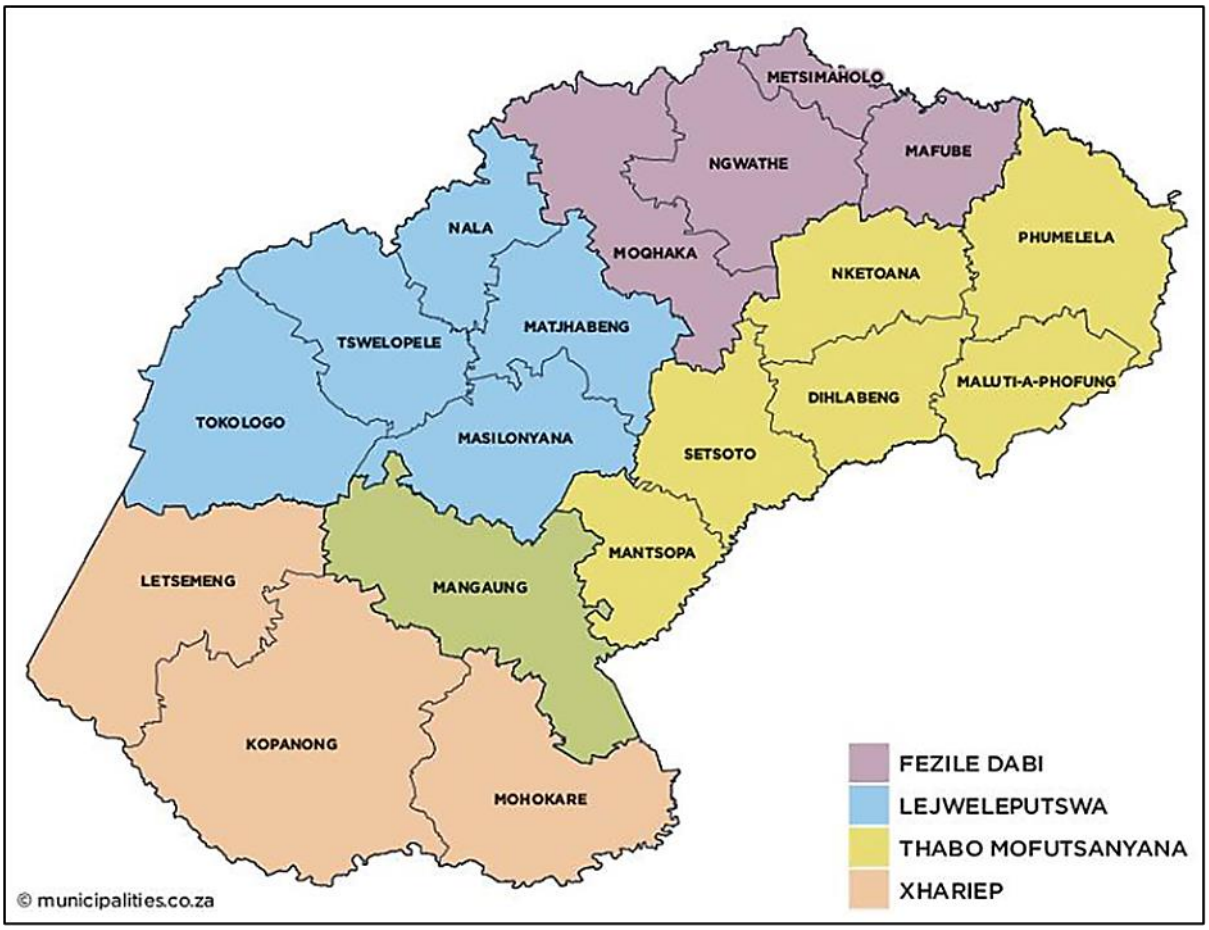

Figure 7.1: District Municipalities of the Free State Province.

Mangaung Metropolitan Municipality

Mangaung Metropolitan Municipality (MM) is a Category A municipality located in the southern centralised part of the Free State Province, one of eight metros in South Africa. Its western and southern border is shared by the Xhariep District Municipality (DM), while the Lejweleputswa DM borders the regions northern boundary. The north-eastern boundary is sharded with the Thabo Mofutsanyana DM of the Free State Province, with the remaining boundary in the east shared with the independent state of Lesotho. Three urban centres are situated in the region, Bloemfontein, Botshabelo and Thaba Nchu.

The Mangaung MM is the smallest administrative region compared to the four other district municipalities of the Free State Province, compromising only 7.6% of the geographical area of the province. Mangaung MM boundaries changed on the 3rd of August 2016, specifically the previously known Naledi Local Municipality formerly part of the Xhariep District was disestablished and merged into the Mangaung MM. The Metropolitan is home to seconds largest population distribution in the province with 787 803 people at 27.8% of the total population of the Free State Province.

The economy of the region is mostly driven by the governmental sector through programmes to improve livelihoods of its population, additionally the economy is supported by the finance sector by means of active estate and construction activities. Small businesses in the Mangaung MM have an important role in the economy of the region through employment, income generation and output growth. Although unemployment levels have risen in the region and the informal economy has made an important contribution to the region, as a result, the population are in need of alternative means of income.

The N1 national route runs through the Mangaung MM connecting Bloemfontein to Johannesburg and Cape Town, providing an important transportation route in South Africa. Additionally, the N8 national route connects the independent state of Lesotho and the Northern Cape Province via Bloemfontein. Bloemfontein is the sixth largest city in South Africa and known as the "City of Roses" originating from its Dutch meaning of fountain of flowers. Mangaung means the "Place of the Cheetahs" in Sesotho.

Figure 7.2: Towns within the Mangaung Metropolitan Municipality.

Mangaung Ward 48

Mangaung Ward 48 is one of 50 wards subdividing the Mangaung Metropolitan Municipality. The ward is situated from the western boundary of the metro bordering the Letsemeng Local Municipality to the west of Bloemfontein, only including a small section of the city. No major towns are situated within the region with most of the area covered by agricultural activities. The N8 national route traverse the ward and provides an important transportation route between Bloemfontein and Kimberley in the Northern Cape Province. Tourism activities are limited to a few guest farms and wedding venues. The "de Brug

Memorial" a memorial commemorating soldiers and their military personal who made the ultimate sacrifice while on UN (United Nations) deployment is situated in the region.

Acrux Solar PV Project Two (Pty) Ltd intends to develop a 650 MW photovoltaic solar facility and associated infrastructure on the Remaining Extent of Portion 1 of Farm Spes Bona No. 2355, Portion 10, of Farm Spes Bona No. 2355, and the Remaining Extent of the Farm Wolfkop 2353 situated within the Mangaung Metropolitan Municipality, area of jurisdiction. The City of Bloemfontein is located approximately 14 km east of the proposed development. The N8 national road is situated adjacent to the proposed development and the N1 national road 7.8 km to the east, additionally the R64 regional road is in close proximity and the main road used for access to the proposed development.

7.2 Biophysical Environment

The biophysical environment is described with specific reference to geology, 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 east where large scale urban development is present. The proposed solar PV facility is located adjacent to the proclaimed Highlands Nature Reserve, however, after further investigation, the visual impact assessment confirms that the reserve is only being used for cultivation farming with very low to no tourism potential. These features are described in more detail below.

A combined scoping assessment was undertaken for the proposed Quaggafontein Solar Cluster which includes Acrux Solar PV Project One; Acrux Solar PV Project Two and Mira Solar PV Project One. Specialists have applied a 500 m buffer to each of the projects listed above to create a Project Area of Influence (PAOI). The findings of the PAOI are presented below.

7.3 Geology and Soil Assessment

As part of the specialist desktop assessment, soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises of the division of land into land types as per Figure 7.3. below.

According to the land type database (Land Type Survey Staff, 1972 – 2006) the PAOI falls within the land type: Ca8 and Ca22. The geology for these land types is characterised by Sandstone, shale and/or mudstone, with dolerite intrusions.

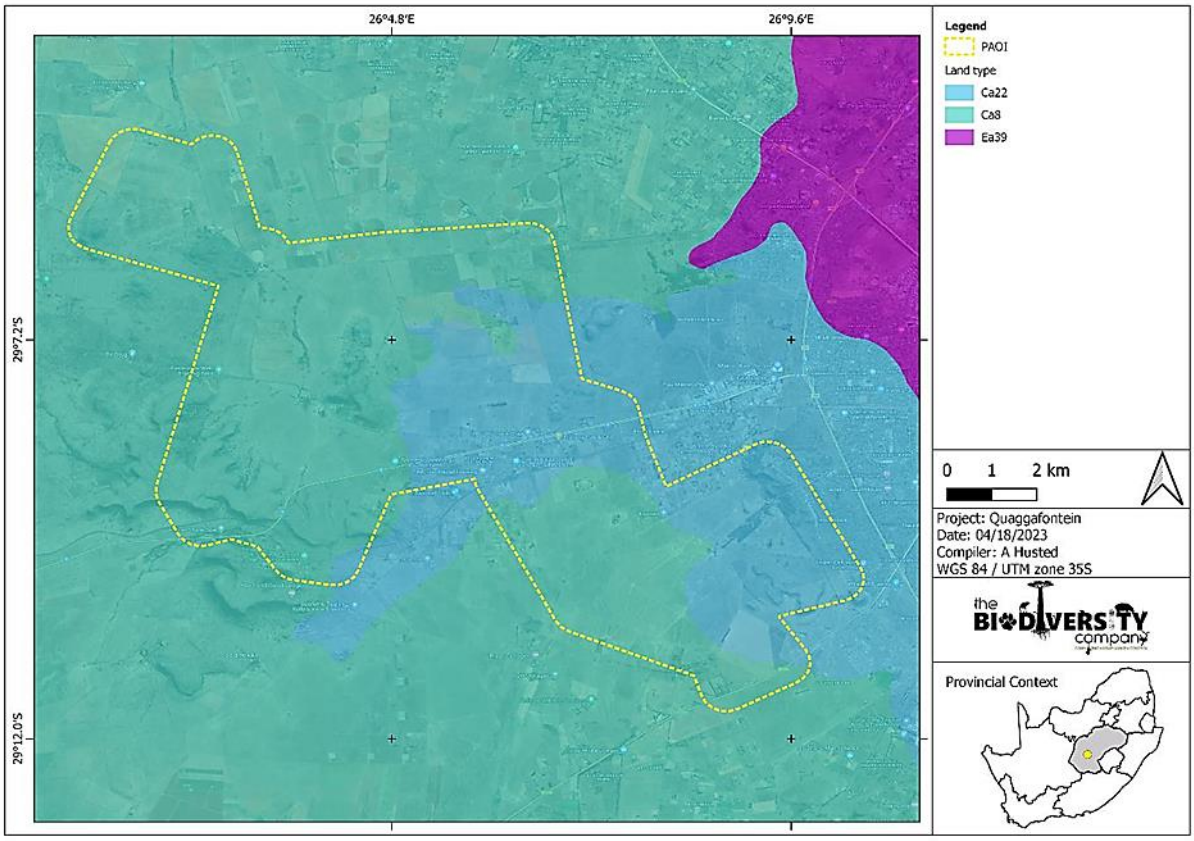

Figure 7.3: Land type data for the PAOI.

7.3.1 Land Capability Assessment

Fifteen land capabilities have been digitised by (DAFF, 2017) across South Africa, of which eight potential land capability classes are located within the PAOI, including;

- Land Capability 1 to 5 (Very low, Very low/Low to Low Sensitivity); and
- Land Capability 6 to 8 (Low/Moderate to Moderate Sensitivity).

The sensitivities as per the Department of Agriculture, Forestry and Fisheries (DAFF, 2017) national raster file indicated that the land capabilities range from low to medium across the PAOI with numerous areas identified as crop fields located within the PAOI. Refer to Figure 7.4 below.

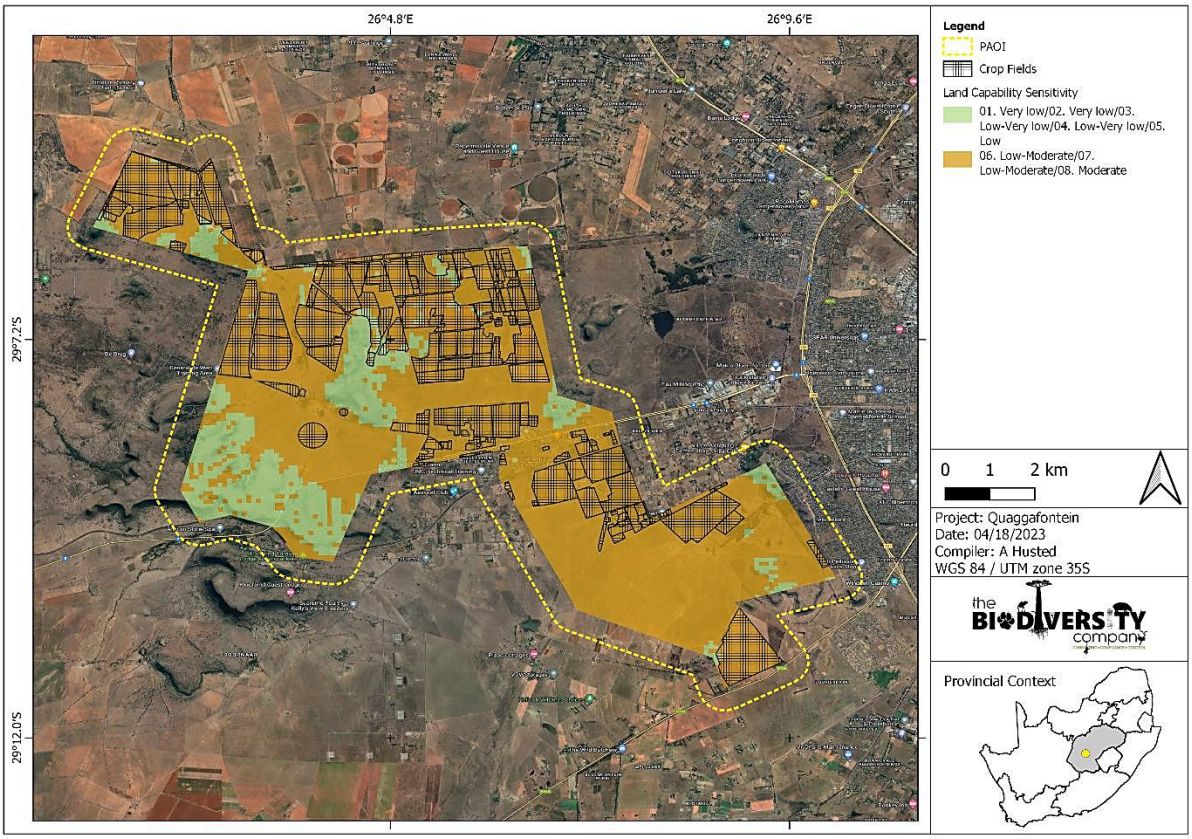

Figure 7.4: Land capability sensitivity.

Various soil forms are expected throughout the PAOI, of which some are commonly associated with higher land capabilities. Even though the soil depth, texture and permeability of these soils ensure higher land capability, the climatic capability of an area often reduces the land potential. The land capability sensitivities range from low to medium. Areas characterised by "High" land potential are expected for selected areas, specifically cultivated areas. The proposed development can result in the loss of land capability. The disturbances could further also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. The development of the area could also result in compaction and/or erosion. Furthermore, these activities could also cause leaks and/or spillages resulting in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants. The significance of these impacts will be determined after a field assessment has been conducted.

7.4 Floral Assessment

The following sections describe the local vegetation type that is expected to occur within the general PAOI.

7.4.1 Description of Vegetation

The PAOI is situated within the Grassland Biome. The Grassland Biome in South Africa occurs mainly on the Highveld, the inland areas of the eastern seaboard, the mountainous areas of KwaZulu-Natal and the central parts of the Eastern Cape. Grasslands characteristically contain herbaceous vegetation of a relatively short and simple structure that is dominated by graminoids, usually of the family Poaceae. Woody plants are rare (usually made up of low or medium-sized shrubs), absent, or confined to specific habitats such as smaller escarpments or koppies. Core grassland areas usually have deep, fertile soils although a wide spectrum of soil types do occur (Mucina & Rutherford, 2006).

