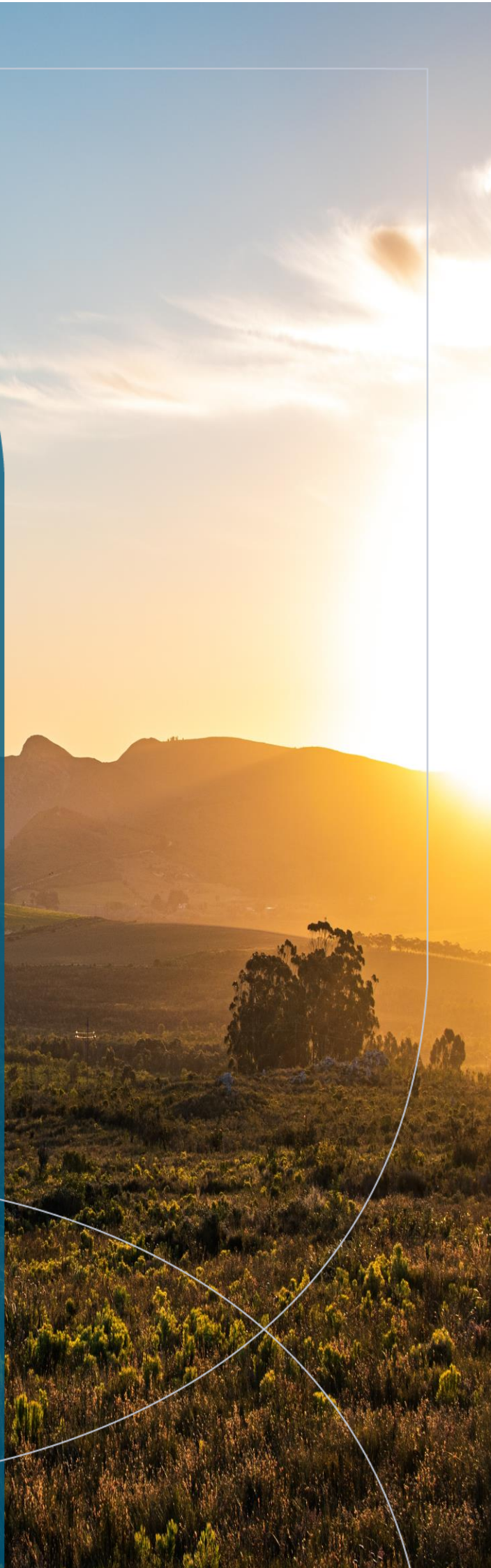
# DRAFT EIA REPORT

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

26 SEPTEMBER 2023



BLUECRANE ENVIRONMENTAL

# PROJECT DETAILS

| | | |
|---|---|---|
| DFFE Reference Number | : | 14/12/16/3/3/2/2358 |
| Project Title | : | The Proposed Acrux Solar PV Project One and Associated Infrastructure near Bloemfontein, Free State Province |
| Authors | : | Lisa de Lange and Roschel Maharaj (co-author) |
| Consultancy | : | Blue Crane Environmental (Pty) Ltd |
| Registered EAP | : | Lisa de Lange (2020/2150) |
| Applicant | : | Acrux Solar PV Project One (Pty) Ltd |
| Report Status | : | Draft EIA Report released for the 30-day review and comment period from 26 September 2023 to 26 October 2023 |
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# GLOSSARY OF TERMS AND ACRONYMS

| | |
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| 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 Independent Power Producer Procurement Programme |
| SAHRA | South African Heritage Resources Agency |
| SCC | Species of Conservation Concern |
| SDF | Spatial Development Framework |
| S&EIA | Scoping and EIA Process |
| SPP | Solar Power Plant |
| VU | Vegetation Unit |

# INVITATION TO COMMENT

Acrux Solar PV Project One (Pty) Ltd is proposing the development of a photovoltaic solar energy facility and associated infrastructure (known as Acrux Solar PV Project One) for the purpose of commercial electricity generation on an identified site located on the Remaining Extent of Portion 6 of the Farm Brabant No. 205, Registration Division Bloemfontein, within the Free State Province situated within the Mangaung Metropolitan Municipality area of jurisdiction.

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

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

This is the draft EIA Report that has been made available for a 30-day review and comment period to all interested and/or affected parties (I&APs) to provide opportunity to raise comment and potential issues regarding the proposed development. The 30-day period is from **Tuesday, 26 September 2023 to Thursday, 26 October 2023.**

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

- **Section 1: Introduction** - provides background to the development and the Scoping & EIA (S&EIA) process.
- **Section 2: Project and Development Footprint Description** - provides a description of all project related details, including alternatives and the process followed by the Applicant for site selection and layout design.

- **Section 3: Policy and Legislative Context** – provides a description of the policy and legislative context considering the proposed development, and also provides an indication of how the development responds to these aspects.
- **Section 4: Need and Desirability** - describes the need and desirability of the proposed development within the site and for the broader area.
- **Section 5: Approach to the Process** - outlines the approach followed in terms of the S&EIA Process.
- **Section 6: Public Participation Process** – outlines the approach followed in terms of the Public Participation Process.
- **Section 7: Description of the Affected Environment** - describes the current environment within which the development is proposed, including biophysical and socio-economic aspects.
- **Section 8: Impact Assessment** - provides an assessment of the potential impacts associated with the development and provides recommendations for the mitigation of significant impacts.
- **Section 9: Cumulative Impact Assessment** - provides an assessment of the potential cumulative impacts associated with the development and other developments and provides recommendations for the mitigation of significant impacts, where relevant.
- **Section 10: Development Footprint and Alternatives Analysis** – provides an analysis of the proposed development footprint considering the confirmed environmental sensitivities present and recommends the preferred development footprint put forward for EA. Furthermore, an analysis is provided of the alternatives proposed and assessed as well as a recommendation of the preferred alternatives.
- **Section 11: Conclusion** - presents the conclusions and recommendations based on the findings of the draft EIA Report.

# EXECUTIVE SUMMARY

Acrux Solar PV Project One (Pty) Ltd intends to develop a 200 MWac photovoltaic (PV) solar facility and associated infrastructure on Remaining extent of Portion 6 of the Farm Brabant No. 205. The city of Bloemfontein is located approximately 17 km east of the proposed development.

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

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

Following the completion of the Scoping Phase, and the Acceptance of the Scoping Phase and Plan of Study for the EIA (dated 14 August 2023 and included as Appendix H1) by the DFFE, the Applicant has undertaken the design of the development footprint considering the results of the confirmed environmental sensitivities that need to be avoided and considered. The development footprint has been put forward for assessment as part of this draft EIA Report to test how appropriate the facility layout is from an environmental perspective, when placed within the development area.

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

Impacts during the construction phase:

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

Impacts during the operational phase:

During the operational phase the site will serve as a solar PV facility and the potential impacts will take place over a period of 20 – 25 years. The negative impacts are generally associated with habitat destruction caused by clearance of vegetation, displacement of priority avian species from important habitats, collision and electrocutions of avifauna and visual impact of sensitive visual receptors occurring for motorists that drive past the proposed PV 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.

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.

Cumulative impacts:

Further to the above, cumulative impacts could arise as other similar projects are constructed in