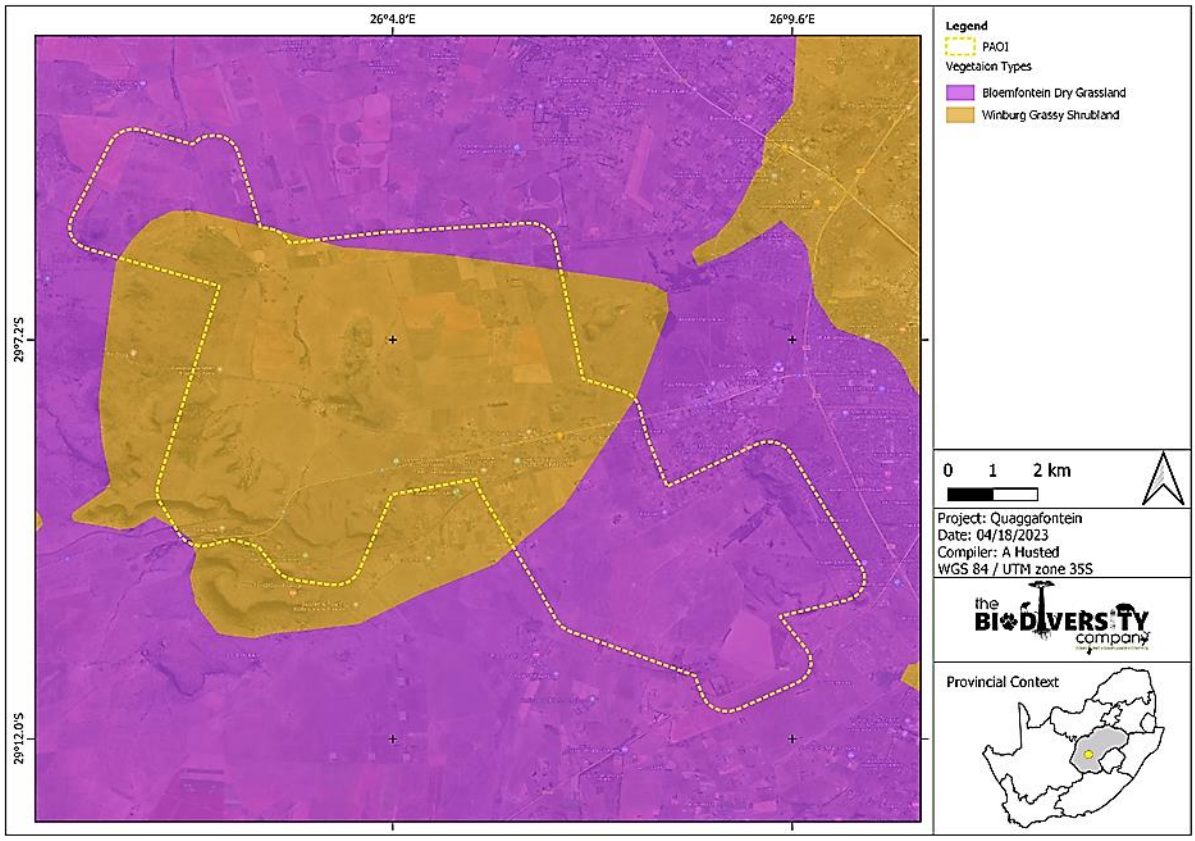

Figure 7.5: Map illustrating the vegetation types associated with the PAOI.

The Grassland Biome is comprised of four (04) parent bioregions and a total of 72 different vegetation types. The PAOI is situated within the Bloemfontein Dry Grassland and the Winburg Grassy Shrubland. The conservation status of the two vegetation types is Endangered and Least Threatened respectively. Refer too Figure 7.5 below.

7.4.2 Description of the Climate

This region is characterised as a summer-rainfall region, with Mean Annual Precipitation (MAP) around 500 mm. Much of the rainfall is of convectional origin. Overall Mean Annual Temperature (MAT) is slightly higher than 15°C, with more than 40 days of frost in winter (Mucina and Rutherford, 2006). Major macroclimatic traits that characterise the Grassland Biome include:

- Summer to strong summer rainfall and winter drought; and
- Frost is common, and fog is found on the upper slopes of the Great Escarpment and seaward scarps (Mucina & Rutherford, 2006).

7.4.3 Ecosystem Threat Status

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), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the proposed PAOI overlaps LC and NT ecosystems as per Figure 7.6 below.

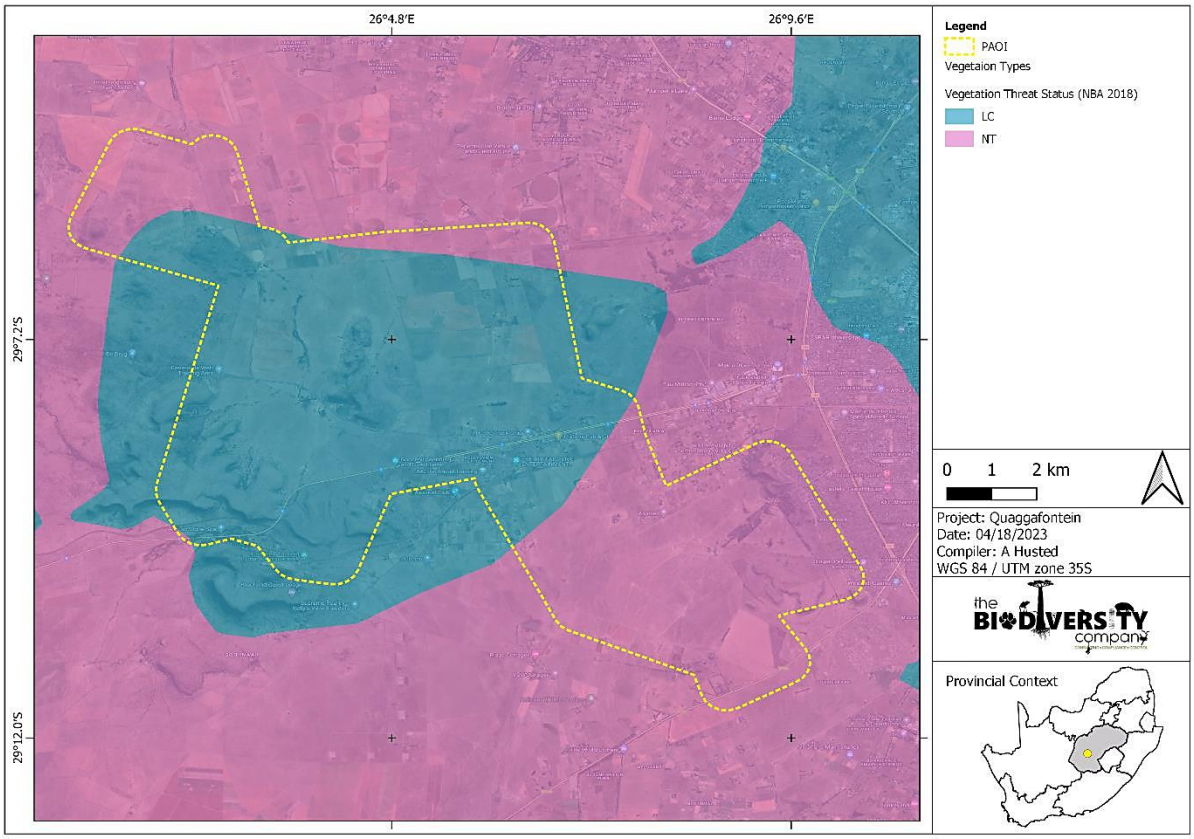

Figure 7.6: Map illustrating the ecosystem threat status associated with the PAOI.

7.4.4 Ecosystem Protection Level

This 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), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The proposed PAOI overlaps with a PP ecosystem as per Figure 7.7 below.

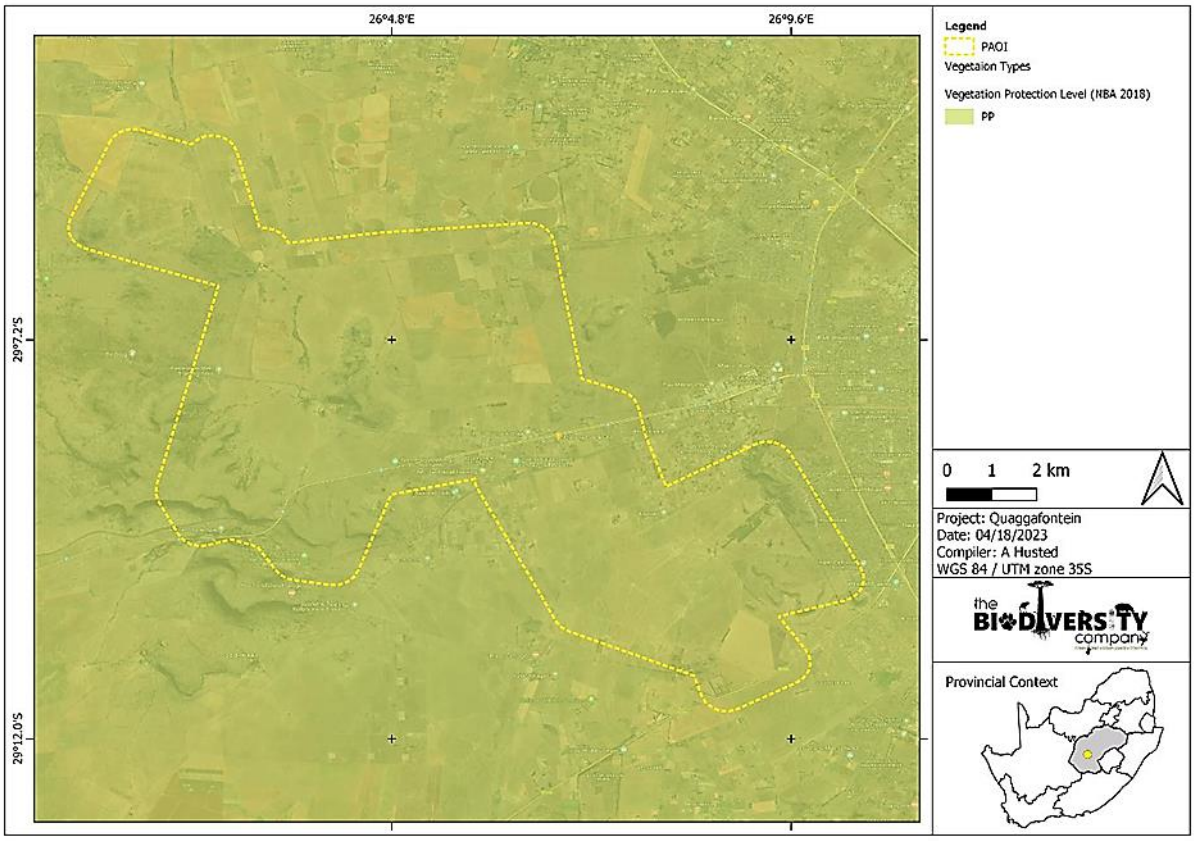

Figure 7.7: Map illustrating the ecosystem protection level associated with the PAOI.

7.4.5 Critical Biodiversity Areas and Ecological Support Areas

The Free State Province Biodiversity Plan classifies areas within the province on the basis of their contributions to reaching the associated conservation targets within the province. These areas are primarily classified as either Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species, as well as the long-term ecological functioning of the landscape as a whole. The following definitions apply:

- CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).
- ESAs are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).

Provincial CBAs and ESAs are often further classified into sub-categories, such as CBA 1 and CBA 2 or ESA 1 and ESA 2. These present fine scale habitat and biodiversity area baseline requirements and associated land management objectives or outcomes. The highest categorisation level is often referred to as a CBA 1 '*Irreplaceable Critical Biodiversity Area*' which usually represents pristine natural habitat that is very important for conservation.

Figure 7.8 shows the PAOI superimposed on the conservation plan. The PAOI overlaps with areas predominantly classified as Other Natural Areas and Degraded Areas. Notable areas classified as CBA 1 are also located within the PAOI.

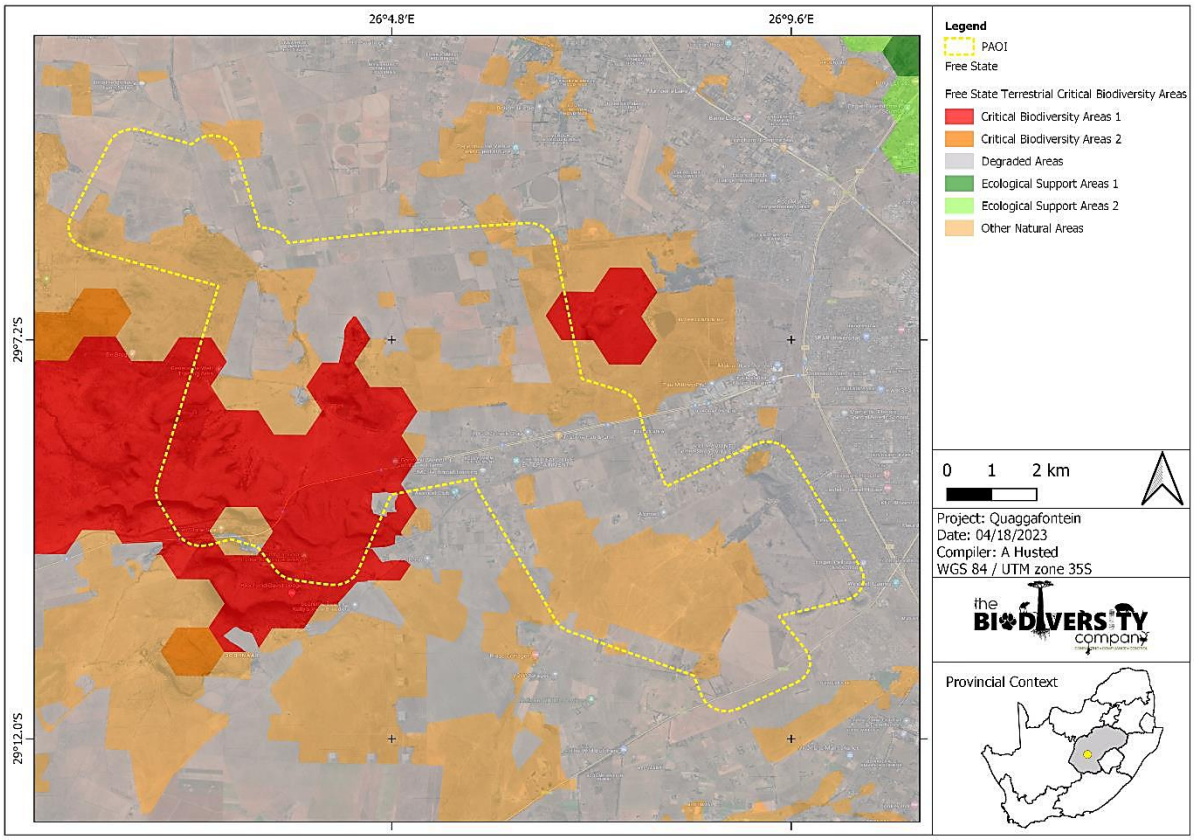

Figure 7.8: Map illustrating the locations of the PAOI in relation to the CBA map.

7.4.6 Protected Areas

The South Africa Protected Areas Database (SAPAD) contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD is updated on a continuous basis and forms the basis for the Register of Protected Areas, which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003. According to the protected area spatial datasets from SAPAD (2022) and SACAD (2022), the POAI overlaps with portions of the Highlands Reserve and Olievenkloof Private Nature Reserve. The proposed project footprints do not encroach into these areas as indicated in Figure 7.9 below.

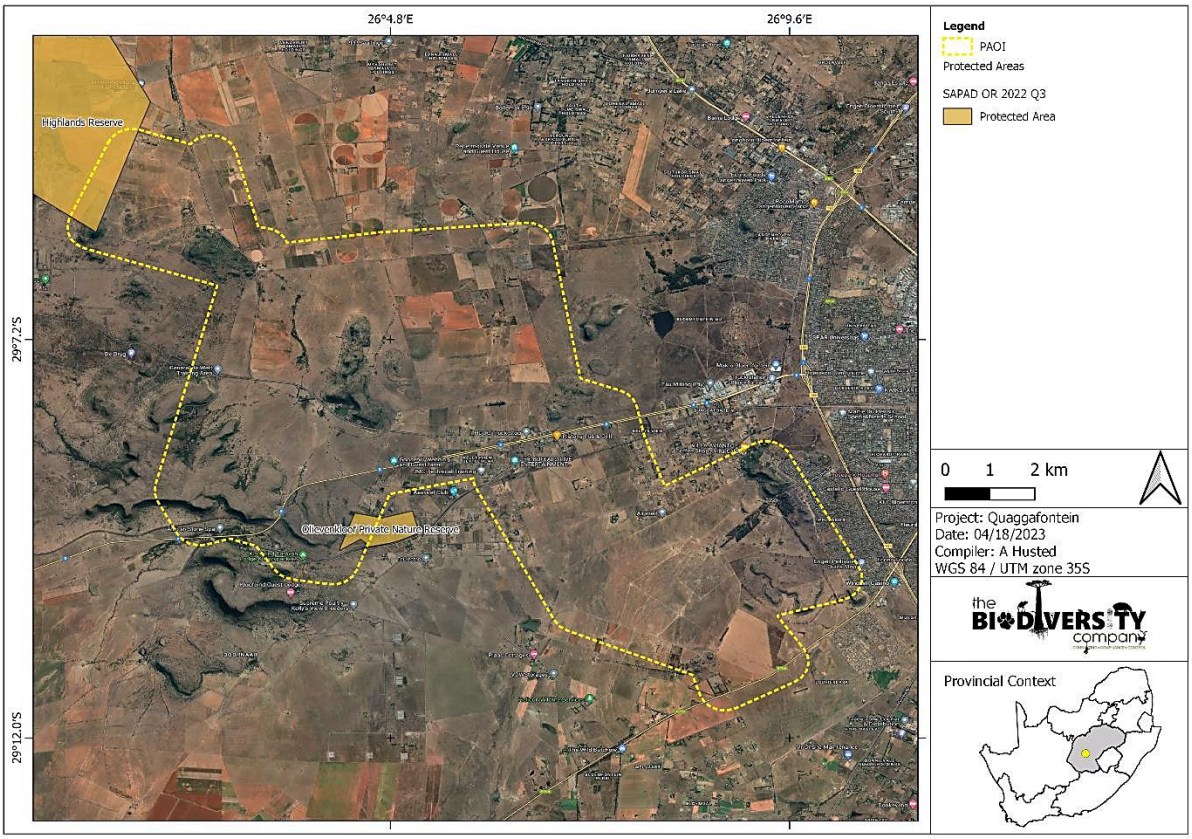

Figure 7.9: The PAOI in relation to the protected areas.

7.4.7 National Protected Area Expansion Strategy

National Protected Areas Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.

National Protected Area Expansion Strategy 2016 (NPAES) areas were identified through a systematic biodiversity planning process. They present 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 a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2016). The PAOI does overlap with NPAES areas, including Protected Areas and also Priority Focus Area as per Figure 7.10 below.

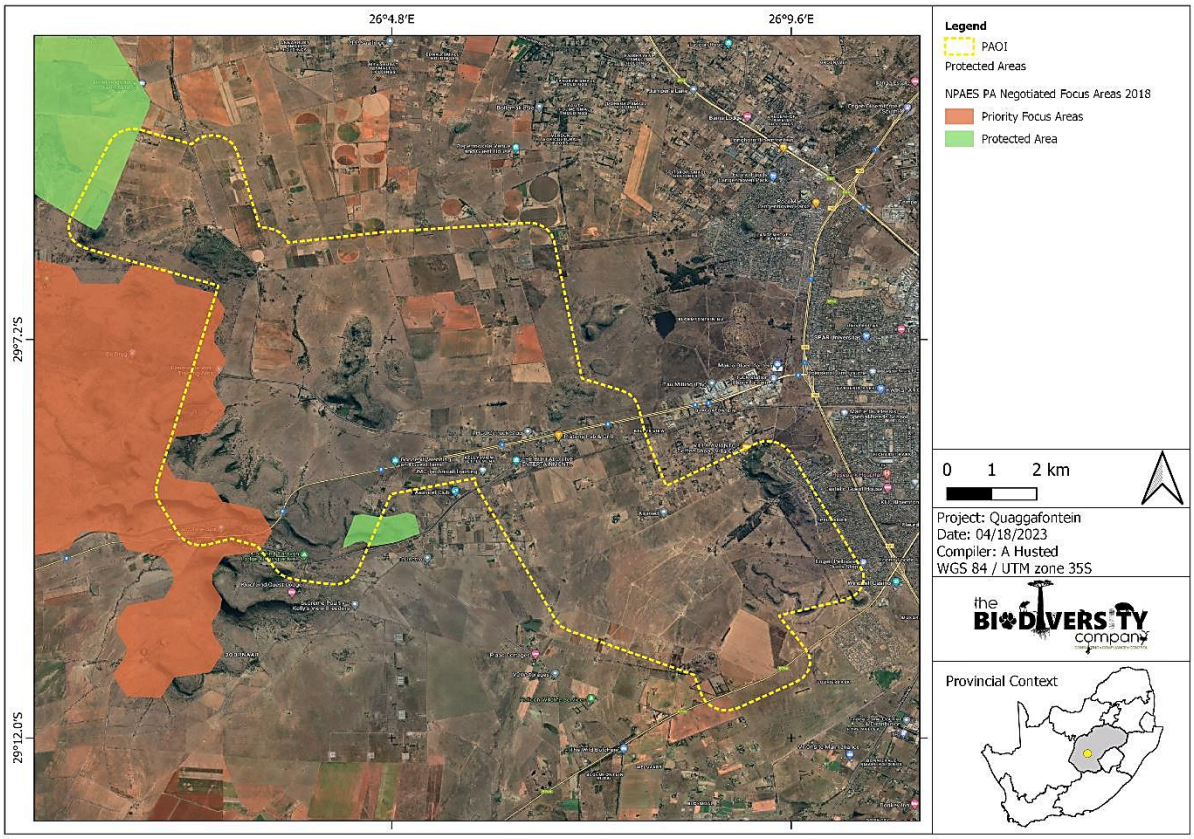

Figure 7.10: The project area in relation to the National Protected Area Expansion Strategy.

Based on the desktop assessment it can be said that the PAOI is sensitive with a moderate to high likelihood of species of conservation concern occurring. This assumption is based on the presence of CBA 1 and water resources in and around the project area.

The expectant anthropogenic activities are likely to drive habitat destruction, causing displacement of fauna and flora, and possibly even direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area. The significance of these impacts will be determined after a field assessment has been conducted.

7.5 Hydrological Setting

A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of the river and inland wetland ecosystem types as well as pressures on these systems. Strategic Water Source Areas (SWSAs) are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs is vital for national security because a lack of water security will compromise national security and human wellbeing.

7.5.1 National Freshwater Ecosystem Priority Area Status

The National Freshwater Ecosystem Priority Area (NFEPA) database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver et al., 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel et al., 2011). Figure 7.12 shows that the PAOI overlaps with unclassified FEPA wetlands, while several FEPA wetlands types are located within the PAOI.

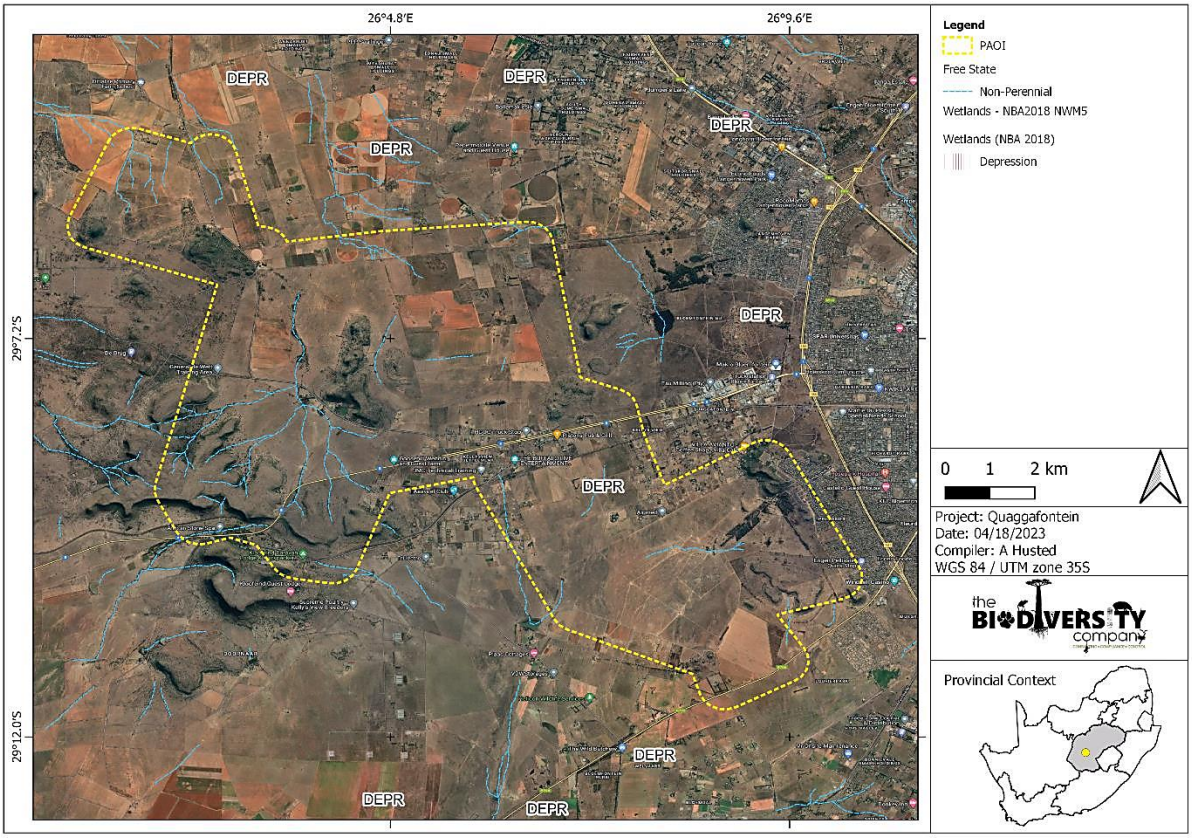

Figure 7.11: Map illustrating the ecosystem threat status of rivers and wetland ecosystems in the project area.

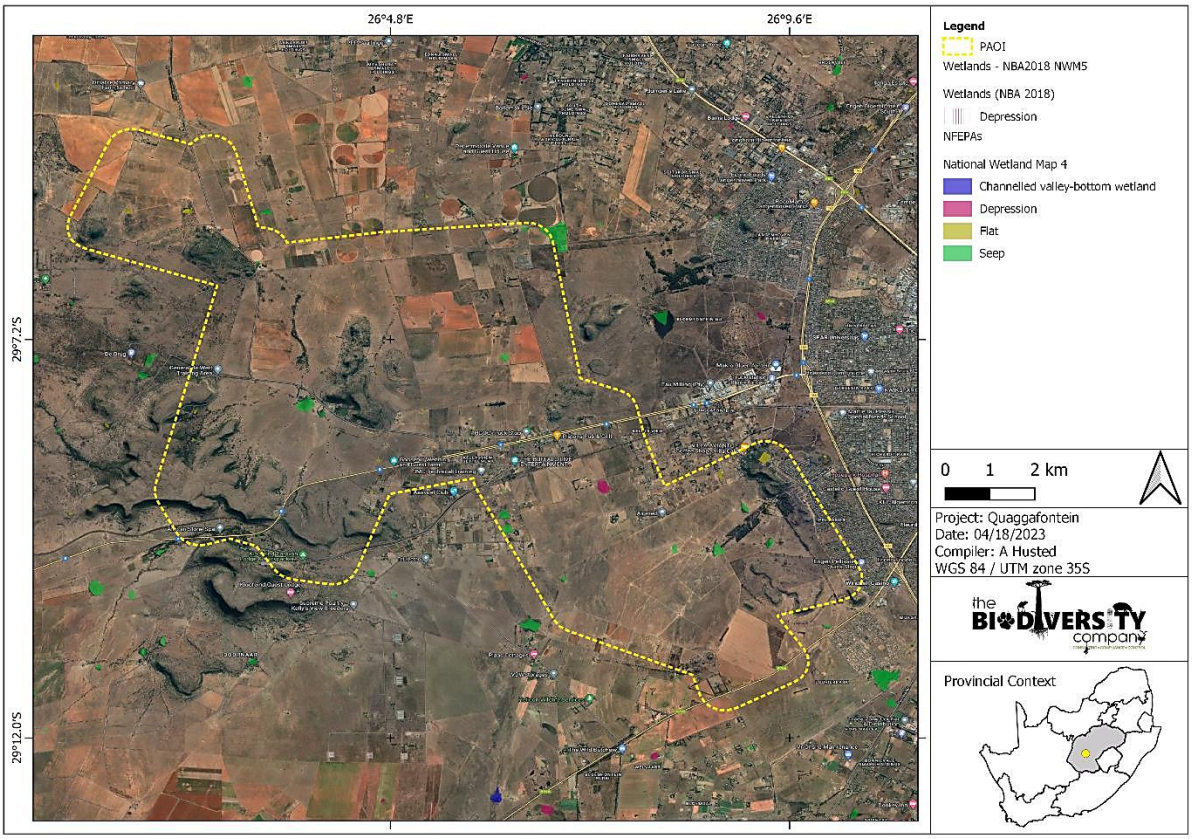

Figure 7.12: The project area in relation to the NFEPA & NWM5 datasets.

A key consideration for the impact assessment is the presence of the identified water resources in relation to the PAOI. Several wetlands within the PAOI, with several drainage lines also expected for the area. A Zone of Regulation (ZoR) of 500 m is applicable for any wetland system that is present beyond the project boundary.

Construction could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation, which would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to influence the associated biota. An increase in stormwater runoff could result in physical changes to the receiving systems caused by erosion, run-off and sedimentation, and the functional changes could result in changes to the vegetative structure of the systems. The significance of these impacts will be determined after a field assessment has been conducted.

7.6 Avifauna Assessment

Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria. The PAOI is located more than 20 km south of the Soetdoring nature Reserve IBA.

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and movement/flight corridors. The removal of natural vegetation may reduce the

habitat available for avifauna species and may reduce the species compositions within the area. The main impacts associated with avifauna is the loss of habitat, collision and electrocution risks.

7.7 Visual Assessment

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.

7.7.1 Visual Receptors

According to the Visual Impact Assessment (Appendix E2), visual receptors can be defined as: "*Individuals, groups or communities who are subject to the visual influence of a particular project*". Possible visual receptors identified within the 10 km radius landscape, which due to its land use could be sensitive to landscape change. They include:

Area Receptors	○ **A large number of smallholdings.** ○ **Bloemfontein and associated suburbs, including Quaggafontein.** ○ **General De Wet Shooting Range.** ○ **De Brug Military Base.**
Linear Receptors	○ N1 National Road. ○ N8 National Road adjacent to the SEF. ○ R64 regional road. ○ R706 regional road. ○ Abrahamskraal road. ○ Koppie Street adjacent to the SEF and grid options. ○ A secondary road adjacent to the SEF. ○ Other roads in and around Bloemfontein. ○ Private aerodromes.
Point Receptors	○ Homesteads on farms. ○ Lodging facilities.

7.7.2 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 tool used in this model does not take existing screening into account but only the above mean sea level of the landscape. Refer to the assumptions as indicated in Table 7.1 below.

Table 7.1: ZTV Assumptions.

Radius	Visibility rating in terms of proximity
0-1km	Very High
1-3km	High
3-5km	Medium
5-10km	Low

Table 7.2 below reflects the visibility rating in terms of proximity on sensitive receptors of the proposed solar PV facility. The ZTV maps will give a clearer understanding of areas susceptible to line of sight to the solar PV facility and both grid alternatives within a 10 km radius.

Table 7.2: ZTV rating in terms of proximity to the solar PV facility, excluding elevated landforms.

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	- Five homesteads on farms - Koppie Street - N8 National Road - Adjacent secondary road - Small section of smallholdings Visibility Coverage: 85.3%	Very High
1-3km	- 13 homesteads on farms - Koppie Street - Adjacent secondary road - Small sections of smallholdings - Olienkloof Nature Reserve - N8 National Road Visibility Coverage: 26.38%	High
3-5km	- 16 homesteads on farms - Koppie Street - Adjacent secondary road - Highlands Nature Reserve - Smallholdings Visibility Coverage: 10.8%	Medium
5-10km	- 23 homesteads on farms - Nine lodging facilities - Smallholdings - Highlands Nature Reserve - Abrahamskraal road - R64 regional road - One private airstrip - Small area of Bloemfontein - N1 National Road Visibility Coverage: 13.91%	Low

Figure 7.13 below illustrates the theoretical visibility as listed in Table 7.2 above.

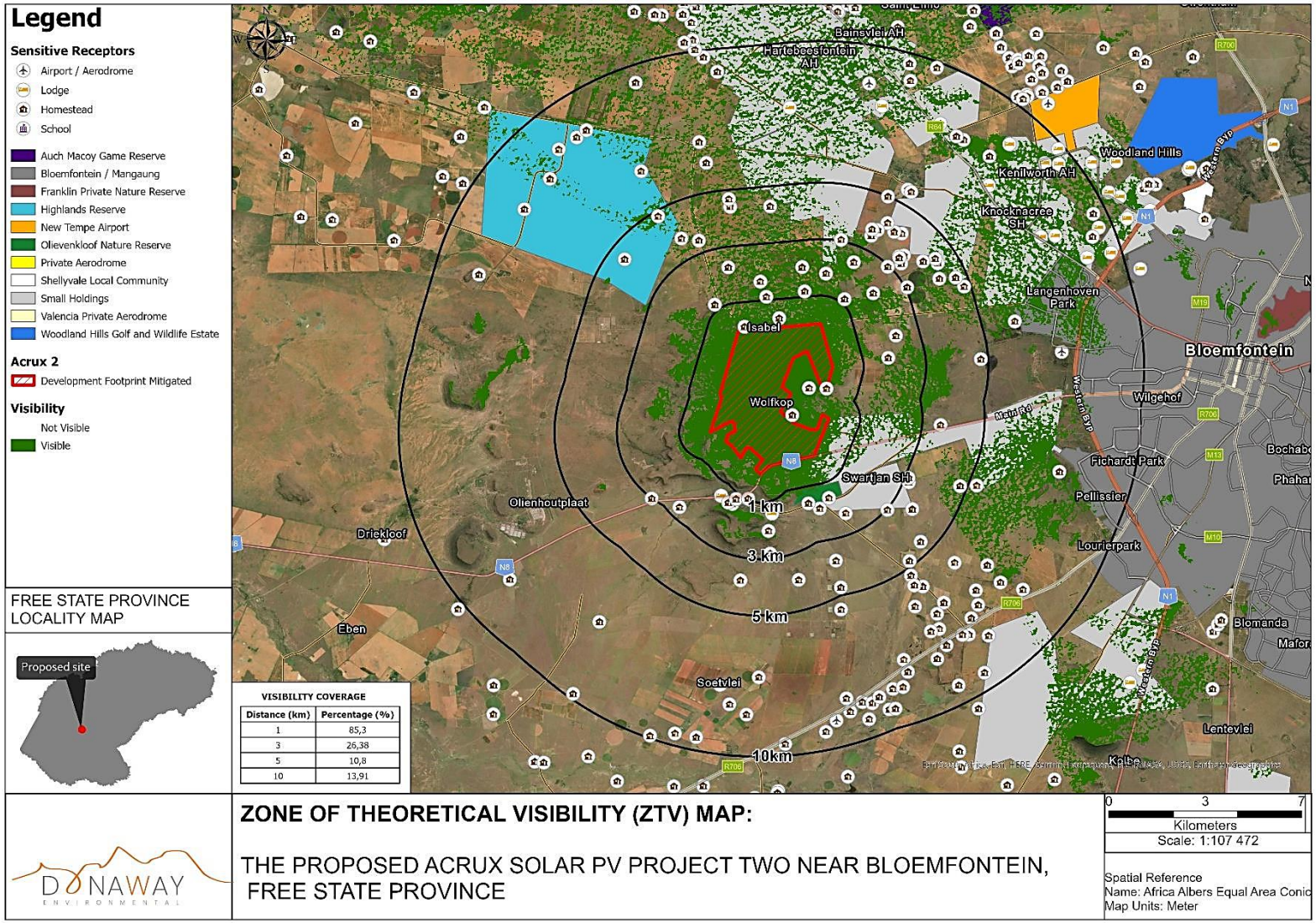

Figure 7.13: ZTV of the SEF, excluding elevated landforms.

Table 7.3: ZTV rating in terms of proximity to the solar PV facility, including elevated landforms.

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	- 10 homesteads on farms - Koppie Street - N8 National Road - Adjacent secondary road - Small section of smallholdings - Two lodging facilities - Olienkloof Nature Reserve Visibility Coverage: 94.54%	Very High
1-3km	- 18 homesteads on farms - Koppie Street - Adjacent secondary road - Smallholdings - Olienkloof Nature Reserve Visibility Coverage: 55.85%	High
3-5km	- 30 homesteads on farms - Koppie Street - Adjacent secondary road - Highlands Nature Reserve - Smallholdings - N8 National Road Visibility Coverage: 48.33%	Medium
5-10km	- 71 homesteads on farms - 12 lodging facilities - Smallholdings - Highlands Nature Reserve - Abrahamskraal road - R64 regional road - Three private airstrips - Small area of Bloemfontein - N1 National Road - R706 regional road Visibility Coverage: 50.23%	Low

Figure 7.14 below illustrates the theoretical visibility as listed in Table 7.3 above.

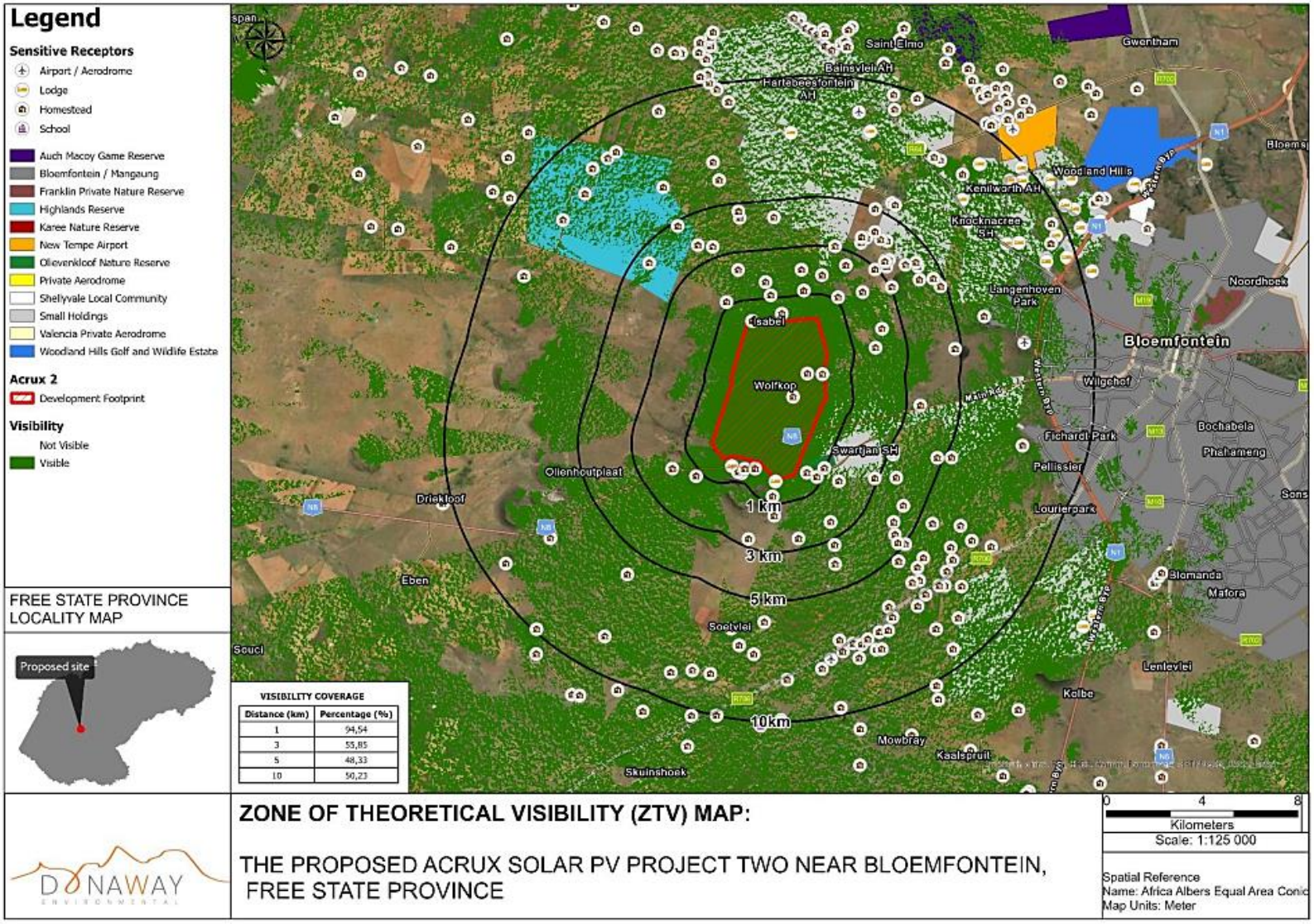

Figure 7.14: ZTV of the SEF, EIA footprint including elevated landforms.

The following note applies as per the visual impact assessment: The ZTV maps below reflect a negligible difference in visibility between Option 1 and Option 2 grid connections. The two grid connection options (power line routes) will have the same visual impact and only one assessment will be done which will be applicable to both options. This will be further assessed and updated during the detailed EIA phase.

Table 7.4: ZTV rating in terms of proximity to grid option 1 & 2.

Radius	Visual Receptors	Visibility rating in terms of proximity
0-1km	- Three homesteads on farms - Koppie Street Visibility Coverage: 97.11%	Very High
1-3km	- 27 homesteads on farms - Koppie Street - Smallholdings Visibility Coverage: 62.88%	High
3-5km	- Eight homesteads on farms - Smallholdings - Koppie Street - Abrahamskraal road - N8 National Road - Bloemfontein (suburb of Langenhoven Park) Visibility Coverage: 34.05%	Medium
5-10km	- 20 homesteads on farms - 16 lodging facilities - Smallholdings - One private airstrip - R64 regional road - Abrahamskraal road - N1 National Road - Small area of Bloemfontein - Highlands Nature Reserve - Olienkloof Nature Reserve Visibility Coverage: 14.08%	Low

Figure 7.15 and 7.16 below illustrates the theoretical visibility as listed in Table 7.4 above

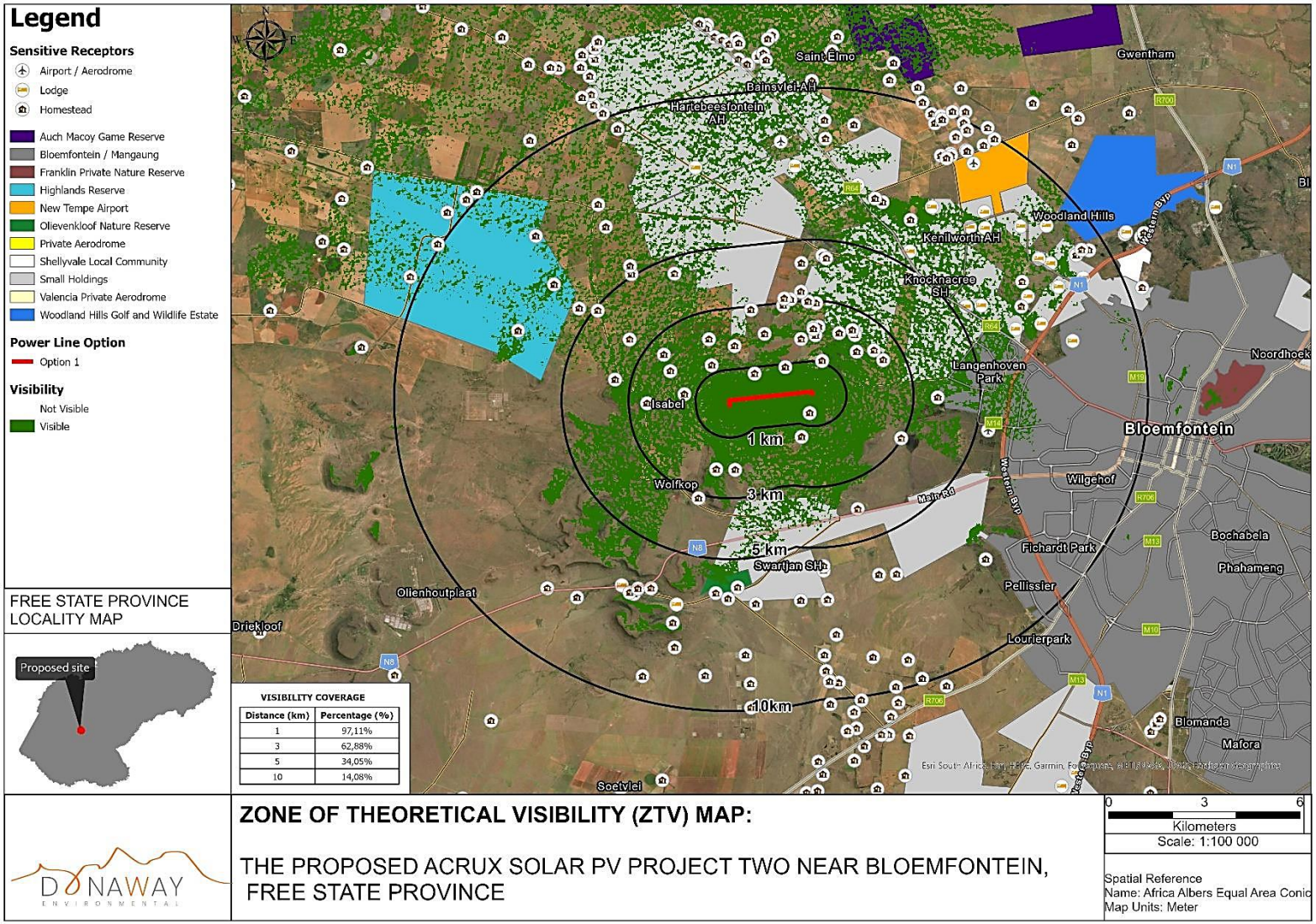

Figure 7.15: ZTV of grid option 1.

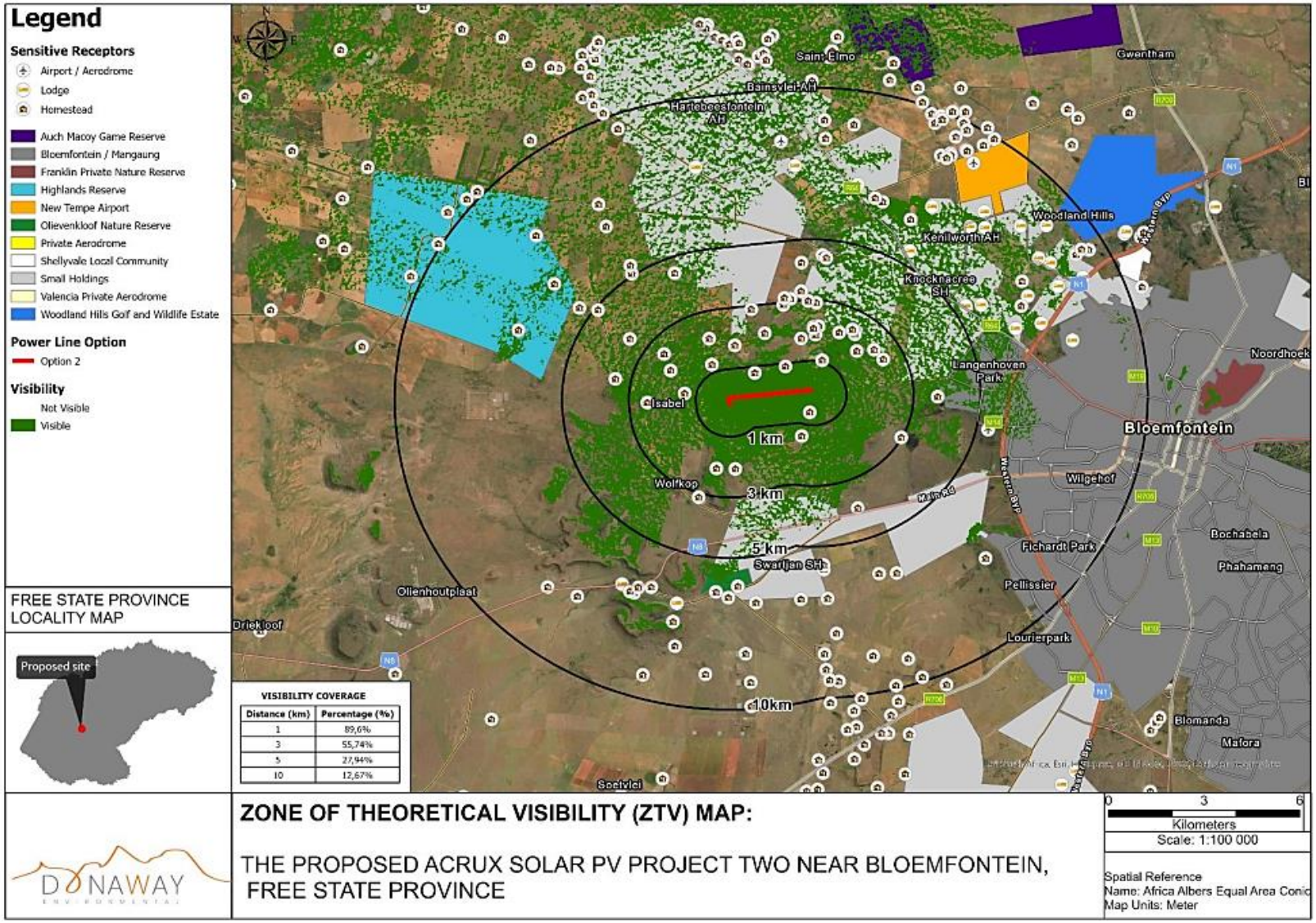

Figure 7.16: ZTV of grid option 2.

The significance of the visual impact will be expected to be a "*Negative Medium Impact*" after mitigation for the SEF and "*Negative Low*" for either grid options. 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 a farming landscape with a better visual appearance.

7.8 Cultural Heritage Assessment

In order to determine the feasibility of the project, a cultural heritage overview of the general area was provided by the independent heritage consultant in order to determine if there would be any red flag issues that might prevent the project from proceeding to the next level of investigation.

Note that since the report only provides a broad overview of the project area and further on-site investigation is required for the project, this heritage report will not be submitted to SAHRA. The report provided only serves as a source of information in support of the current scoping and screening phase of the process.

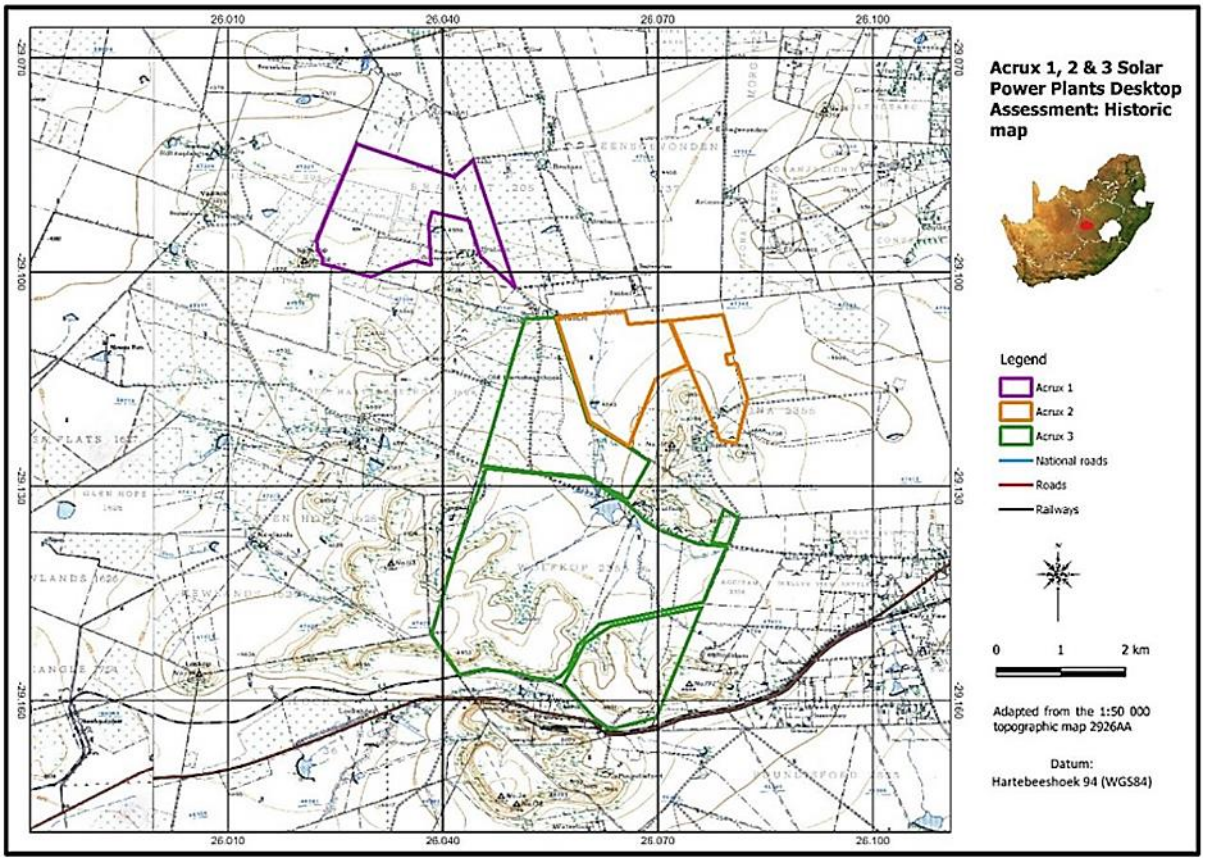

Figure 7.17: The project area indicated on the 1949 version of the 1:50 000 topographic map.

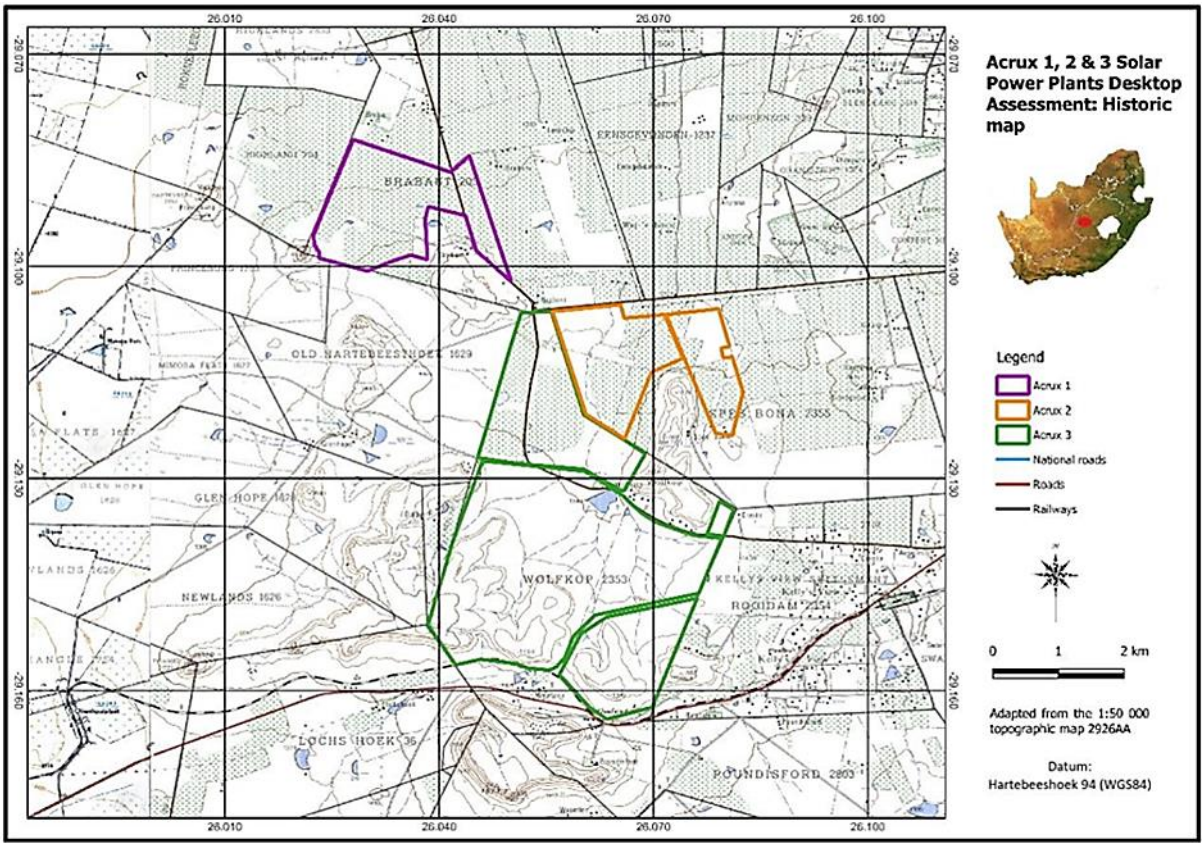

Figure 7.18: The project area indicated on the 1974 version of the 1:50 000 topographic map.

From a review of the available old maps and aerial photographs it can be seen that the project area has always been open space, with the main activity being agricultural fields.

The cultural landscape qualities of the region are made up of a pre-colonial element consisting of very limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component, which eventually gave rise to an urban component.

During the desktop screening, the following sites, features and objects of cultural significance were identified that could potentially lie within the project area.

7.8.1 Stone Age

Little is known about the Stone Age of the Bloemfontein region, as it was all destroyed by the rapid urban development in the region (Henderson 2004). Most sources indicate the presence of low-density surface scatters of MSA and LSA stone tools, mostly occurring on hills and outcrops surrounding the city.

Material dating to all phases of the Stone Age seems largely to be absent in the larger region. Only one previous heritage impact assessment done in the larger region indicated the presence of two tools dating from the Middle Stone Age. Although current information seems to indicate an absence of material dating to the Stone Age, it is expected that more will be found, especially near outcrops, stream beds and in sheltered valleys.

7.8.2 Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum,

millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating conditions that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the Witwatersrand and the treeless plains of the Free State.

Similar to the Stone Age, information on Iron Age settlement in the larger Bloemfontein region is lacking due to the urbanisation process. Only one reference to Iron Age sites in the larger region have been found. This is on Wolfkop and the eastern foot of the hill near the western portion of the farm. Unfortunately, not much information is given on these sites, although it is attributed to the Late Iron Age, c. 1600 and later. It is possible that more such sites can occur in this region, as well as in other areas where hills and outcrops occur.

7.8.3 Historic Period

When Major H D Warden was commissioned to serve as British Resident in the region between the Orange and Vaal Rivers, he bought the farm Bloemfontein from J N Brits in 1846 and established himself there. When the British government annexed the territory in 1848, Bloemfontein became the seat of the new administration. When the republic of the Orange Free State was established in 1854, the seat of government was moved from Winburg to Bloemfontein. The rise of Bloemfontein coincided with the discovery of diamonds in the decade 1860-1870 and the later discovery of gold in the ZAR (SESA 1970:366-372).

During the Second South African War (1899-1902), the town housed a large contingent of British troops. Most of their activities centred around what was to become known as Naval Hill. A concentration camp for women and children was set up on the western side of town, at the Tempe military base. Soldiers built long walls across the landscape, probably for defence, but also to keep busy and as a relieve of boredom. Numerous lookout posts, also referred to as sangars were constructed on hills and outcrops around the area where they kept watch over the landscape, fearing attacks from the Republicans (see Bennyworth 2004; Henderson 2004, 2006).

Two sites identified by SAHRA are of National significance (Grade I) are located in Bloemfontein to the east of the project areas:

- The grave of Mr Thomas Mapikela, a founding father of the ANC and an iconic leader of the liberation struggle, buried in the Hero's Acre in Phahameng Cemetery;
- The Waaihoek Wesleyan Church, seen as the birth place of the South African Native National Congress (SANNC), predecessor of the ANC.

There are approximately 31 sites identified by SAHRA as of Provincial significance (Grade II), located in Bloemfontein:

- These invariably consists of historic buildings and burial sites.

From a study of the available maps and aerial photographs, it seems as if elements of the built environment, i.e., farm houses, stock pens, water points and labourer accommodation and such is lacking in the proposed project area. This contrasts with the situation on other historic significant farms in the larger region: Bains Vlei, settled in 1847 by Andrew Hudson Bain; Onze Rust, which belongs to former

president of the Orange Free State, M.T. Steyn; Kwaggafontein that belonged to Sir Cornelis Hermanus Wessels, well-known political leader in the former Orange Free State Republic. At present it is unclear if any built features of significance occur in the project areas and this can only be verified during the site visit.

Although only a few have been identified during this desktop assessment, burial sites seem to have occurred all over in the larger countryside. They are usually indicated on the 1:50 000 topographic map and can then also be georeferenced in Google Earth. Significantly, all burial sites indicated on the older versions of map 2926AA, 1949 version, does not appear on the later maps and also cannot be seen on Google Earth. It is expected that informal type of burial sites will be identified in the project areas. For this, the input of local farm owners and workers would be invaluable as in many cases these sites are not very easy to detect.

The railway line between Bloemfontein and Kimberley, completed in 1908, passes on the south of the sites, bordering specifically on the southern side of the farm Wolfkop. It is expected that bridges and culverts dating to the original line and still in use will be located at river crossings. Typically, these are rough sandstone ashlar culverts for smaller stream crossings, whereas bridges would have longer spans, with the abutments and piers of sandstone. It is anticipated that these structures would not be impacted upon by the proposed development.

Based on the desktop assessment it is possible, with a large amount of certainty, to indicate that there are no obvious red flag issues that would prevent the project from proceeding to the next level of investigation, i.e., a full heritage impact assessment. However, this statement is subject to review until such time as a full field survey has been conducted.

7.9 Palaeontological Assessment

According to the Paleontological Impact (Appendix E5), the proposed Acrux Solar PV Project is underlain by Jurassic dolerite as well as the Balfour Formation (Adelaide Subgroup, Beaufort Group, Karoo Supergroup). Mantling these sediments is Quaternary superficial sediments. The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) indicates that the Palaeontological Sensitivity of the Adelaide Subgroup is Very High. Jurassic dolerite is igneous in origin, and unfossiliferous and thus has a Zero Palaeontological Sensitivity (Almond and Pether, 2009; Almond et al., 2013). Updated Geology compiled by the Council of Geosciences (Council for Geoscience, Pretoria) refines the geology and indicates that the proposed Acrux Solar PV Project Two is underlain by Karoo Dolerite and the Balfour Formation (Adelaide Subgroup, Karoo Supergroup).

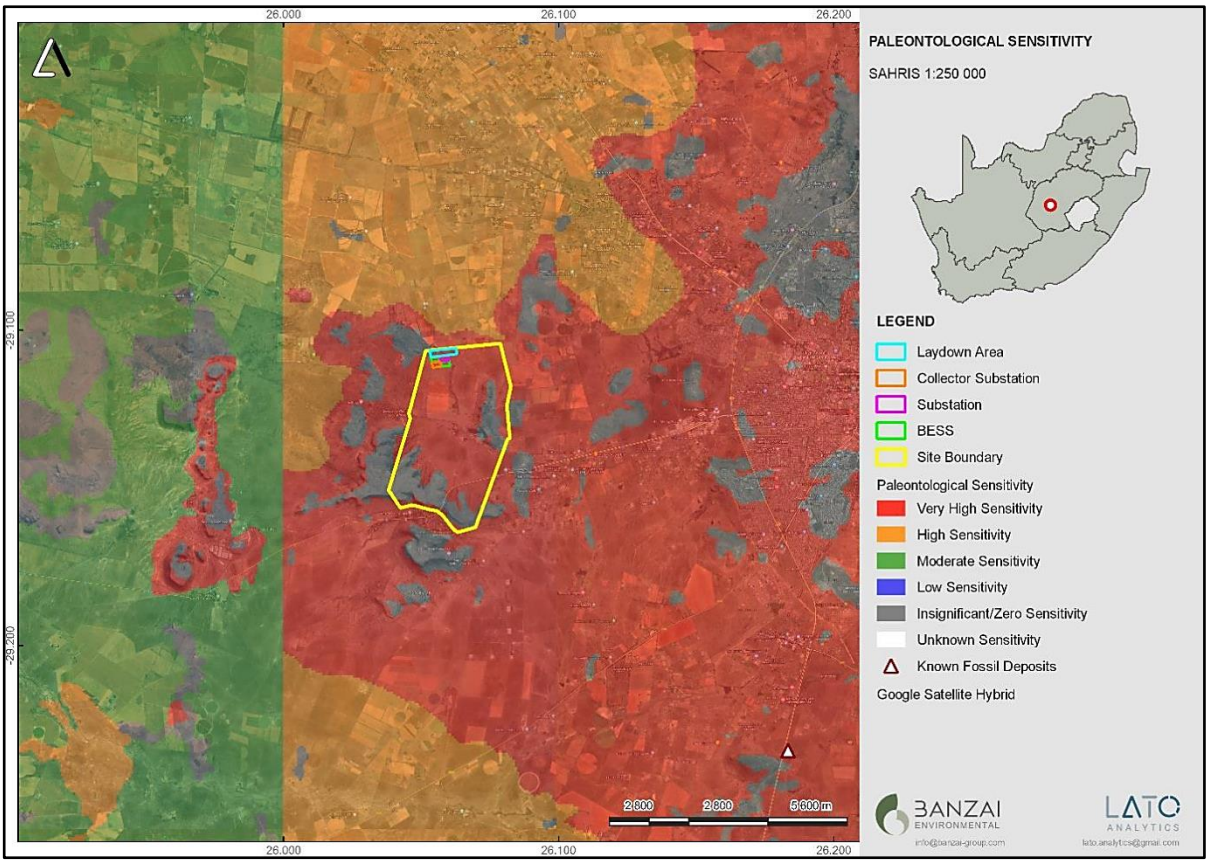

Figure 7.19: Extract of the SAHRIS PalaeoMap (Council of Geosciences) indicating that Acrux Solar PV Project Two is underlain by sediments with a Very High (red) and Zero (grey) Palaeontological Sensitivity.

A site-specific field survey of the development footprint was conducted on foot and by motor vehicle by the appointed specialist on 15-16 March 2023. No fossiliferous outcrop was detected in the proposed development. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the development footprint is rare. This is in contrast with the High Sensitivity allocated to the development area by the SAHRIS Palaeo-sensitivity Map and DFFE Screening Tool. A medium Palaeontological Significance has been allocated for the construction phase of the PV development pre-mitigation and a low significance post mitigation.

The construction phase will be the only development phase impacting Palaeontological Heritage and no significant impacts are expected to impact the Operational and Decommissioning phases. As the No-Go Alternative considers the option of 'do nothing' and maintaining the status quo, it will have a Neutral impact on the Palaeontological Heritage of the development. The Cumulative impacts of the development near Kroonstad is considered to be medium pre- mitigation and Low post mitigation and falls within the acceptable limits for the project. It is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area. The construction of the development may thus be permitted in its whole extent, as the development footprint is not considered sensitive in terms of palaeontological resources. It is consequently recommended that no further palaeontological heritage studies, ground truthing and/or specialist mitigation are required pending the discovery of newly discovered fossils.

If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO/site manager in charge of these

developments. These discoveries ought to be protected (if possible, in situ) and the ECO/site manager must report to SAHRA so that mitigation (recording and collection) can be carry out by a palaeontologist.

Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.

7.10 Concluding Statement

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 potential environmental sensitivities based on the preliminary assessments. The area proposed for development exclusively consists of land used for agriculture, but wetland features are located within the PAOI, as well as crop fields on or in close proximity to the site and a historic homestead. These environmental sensitive features will need to be considered by the developer for the placement of the facility infrastructure within the development footprint. Further investigation will be undertaken to inform the detailed EIA phase of the project.

7.11 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 2: Content of the scoping report:

Requirement	Relevant Section
2(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint, including (iv) the environmental attributes associated with the alternatives 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 proposed Acrux Solar PV Project Two. The information is provided in order to assist the reader in understanding the receiving environment within which the project is proposed, 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.

8 IMPACT ASSESSMENT OF POTENTIAL ISSUES

The development of Acrux Solar PV Project Two has the potential to impact on the affected environment within which the project is proposed. This section of the draft Scoping Report identifies and explores the potential impacts and issues that may arise due to the development.

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 Acrux Solar PV Project Two, 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:

- Avifauna – refer to Appendix E1
- Terrestrial Ecology - refer to Appendix E1
- Wetlands - refer to Appendix E1
- Soils and Agricultural Potential - refer to Appendix E1
- Visual – refer to Appendix E2
- Social - refer to Appendix E3
- Heritage - refer to Appendix E4
- Palaeontology - refer to Appendix E5

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 Acrux Solar PV Project Two are discussed in the sections below. Impacts are identified for the construction, operation and decommissioning phases as relevant. It must be noted that the identified potential impacts will be assessed further in detail during the EIA Phase and the required mitigation and management measures will be refined and confirmed for the facility layout proposed to be developed.

8.1 Assessment of Potential Impacts and Issues

The potential impacts and issues are discussed per specialist field.

8.1.1 Potential Impacts on Terrestrial Ecology

A desktop assessment, and initial site survey has been undertaken by the ecologist which has considered and identified the potential impacts as well as potential no-go areas within which no development or disturbance is to be undertaken. It must be noted that the results of the terrestrial ecology impact assessment will be ground-truthed following the completion of the on-ground field-survey to be undertaken by the specialist during the wet season. Refer to Appendix E1 (combined specialist scoping report) for the desktop results.

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

The majority of terrestrial habitat expected in the Development Area consists of Least Threatened vegetation types, however species of conservation concern is also expected to occur in the area. The broader area considered in the desktop assessment, within which the Development Area is located, does also overlap with water resources.

Two protected areas and CBA1 areas are also located within the broader area. Based on the desktop assessment it can be said that the sensitivity rating of the Development Area will be medium to high, with protected areas and CBA1 areas likely assigned Very High sensitivity. The ridge habitat is associated with intact CBA1 and will therefore likely need to be avoided by the development footprint.

The specialist has provided a summary of the potential impacts that are expected to occur and that will be further assessed during the EIA Phase, including the provision of the impact significance ratings. The detailed study will also include the identification and description of habitats, identification of Site Ecological Importance, location and identification of species of conservation concern (SCC), location and identification of fauna and nests/dens and determine a suitable buffer for identified and confirmed sensitive features. Refer to Table 8.1.

Table 8.1: Summary of the impacts identified for terrestrial ecology

Potential Impact / Issue	Nature of the Impact	Extent of the Impact	No-Go Areas
Destruction, fragmentation and degradation of habitats and ecosystems	Direct Impacts: • Disturbance / degradation / loss to vegetation and habitats • Ecological corridors are disrupted • Habitat fragmentation Indirect Impacts: • Erosion risk increases • Fire risk increases • Increase in invasive alien species	Local	None identified at this stage
Spread and / or establishment of alien and / or invasive species	Direct Impacts: • Loss of vegetation and habitat due to increase in alien species Indirect Impacts: • Creation of infrastructure suitable for breeding activities of alien and/or invasive species • Spreading of potentially dangerous diseases due to invasive and pest species	Local	None identified at this stage
Direct Mortality of fauna	Direct Impacts: • Loss of the species of conservation concern • Loss of fauna diversity Indirect Impacts: • Loss of diversity and species composition in the area.	Local	None identified at this stage

	• Possible impact on the food chain		
Reduced dispersal / migration of fauna	Direct Impacts: • Loss of genetic diversity • Isolation of species and groups leading to inbreeding Indirect Impacts: • Reduced seed dispersal • Loss of ecosystem services	National / Local	None identified at this stage
Environmental pollution due to water runoff, spills from vehicles and erosion	Direct Impacts: • Pollution in waterbodies and the surrounding environment • Faunal mortality (direct and indirectly) Indirect Impacts: • Ground water pollution • Loss of ecosystem services	Regional / Local	None identified at this stage
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution	Direct Impacts: • Disruption/alteration of ecological life cycles due to noise • Reduced pollination and growth of vegetation due to dust • Faunal mortality due to light pollution (nocturnal species becoming more visible to predators) • Heat radiation could lead to the displacement of species Indirect Impacts: • Loss of ecosystem services	Local	None identified at this stage

Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	Direct Impacts: • Loss of species of conservation concern or TOPS species Indirect Impacts: • Loss of ecosystem services • Loss of genetic diversity	Local	None identified at this stage

8.1.2 Potential Impacts on Wetlands and Freshwater Ecology

A desktop assessment, including an initial site survey, has been undertaken by the wetland specialist which has considered and identified the potential impacts as well as potential no-go areas within which no development or disturbance is to be undertaken. It must be noted that the results of the wetland impact assessment will be ground-truthed following the completion of the on-ground field-survey to be undertaken by the specialist during the wet season. Refer to Appendix E1 (combined specialist scoping report) for the desktop results.

A key consideration for the scoping level impact assessment is the presence of the water resources located within /in proximity to the Development Area. The available data suggests the presence of several wetlands within the PAOI that has been considered by the specialist, with several drainage lines also expected for the area. A Zone of Regulation (ZoR) of 500 m is applicable for any wetland system that is present beyond the project boundary.

The specialist has provided a summary of the potential impacts that are expected to occur and that will be further assessed during the EIA Phase, including the provision of the impact significance ratings. The detailed study will also include the identification, delineation and characterisation of water resources, the undertaking of a functional assessment of the water systems, where applicable, and determine a suitable buffer width for the freshwater resources present in the development area. Refer to Table 8.2.

Table 8.2: Summary of the impacts identified for wetlands and freshwater ecology

Potential Impact / Issue	Nature of the Impact	Extent of the Impact	No-Go Areas
Disturbance / degradation to wetland soils or vegetation due to the construction of the facility and associated infrastructure, such as crossings	Direct Impacts: • Disturbance / degradation to wetland soils or vegetation Indirect Impacts: • Loss of ecosystem services	Local	Wetlands present within the Development Area
Increased erosion and sedimentation and contamination of resources	Direct Impacts: • Erosion and structural changes to the systems Indirect Impacts: • Sedimentation and contamination of the downstream reaches	Local	Wetlands present within the Development Area

8.1.3 Potential Impacts on Soil and Land Capability

A desktop assessment has been undertaken by the soil specialist which has considered and identified the potential impacts as well as potential no-go areas within which no development or disturbance is to be undertaken. It must be noted that the results of the soils impact assessment will be ground-truthed following the completion of the on-ground field-survey to be undertaken by the specialist. Refer to Appendix E1 (combined specialist scoping report) for the desktop results.

Various soil forms are expected throughout the Development Area and PAOI, of which some are commonly associated with higher land capabilities. Even though the soil depth, texture and permeability of these soils ensure higher land capability, the climatic capability of an area often reduces the land potential. Areas characterised by "High" land potential are expected for selected areas.

The development of the area could result in the encroachment into areas characterised by high land potential properties, which can ultimately result in the loss of land capability. These disturbances could also result in the infestation and establishment of alien vegetation, which in turn can have a detrimental impact on soil resources. Earthworks will expose and mobilise earth materials which could result in compaction and/or erosion. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages or breakages from any of these could result in contamination of soil resources, which could affect the salinity or pH of the soil, which can render the fertility of the soil unable to provide nutrition to plants. During the operational phase, the impacts associated with the solar PV array will be easily managed by best "housekeeping" practices.

The specialist has provided a summary of the potential impacts that are expected to occur and that will be further assessed during the EIA Phase, including the provision of the impact significance ratings. The detailed study will also include the identification and delineation of soil forms and determination of soil sensitivity. Refer to Table 8.3.

Table 8.3: Summary of the impacts identified for soils and land capability

Potential Impact / Issue	Nature of the Impact	Extent of the Impact	No-Go Areas
Compaction / soil stripping / transformation of land use which leads to loss of land capability	Direct Impacts: • Loss of soil / land capability Indirect Impacts: • Loss of land capability	Local	None identified at this stage
Erosion	Direct Impacts: • Loss of topsoil Indirect Impacts: • Loss of land capability	Local	None identified at this stage

8.1.4 Potential 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 Acrux solar PV Project Two. Refer to Appendix E2 for the Visual Impact Assessment.

Referring to the assessment score of the Visual Impact Assessment, the significance of the visual impact will be expected to be a "Negative Medium Impact" after mitigation for the solar energy facility and "Negative Low" for either of the grid connection corridor alternatives. 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 a farming landscape with a better visual appearance.

The construction and operational phase of the development will have a visual impact on the study area, especially within (but not restricted to) a 3 km radius of the proposed project. The visual impact will differ amongst places, depending on the distance. Receptors that might be the most sensitive are residents living and working on nearby farms, people travelling on the adjacent secondary/gravel road and especially the N8 National Road. Extreme safety measures should be implemented adjacent to the N8 National Road to avoid possible accidents.

The majority of visual impacts associated with the project are anticipated to occur during the operation phase of the development. Impacts during the construction phase are typical of the type of visual impacts generally associated with construction activities. 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 Acrux Solar PV Project Two is anticipated to operate for a minimum of 20 years. The facility will operate continuously, 7 days a week, during daylight hours. While the solar facility will be largely self-sufficient, monitoring and periodic maintenance activities will be required. Key elements of the Operation and Management (O&M) Plan include monitoring and reporting the performance of the solar facility, conducting preventative and corrective maintenance, receiving visitors, and maintaining security.

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 facility will be refurbished and upgraded to prolong its life.

Tables 8.4 – 8.17 below provides the visual impact assessment and mitigation measures of the potential impacts associated with Acrux Solar PV Project Two. This impact assessment will be refined and the results and recommendations confirmed during the EIA Phase.

Table 8.4: Visual during the construction phase for the solar facility

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 of construction activities on sensitive visual receptors: solar energy facility	Before mitigation	Negative	2	4	1	3	1	4	3	45	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	4	1	3	1	4	3	45	Medium (29-50)		
Mitigation Measures: 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 licenced 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 8.5: Visual during the construction phase for the grid connection

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 of construction activities on sensitive visual receptors: Grid	Before mitigation	Negative	2	4	1	2	1	4	2	28	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	4	1	2	1	3	2	26	Low (6-28)		
Mitigation Measures: 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 licenced 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 8.6: Visual impact within 1 km radius for the solar energy facility 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?
Visual impact on sensitive visual receptors within a 1km radius: solar energy facility	Before mitigation	Negative	2	4	4	3	3	4	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	2	3	2	3	3	4	3	51	High (51-73)		
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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.7: Visual impact within 1 km radius for the grid 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?
Visual impact on sensitive visual receptors within a 1km radius: Grid	Before mitigation	Negative	2	4	4	2	3	3	2	36	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	4	2	2	3	3	2	32	Medium (29-50)		
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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.8: Visual impact between 1 km and 3 km radius for the solar energy facility 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?
Visual impact on sensitive visual receptors between a 1km and 3km radius: solar energy facility	Before mitigation	Negative	2	4	3	3	4	4	3	60	High (51-73)	Yes	Yes
	After mitigation	Negative	2	3	2	2	3	3	3	45	Medium (29-50)		
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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.9: Visual impact between 1 km and 3 km radius for the grid 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?
Visual impact on sensitive visual receptors between a 1 km and 3 km radius: Grid	Before mitigation	Negative	2	3	4	2	3	3	2	34	Medium (29-50)	Ye s	Yes
	After mitigation	Negative	2	3	2	2	3	3	2	30	Medium (29-50)		
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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.10: Visual impact between 3 km and 5 km radius for the solar energy facility 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?
Visual impact on sensitive visual receptors between a 3 km and 5 km radius: solar energy facility	Before mitigation	Negative	2	3	2	2	3	3	3	45	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	2	2	3	3	2	28	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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.11: Visual impact between 3 km and 5 km radius for the grid 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?
Visual impact on sensitive visual receptors between a 3 km and 5 km radius: Grid	Before mitigation	Negative	2	2	4	2	3	2	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	2	2	3	2	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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.12: Visual impact between 5 km and 10 km radius for the solar energy facility 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?
Visual impact on sensitive visual receptors between a 5 km and 10 km radius: solar energy facility	Before mitigation	Negative	2	2	2	2	3	2	2	26	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	1	1	3	2	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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.13: Visual impact between 5 km and 10 km radius for the grid 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?
Visual impact on sensitive visual receptors between a 5 km and 10 km radius: Grid	Before mitigation	Negative	2	2	4	2	3	2	1	15	Low (6-28)	Yes	Yes
	After mitigation	Negative	2	2	2	2	3	2	1	13	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. Operations • Maintain general appearance of the facility as a whole.													

Table 8.14: 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?
Visual impacts of lighting at night on sensitive visual receptors in close proximity.	Before mitigation	Negative	2	4	1	2	4	4	3	51	High (51-73)	Yes	Yes
	After mitigation	Negative	2	1	1	1	1	2	2	16	Low (6-28)		
Mitigation Measures: Planning & Operation As far as practically possible: • Shield the source of light by physical barriers (walls, vegetation etc.) • 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. • Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes. • The use of night vision or thermal security cameras are very effective and can replace security lighting entirely.													

Table 8.15: 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?
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
	After mitigation	Negative	2	1	1	1	3	1	2	18	Low (6-28)		
Mitigation Measures: • No mitigation measures are required													

Table 8.16: Sense of place impacts during the operation of the solar energy facility

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 impacts on sense of place associated with the operational phase: solar energy facility	Before mitigation	Negative	2	3	2	3	3	4	3	51	High (51-73)	Yes	Yes
	After mitigation	Negative	2	3	2	3	3	4	2	34	Medium (29-50)		
Mitigation Measures: • It is believed that renewable energy resources are essential to the environmental well- being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. • The subjectivity towards the project in its entirety can be influenced by implementing public awareness campaigns. Though not a requirement, it is recommended that the proponent investigate implementing a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy, and/or hosting an 'open day' (subject to the land owner's consent) where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area. • Implement good housekeeping measures.												

Table 8.17: Sense of place impacts during the operation of the grid 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?
Visual impacts on sense of place associated with the operational phase: Grid	Before mitigation	Negative	2	3	2	2	3	3	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	1	2	3	2	2	26	Low (6-28)		
Mitigation Measures: • It is believed that renewable energy resources are essential to the environmental well-being of the country and planet (WESSA, 2012). Aesthetic issues are subjective, and some people find solar farms and their associated infrastructure pleasant and optimistic while others may find it visually invasive; it is mostly perceived as symbols of energy independence; and local prosperity. • The subjectivity towards the project in its entirety can be influenced by implementing public awareness campaigns. Though not a requirement, it is recommended that the proponent investigate implementing a "Green Energy" awareness campaign, educating the local community and potentially tourists on the benefits of renewable energy, and/or hosting an 'open day' (subject to the land owner's consent) where the local community can have the opportunity to view the completed project which may enlist a sense of pride in the renewable energy project in their area. • Implement good housekeeping measures.												

8.1.5 Potential 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 Acrux solar PV Project Two. Refer to Appendix E3 for the Social Impact Assessment.

The 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 Acrux Solar PV Project Two. 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.

There are some vulnerable communities within the area that may be affected by the development of the Acrux Solar PV Project Two 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 sufficiently significant to allow them to be classified as "fatal flaws".

Potential negative social impacts can be associated with the construction phase of the Acrux Solar PV Project Two, 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 Bloemfontein and surrounding communities can therefore be mitigated.

The development will introduce employment opportunities for people from the Bloemfontein and surrounding communities, especially during the construction phase with approximately 300 employment opportunities to be created. Most opportunities would be temporarily available during the construction phase with a limited number of permanent employment opportunities during the operational phase. This would reduce the dependency in the region and improve overall lifestyle quality. Employment opportunities will improve skill development in the community, providing workers with additional knowledge and skill that may be of value in future work-related opportunities.

The proposed project could also assist the Mangaung Metropolitan Municipality's economy in creating entrepreneurial growth and opportunities, especially local businesses in Bloemfontein involved in the provision of general material, goods and service during the construction and operational phases.

It should be noted that the perceived benefits associated with the Acrux Solar PV Project Two, which include renewable energy generation and local economic and social development, outweigh the perceived impacts associated with the project.

Tables 8.18 – 8.32 below provides the social impact assessment and mitigation measures of the potential impacts associated with Acrux Solar PV Project Two. This impact assessment will be refined and the results and recommendations confirmed during the EIA Phase.

Table 8.18: Direct and indirect 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 / enhanced?	Is the impact acceptable?
The creation of direct and indirect employment opportunities during the construction phase of the project	Before mitigation	Positive	2	4	1	1	1	2	2	22	Low (6-28)	Yes	Yes
	After mitigation	Positive	2	4	1	1	1	3	3	36	Medium (29-50)		
Enhancement: • 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 Mangaung MM, Free State 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 8.19: Economic multiplier effects during construction.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated / enhanced?	Is the impact acceptable?
Significance of the impact from the economic multiplier effects from the use of local goods and services	Before mitigation	Positive	2	2	1	1	1	2	2	18	Low (6-28)	Yes	Yes
	After mitigation	Positive	3	4	1	1	1	3	3	39	Medium (29-50)		
Enhancement: • 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 8.20: 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?
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	3	2	1	2	3	36	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	2	2	1	2	2	20	Low (6-28)		
Mitigation Measures: • The proposed site for the Acrux Solar PV Project Two 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 need 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 8.21: In-migration of people 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?
In-migration of labourers in search of employment opportunities, and a resultant change in population, and increase in pressure on local resources and social networks, or existing services and infrastructure	Before mitigation	Negative	2	2	4	3	4	3	2	36	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	2	4	3	3	2	1	16	Low (6-28)		
Mitigation Measures: • 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, 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 8.22: 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	1	1	1	1	2	3	24	Low (6-28)		

Mitigation Measures:

- Working hours should be kept within daylight hours during the construction phase, 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.
- The appointed EPC Contractor must appoint a security company 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.
- The EPC Contractor should implement a stakeholder management plan 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 8.23: Traffic impacts and disruptions 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 traffic disruptions and movement patterns during the construction phase	Before mitigation	Negative	3	4	2	2	1	1	3	39	Medium (29-50)	Yes	Yes
	After mitigation	Negative	3	3	2	1	1	1	3	33	Medium (29-50)		

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.
- The developer and EPC Contractor must ensure that the roads utilised for construction activities are either maintained in the present condition or upgraded if disturbed due to construction activities.
- The EPC Contractor must 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 8.24: 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?
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	4	1	1	1	2	4	44	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	1	1	1	2	3	30	Medium (29-50)		
Mitigation Measures: • 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 8.25: Loss of livestock and crops 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?
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	3	36	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	3	1	2	1	1	2	18	Low (6-28)		
Mitigation Measures: • 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 8.26: Intrusion 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?
Intrusion impacts from construction activities will have an impact on the area's "sense of place"	Before mitigation	Negative	2	4	2	1	1	2	4	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	1	1	1	1	3	27	Low (6-28)		
Mitigation Measures: • 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 8.27: Employment opportunities during operation.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated / enhanced?	Is the impact acceptable?
The creation of employment opportunities and skills development opportunities during the operation phase for the country and local economy	Before mitigation	Positive	3	3	3	1	3	2	1	15	Low (6-28)	Yes	Yes
	After mitigation	Positive	3	4	4	1	3	3	2	36	Medium (29-50)		
Enhancement: • 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 8.28: Development of non-polluting infrastructure.

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated / enhanced?	Is the impact acceptable?
Development of non-polluting, renewable energy infrastructure	Before mitigation	Positive	4	4	1	2	4	3	2	36	Low (6-28)	Yes	Yes
	After mitigation	Positive	4	4	1	2	4	3	2	36	Medium (29-50)		
Enhancement: • None identified.													

Table 8.29: Loss of agricultural land and productivity 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?
Loss of agricultural land and overall productivity as a result of the operation of the proposed project on an agricultural property	Before mitigation	Negative	1	3	2	3	3	3	2	30	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	2	1	2	2	2	2	22	Low (6-28)		
Mitigation Measures: • The proposed mitigation measures for the construction phase should have been implemented at this stage. • Mitigation measures from the Agricultural and Soil Report, should also be implemented.													

Table 8.30: Contribution to Local Economic Development (LED) during operation

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated / enhanced?	Is the impact acceptable?
Contribution to LED and social upliftment during the operation of the project	Before mitigation	Positive	4	4	2	1	3	2	3	48	Medium (29-50)	Yes	Yes
	After mitigation	Positive	4	4	3	1	3	3	4	72	High (51-73)		

Enhancement:

- 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 8.31:: Impact on tourism during the operation phase

Nature of the Impact	Status		Extent	Probability	Reversibility	Irreplaceability	Duration	Cumulative Effect	Magnitude	Impact Significance	Impact Rating	Can impact be mitigated / enhanced?	Is the impact acceptable?
The potential impact on tourism due to the establishment of the solar energy facility	Before mitigation	Positive / Negative	2	3	1	1	3	2	2	24	Low (6-28)	Yes	Yes
	After mitigation	Positive / Negative	2	3	1	1	3	2	2	24	Low (6-28)		

Enhancement / Mitigation Measures:

- Due to the extent of the project no viable mitigation measures can be implemented to eliminate the visual impact of the PV panels, but the subjectivity towards the PV panels can be influenced by creating a "Green Energy" awareness campaign, educating the local community and tourists on the benefits of renewable energy. Tourists visiting the area should be made aware of South Africa's movement towards renewable energy. This might create a positive feeling of a country moving forward in terms of environmental sustainability.

Table 8.32: Visual and sense of place 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?
Visual impacts and sense of place impacts associated with the operation phase of the solar energy facility	Before mitigation	Negative	2	4	1	3	3	3	3	48	Medium (29-50)	Yes	Yes
	After mitigation	Negative	2	3	1	2	3	2	2	26	Low (6-28)		

Mitigation Measures:

- To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed Acrux Solar PV Project Two, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard.

8.1.6 Potential Impacts on Heritage Resources

A desktop assessment has been undertaken by the heritage specialist which has considered and identified the potential impacts as well as potential no-go areas within which no development or disturbance is to be undertaken. It must be noted that the results of the heritage impact assessment will be ground-truthed following the completion of the on-ground field-survey to be undertaken by the specialist. Refer to Appendix E4 for the desktop results.

Note that since the report only provides a broad overview of the project area and further on-site investigation is required for the project, this heritage report will not be submitted to SAHRA. The report provided only serves as a source of information in support of the current scoping and screening phase of the process and includes discussion on pre-liminary impacts which will be verified further during the detailed EIA phase.

Based on the desktop assessment the following has been determined for the heritage landscape:

- Material dating to all phases of the Stone Age seems largely to be absent in the larger region. Only one previous heritage impact assessment done in the larger region indicated the presence of two tools dating from the Middle Stone Age. Although current information seems to indicate an absence of material dating to the Stone Age, it is expected that more will be found, especially near outcrops, stream beds and in sheltered valleys.

- Only one reference to Iron Age sites in the larger region have been found. This is on Wolfkop and the eastern foot of the hill near the western portion of the farm. Unfortunately, not much information is given on these sites, although it is attributed to the Late Iron Age, c. 1600 and later. It is possible that more such sites can occur in this region, as well as in other areas where hills and outcrops occur.

- From a study of the available maps and aerial photographs, it seems as if elements of the built environment, i.e., farm houses, stock pens, water points and labourer accommodation and such is lacking in the proposed project area. This contrasts with the situation on other historic significant farms in the larger region: Bains Vlei, settled in 1847 by Andrew Hudson Bain; Onze Rust, which belongs to former president of the Orange Free State, M.T. Steyn; Kwaggafontein that belonged to Sir Cornelis Hermanus Wessels, well-known political leader in the former Orange Free State Republic. At present it is unclear if any built features of significance occur in the development are and this can only be verified during the site visit to be undertaken during the EIA Phase.

- Although only a few have been identified during this desktop assessment, burial sites seem to have occurred all over in the larger countryside. They are usually indicated on the 1:50 000 topographic map and can then also be georeferenced in Google Earth. Significantly, the burial sites indicated on the older versions of map 2926AA, 1949 version, does not appear on the later maps and also cannot be seen on Google Earth. It is expected that informal type of burial sites will be identified in the project areas. For this the input of local farm owners and workers would be invaluable as in many cases these sites are not very easy to detect.

- The railway line between Bloemfontein and Kimberley, completed in 1908, passes on the south of the sites, bordering specifically on the southern side of the farm Wolfkop. It is expected that bridges and culverts dating to the original line and still in use will be located at river crossings. Typically, these are rough sandstone ashlar culverts for smaller stream crossings, whereas bridges would have longer spans, with the abutments and piers of sandstone. It is anticipated that these structures would not be impacted upon by the proposed development.

Although a significant number of heritage impact assessments have been undertaken in the immediate vicinity of the Development Area, it is clear that this area has of low presence of cultural heritage sites and features.

The details of the site-specific impacts (including the significance) will be provided for in the EIA Phase once the fieldwork has been completed, and the presence of heritage resources and features are confirmed where discovered. It is therefore not possible at this stage of the assessment to provide an accurate indication of what the impact of the development will be on heritage resources and features that are specific to the Development Area under assessment for Acrux Solar PV Project Two.

8.1.7 Potential Impacts on Palaeontological Resources

The palaeontologist has undertaken a detailed investigation and impact assessment to identify and consider the palaeontological impacts that could potentially be realised with the development of Acrux solar PV Project Two. Refer to Appendix E5 for the Palaeontological Impact Assessment.

A site-specific field survey of the development footprint was conducted on foot and by motor vehicle on 15-16 March 2023. No fossiliferous outcrop was detected in the proposed development. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Based on the site investigation as well as desktop research it is concluded that fossil heritage of scientific and conservational interest in the Development Area is rare. This is in contrast with the High Sensitivity allocated to the Development Area by the SAHRIS Palaeosensitivity Map and DFFE Screening Tool (Appendix B).

A medium Palaeontological Significance has been allocated for the construction phase of the PV development pre-mitigation and a low significance post mitigation. The construction phase will be the only development phase impacting Palaeontological Heritage and no significant impacts are expected to impact the Operational and Decommissioning phases. It is therefore considered that the proposed development will not lead to damaging impacts on the palaeontological resources of the area.

Refer to Table 8.33 for the palaeontological impact assessment for Acrux Solar PV Project Two.

Table 8.33: Impact to palaeontological resources

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?
Destroy or permanently seal in fossils at or below the surface that are then no longer available for scientific study	Before mitigation	Negative	1	1	4	4	4	1	3	45	Medium (29-50)	Yes	Yes
	After mitigation	Negative	1	1	4	4	4	1	1	16	Low (6-28)		
Mitigation Measures: • If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO/site manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the ECO/site manager 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 mitigation (recording and collection) can be carry out by a palaeontologist. • Preceding any collection of fossil material, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be curated in an accredited collection (museum or university collection), while all fieldwork and reports should meet the minimum standards for palaeontological impact studies suggested by SAHRA.												

8.2 Consideration of Potential Cumulative Impacts

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 effected 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) other known approved solar energy projects / developments are present. It is unclear whether other projects not related to renewable energy is or has been or will be constructed in this area. In general, development activity in the area is focused agriculture. Agriculture in the area is primarily associated with cattle grazing and crop production.

Acrux Solar PV Project Two is proposed in an area which has historically been used for agricultural activities, and urban development. The Bloemfontein area and its surrounds (within which Acrux Solar PV Project Two is proposed) receive 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, adding to the cumulative impact of the overall area.

Table 8.34 provides a summary of related projects that may have a cumulative impact, in a 30 km radius of the Development Area. This information was obtained from the National Department of Forestry, Fisheries and the Environment (DFFE) website and is also based on knowledge from Blue Crane Environmental. Also refer to Figure 8.1.

Table 8.34: Renewable energy developments located within a 30 km radius of the Acrux solar PV Project Two Development Area.

Site name	Distance from project	Generation Capacity	Process	Project status
Letsatsi solar power farm, Free State Province	21.4 km	100 MW	Scoping and EIA	Approved
Portion 6 (Portion of Portion 5) of Farm Spes Bona 2355 Bloemfontein, Free State Province	0 km	5 MW	BAR	Approved
Portion 6 (Portion of Portion 5) of Farm Spes Bona 2355 Bloemfontein, Free State Province	0 km	5 MW	BAR	Approved
The Farm Mara No 2571, Near Woodland Hills Estate,	11.5 km	15 MW	BAR	Approved

Bloemfontein in The Free State Province				
Portion 1 and 9 of Spes Bona	0 km	75 MW	Scoping and EIA	Approved
Sonneblom photovoltaic solar energy fascility near Bloemfontein, Free State Province	25 km	84 MW	Scoping and EIA	Approved
Serurubele photovoltaic solar energy fascilty near Bloemfontein in Free State Province	25 km	84 MW	Scoping and EIA	Approved
Solaire Direct Glen Thorne Solar PV Facility 10MW near Bloemfoontein Mangaung Local Municipality, Free State Province	26.3 km	10 MW	BAR	Approved
Proposed Steenbok Solar 1, Steenbok Solar 2 and Steenbok Grid Connection on the remaining extent of the Farm Floradale No. 15 near Bloemfontein, Free State Province	18.6 km	35 MW per project	Scoping and EIA	In process
Acrux Solar PV Project One	750 m	-	Scoping and EIA	In process
Mira Solar PV Project One	6.8 km	-	Scoping and EIA	In process
Mira Solar PV Project Two	5.8 km	-	Scoping and EIA	In process

The impact of solar energy facilities on landscape connectivity is considered likely to be a key issue in certain parts of South Africa where there is a growing number of solar energy facility applications. Cumulative impacts are expected to be associated with the following:

- Loss of vegetation and species of conservation concern;
- Impacts on faunal habitats and sensitive faunal species, including avifauna;
- Impacts on soil resources, land use, and agricultural potential;
- Impacts on CBAs as defined by the Free State provincial authorities and broad-scale Ecological processes;
- Loss of heritage resources (including archaeological and palaeontological resources);
- Visual impacts; and

- Impacts on the social environment (both positive and negative).

In addition to cumulative impacts associated with the proposed development and other similar developments in the area, cumulative impacts are also to be considered at a site level. The potential direct cumulative impacts associated with the development is expected to be associated predominantly with the potential ecology impact, potential soil impacts, and potential impacts on visual and social aspects and features in the surrounding areas.

The above-mentioned impacts are considered to be probable, although it is anticipated that the extent, duration, and magnitude of these impacts can be minimised to levels where this impact can be regarded as having low significance through the implementation of appropriate mitigation measures. The impact associated with the proposed development is expected to be local, affecting mainly the immediate environment and surrounding areas, as well as other renewable energy facilities within the vicinity.

The operational lifespan of the project and other solar energy facilities within the surrounding areas is expected to be long-term (i.e., a minimum of 20 years) and subsequently the impact is also expected to be long-term.

Cumulative impacts will be fully assessed and considered in the EIA Phase. Each independent specialist report will consider and assess the cumulative impacts of proposed, approved and authorised renewable energy projects in the area.

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.

Cumulative impacts will be further explored and assessed as part of the EIA Phase.

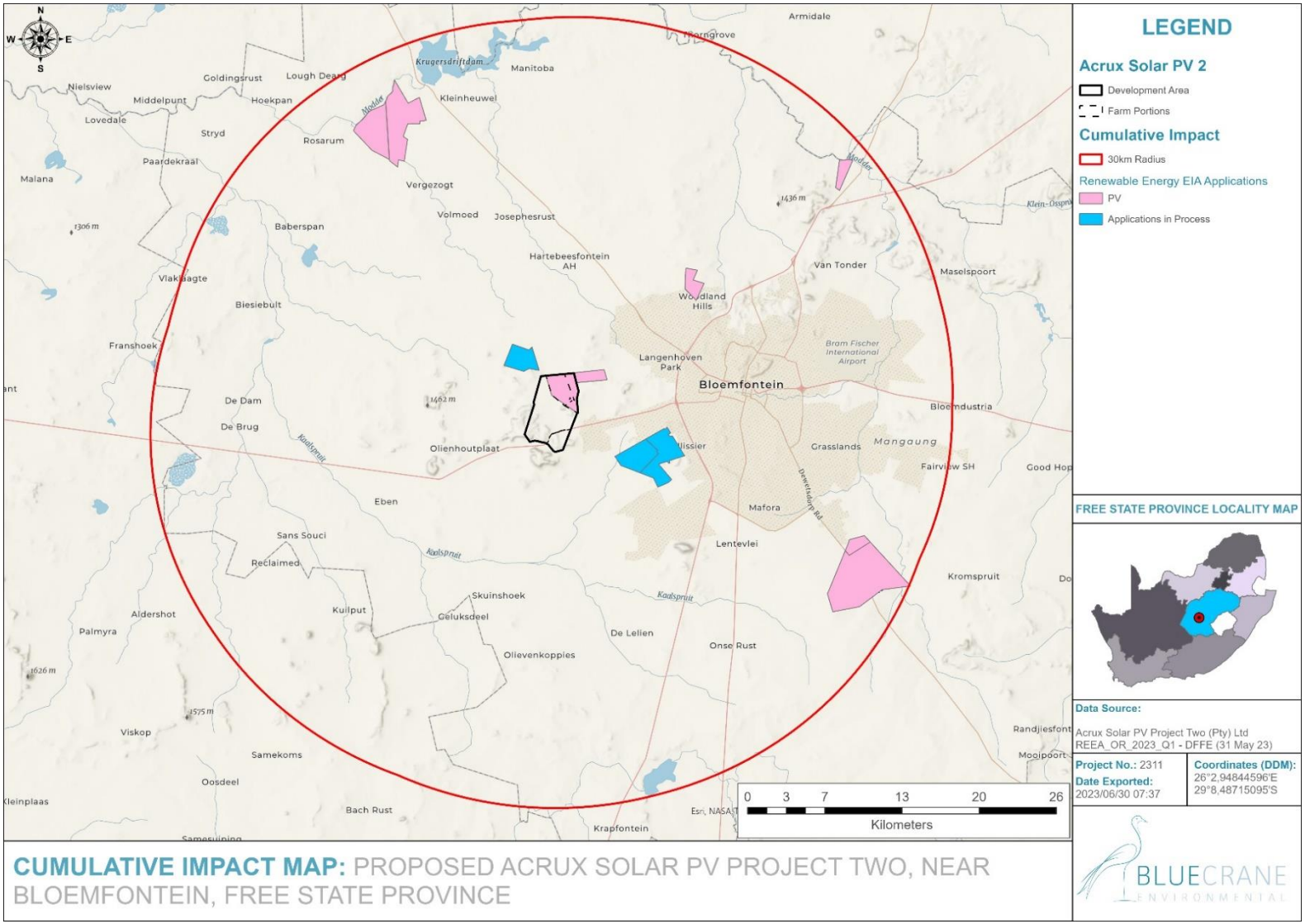

Figure 8.1: Cumulative map for the Acrux Solar PV Project Two

8.3 Site Sensitivity Analysis for the Facility Layout Design

A site sensitivity analysis is presented as part of the draft Scoping Report to consider the potential sensitive environmental features and areas present within the Development Area that will need to be considered by the Applicant for the placement and design of the development footprint.

The mitigation hierarchy explored as part of the site selection process (section 2.3) is further applied as part of the design of the development footprint. The Applicant will essentially be considering all confirmed and ground-truthed environmental sensitivities, and the recommended buffers, and thereby design a facility layout which avoids these no-go areas to ensure no disturbance is undertake, including the placement of infrastructure.

As the independent specialists are still in process of undertaking the fieldwork, the environmental sensitivities will only be refined in the EIA Phase, during which the draft facility layout will also be assessed to consider compliance of the layout with the environmental sensitivities and limitations. Further optimisation of the layout will then be undertaken by the Applicant where needed. Refer to section 2.4.1 for further detail in this regard.

From the inputs of the independent specialist studies to date areas of high and very high sensitivity are likely to be present within the development footprint. These areas are still to be confirmed and refined by the specialists. These include:

- Intact CBA1 areas that are specific to the ridge areas present within the development area specifically along the southern boundary and along the eastern boundary. These areas have been indicated to have a very high sensitivity.
- Water resources are distributed throughout the development area. These features have been indicated to have a high sensitivity.

Figure 8.2 provide the preliminary environmental sensitivity map for the development area that will be refined in the EIA Phase.

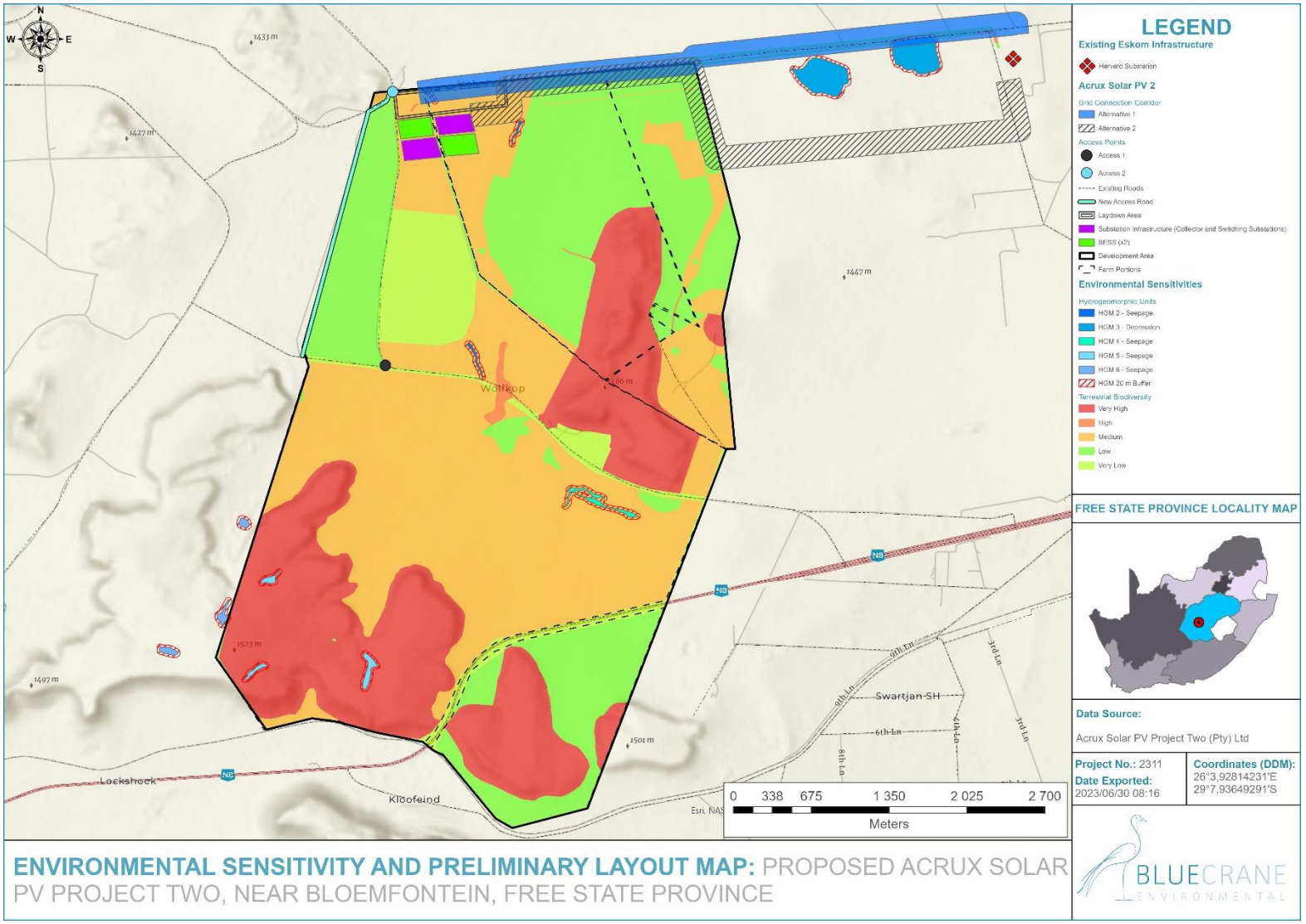

Figure 8.2: Preliminary environmental sensitivity map of the Acrux Solar PV Project Two Development Area.

8.4 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 2: Content of the scoping report:

Requirement	Relevant Section
2(g) a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint, including (v) the impacts and risks which have informed each alternative, including the nature, significance, consequence extent, duration and probability of such identified impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss pf resources; and (cc) can be avoided, managed or mitigated.	The potential impacts and risks identified to be associated with the development of Acrux Solar PV Project Two is considered in section 8.1.
2(g)(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 Acrux Solar PV Project Two 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.
2(g)(viii) the possible mitigation measures that could be applied and the level of residual risk.	Preliminary mitigation measures and recommendations for the management of the potential impacts and environmental sensitivities have been included in section 8.1.

9 EIA PLAN OF STUDY

The Plan of Study for the EIA Phase provides a description of how the EIA Phase will process and includes the details of the independent specialist studies.

One of the key objectives of the Scoping Phase is to determine the level of assessment required for the EIA Phase of the process, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks a particular activity will impose on a preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site.

9.1 Description of the Aspects to be Assessed

The EIA Report will be drafted with the objective of assessing the direct, indirect and cumulative environmental impacts and benefits associated with each phase of development including design, construction, operation, and decommissioning. The EIA Report will further provide the competent authority (in this case the Department of forestry, Fisheries and the Environment (DFFE) with detailed and sufficient information to make an informed decision on the Application for Environmental Authorisation.

The sections below provide an indication of the aspects to be assessed for Acrux Solar PV Project Two.

9.1.1 Aspects of the Development

A draft facility layout will be provided by the Applicant for assessment as part of the EIA Phase which considers the identified environmental sensitivities included in this Scoping Report. The draft layout will be assessed by Blue Crane Environmental and a range of independent specialists. The draft layout will illustrate the proposed locations of all infrastructure associated with the development of Acrux Solar PV Project Two, including the associated grid connection infrastructure.

9.1.2 Consideration of Alternatives

The following project alternatives will be investigated in the EIA Phase:

Alternatives considered	Description of the Alternative
Site specific and Layout Alternatives	One preferred site / development area has been identified for the development of Acrux Solar PV Project Two based on specific site characteristics such as the solar resource, land availability, topographical characteristics and environmental features. A preliminary development footprint will be provided by the Applicant for assessment. The footprint will be placed within development area of 2000 ha assessed within the Scoping Phase.
Activity Alternatives	Only the development of a renewable energy facility is considered by Acrux Solar PV Project Two (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 activities).
Technology Alternatives	The development of a photovoltaic solar facility is considered due to the characteristics of the site, including the natural resources available. Few technology options are available for solar PV facilities, and the use of those that are considered are usually differentiated by weather and temperature conditions that prevail on site, so that optimality is obtained by the final site selection. Solar energy is considered to be the most suitable renewable energy technology for this site, based on the site location, ambient conditions and energy resource availability. Solar PV was determined as the most suitable option for the proposed site, as large volumes of water are not required for power generation purposes compared to CSP technology. PV is also preferred when compared to CSP technology because of the lower visual profile.
Grid Connection Alternatives	In order to evacuate the generated electricity, the Applicant has identified two grid connection corridors under assessment for the placement of the overhead power line. Confirmation of the preferred alternative corridor will be based on feedback provided by the Eskom Grid Access Unit, and therefore one grid connection corridor will be approved for the placement of the power line infrastructure. The environmental aspects and characteristics of the corridors will also be considered to ensure that the preferred corridor is appropriate from an environmental perspective.
'Do-nothing Alternative	The option to not construct the Acrux Solar PV Project Two. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within or within the surrounding areas of the site. The opportunities associated with the development of the solar facility for the Bloemfontein area will however not be made available.

9.1.3 Aspects to be Assessed by the Independent Specialists

Specialists in their field of expertise will consider baseline data and identify and assess impacts based on the results of the completed fieldwork. Specialists will also recommend essential ways in which to mitigate negative impacts and enhance positive impacts. Further, specialists will, where possible, take into consideration the cumulative effects associated with this and other projects which are either developed or in the process of being developed in the local area. The specialist is reminded to follow the latest DFFE protocols.

Specialists' reports must comply with Appendix 6 of GNR. 326 published under sections 24(5), and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, where the DFFE protocols are not relevant to be complied with.

The following specialist studies will be undertaken as part of the EIA Phase:

- **Heritage Impact Assessment:** To determine whether the proposed activity will impact on any heritage or archaeological artifacts.
- **Terrestrial Biodiversity, Plant and Animal Species Impact Assessment:** To determine what the impact of the proposed activity will be on the ecology (fauna and flora) in the area.
- **Wetland Baseline and Risk Assessment:** To determine the impact of the proposed activity on the wetlands present within the Development Area / Development Footprint.
- **Avifauna Impact Assessment:** To determine what the impacts of the proposed activity will have on the birds (avifauna) in the area.
- **Visual Impact Assessment:** To determine to what extent the proposed activity will be visually intrusive to the surrounding communities or other receptors.
- **Soil and Agricultural Potential Impact Assessment**: To determine how the proposed activity will impact on soil and agricultural resources.
- **Social Impact Assessment:** To determine how the proposed activity will impact on the socio-economic environment.
- **Palaeontological Impact Assessment:** To determine the impacts on palaeontological resources.

The results of the specialist studies will inform the facility layout that will be put forward for environmental authorisation for Acrux Solar PV Project Two.

Table 9.1 below provides a summary of the aspects that will be assessed in detail in the EIA Report. The aspects are also linked to specialist information obtained.

Table 9.1: Aspects to be assessed by the independent specialists

Aspects	Potential impacts	Specialist studies / technical information
Construction of the solar energy facility	Impacts on the fauna and flora	Terrestrial Ecological Assessment and Avifauna Impact Assessment
	Wetlands and riparian areas	Wetland Baseline and Risk Assessment
	Impacts on agricultural potential (soils)	Soil and Agricultural Assessment
	Impacts on existing services infrastructure	Confirmation from the Local Municipality
	Temporary employment, impacts on health and safety	Social Impact Assessment
	Impacts on heritage resources	Heritage Impact Assessment and Paleontological Impact Assessment
Operation of the solar energy facility	Impacts on the fauna and flora	Terrestrial Ecological Assessment and Avifauna Impact Assessment
	Wetlands and riparian areas	Wetland Baseline and Risk Assessment
	Impacts on agricultural potential (soils)	Soil and Agricultural Assessment

	Increased consumption of water	Confirmed volumes to be provided by the Applicant
	Visual Impact	Visual Impact Assessment
	Provision of employment and generation of income for the local community	Social Impact Assessment
Decommissioning of the solar energy facility	Wetlands and riparian areas	Wetland Baseline and Risk Assessment
	Socio-economic impacts (loss of employment)	Social Impact Assessment
Cumulative Impacts	Cumulative biophysical impacts resulting from similar developments in close proximity to the proposed activity.	All independent specialist studies results are to be analyzed by the EAP to consider the impact of the project in isolation and the combined cumulative impact significance

9.2 Methodology to be Utilised for the Impact Assessment

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 9.2 provides the impact rating system applied in this draft Scoping Report.

Table 9.2: Impact rating methodology for the Impact Assessment.

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		
This describes the degree to which an impact can be successfully reversed upon completion of the proposed activity.		
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.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which resources will be irreplaceably lost as a result of a proposed activity.		
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.

CUMULATIVE EFFECT		
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.		
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		
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. 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.		
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.

9.3 Consultation with the Competent Authority

Consultation with the regulating authorities (i.e., DFFE and Free State DESTEA) will be undertaken and will continue throughout the EIA Phase. On-going consultation will include the following:

- Submission of a Final Scoping Report following the 30-day public review period (and consideration of comments received).
- Submission of a draft EIA Report, inclusive of an Environmental Management Programme, for review and comment.
- Submission of a Final EIA Report following a 30-day public review period (and consideration of comments received).
- Consultation with DFFE and Free State DESTEA (if required) in order to discuss the findings and conclusions of the Final EIA Report.
- Follow-up with the DFFE regarding the decision and provide feedback where queries for certainty are required from the Department.

9.4 Public Participation during the EIA Phase

A public participation process will be undertaken during the EIA Phase. Consultation with key stakeholders and I&APs will be on-going and through this consultation process, stakeholders and I&APs will be encouraged to verify that their issues were recorded in the Scoping Phase and to identify additional issues of concern or highlight positive aspects of the proposed project, and to comment on the findings of the EIA Phase. To accommodate the varying needs of stakeholders and I&APs within the study area, as well as capture their inputs, various opportunities will be provided for stakeholders and I&APs to be involved in the EIA Phase of the process, as follows:

- Telephonic consultation sessions where significant comments are raised and the I&APs have a need for discussion and further consultation, outside of written correspondence.
- Written, faxed or e-mail correspondence.
- A Public Meeting will be held during the 30-day review period of the draft EIA Report.

A draft EIA Report will be made available for a 30-day review period prior to finalisation and submission to the DFFE for decision-making. A non-technical summary will be distributed to all registered I&APs with the notification of the availability of the draft EIA Report for review and comment. All comments received during the public review period will be included within the final report to be submitted to the DFFE for review and decision-making.

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 2: Content of the scoping report:

Requirement	Relevant Section
2(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including (i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.	A description of the alternatives to be considered in the EIA Phase is discussed in section 9.1.2.
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process.	A description of the development aspects to be assessed in the EIA Phase is included in section 9.1.
(iii) aspects to be assessed by specialists.	A description of the aspects to be assessed by the independent specialists in the EIA Phase is included in section 9.1.3.
(iv) a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists.	The method to be applied for assessing the environmental aspects and impacts is included in section 9.2.
(v) a description of the proposed method of assessing the duration and significance.	The method to be applied for assessing the environmental aspects and impacts is included in section 9.2.
(vi) an indication of the stage at which the competent authority will be consulted.	The consultation to be undertaken with the competent authority is described in section 9.3.
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process.	The particulars of the Public Participation Process to be undertaken is included in section 9.4.
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process.	The tasks to be undertaken for the EIA Phase of the EIA process are fully described in section 9.
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	The independent specialists will identify suitable management and mitigation measures

10 CONCLUSION

The draft Scoping Report was undertaken with the main aim of identifying the potential impacts that may occur with the development of the proposed Acrux Solar PV Project Two.

The development of a solar energy facility on a site located on the Remaining Extent of Portion 1 of Farm Spes Bona No. 2355, Portion 10, of Farm Spes Bona No. 2355, and the Remaining Extent of the Farm Wolfkop 2353 may potentially result in both negative and positive environmental impacts that may need to be mitigated to ensure that the development is appropriate from an environmental perspective. The entire extent of a 2000 ha Development Area, and two grid connection corridor alternatives have been assessed as part of this draft Scoping Report.

Key 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.

Construction Phase Impacts:

- Impacts on fauna and flora including 1) destruction, loss and fragmentation of habitats, ecosystems and the vegetation community (- High), 2) introduction of Invasive Alien Plant (IAP) species and invasive fauna (- Medium), 3) destruction of protected plant species (- Medium), and 4) displacement of the indigenous faunal community (- High).
- Direct disturbance / degradation / loss to wetland soils or vegetation (- Medium) and increased erosion and sedimentation (- Medium).
- Visual impact of construction activities on sensitive visual receptors in close proximity to the Solar PV facility (- Medium).
- Loss of Land Capability (- Medium).
- Loss or damage to sites, features or objects of cultural heritage significance (burial sites and homestead site located on site) (- High).
- Destroy or permanently seal-in fossils at or below the surface that are then no longer available for scientific study (- Medium).
- Social impacts including 1) creation of direct and indirect employment opportunities (+ Medium), 2) influx of jobseekers and change in population in the study area (- Medium), 3) temporary increase in safety and security concerns associated with the influx of people (- Medium), 4) temporary increase in traffic disruptions and movement patterns (- Medium), 5) nuisance impact (noise and dust) (- Medium) and 6) increased risk of potential veld fires.

Operation Phase Impacts:

- Impacts on fauna and flora including 1) continued fragmentation and degradation of natural habitats and ecosystems (- Medium), 2) continuing spread of IAP and weed species (- Medium) and 3) ongoing displacement and direct mortalities of the faunal community (- High).
- Potential for increased stormwater runoff leading to Increased erosion and sedimentation (- Medium) and potential for increased contaminants entering the wetland systems (- Medium).
- Loss of Land Capability, soil erosion and compaction effects (- Medium).
- Social impacts including 1) creation of employment opportunities and skills development (+ Medium), 2) development of non-polluting, renewable energy infrastructure (+ Medium), 3) contribution to Local Economic Development (LED) and social upliftment (+ High), and 4) increase in household earnings.

Decommissioning Phase Impacts:

- Potential loss or degradation of nearby wetlands through inappropriate closure (- Medium).

From the independent specialist studies undertaken specific preliminary environmental sensitivities have been identified within the Development Area that may need to be avoided by the placement of the Development Footprint / facility layout. The areas not available for development will be confirmed once the specialist fieldwork and site surveys have been completed and the sensitive areas have been accurately delineated. The two most prominent features in the landscape that need to be considered for the design of the layout is:

- Intact CBA1 areas that are specific to the ridge areas present within the development area specifically along the southern boundary and along the eastern boundary. These areas have been indicated to have a very high sensitivity; and
- Water resources are distributed throughout the development area. These features have been indicated to have a high sensitivity.

The large extent of the Development Area (i.e., 2000 ha) 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 will consider all environmental sensitivities during the EIA Phase and design an appropriate facility layout that is considered to be acceptable, which will be further considered and assessed by the independent specialists during the EIA Phase. The acceptability of the preferred layout for the development will also be confirmed by the relevant independent specialists as part of the EIA Report, and where required further optimisation of the layout will be undertaken accordingly.

Based on the results of the draft Scoping Report, it is confirmed that no fatal flaws are relevant to the proposed development.

Blue Crane Environmental therefore confirms the suitability of the development within the assessed Development Area subject to the avoidance of the identified sensitive environmental features through the careful placement of the Development Footprint. The recommendation is therefore that the Scoping Phase (Scoping Report) and Plan of study for the EIA Phase be approved by the DFFE, after which the EIA Phase will commence as required in terms of Regulations 23 to 24 of the EIA Regulations, as amended.

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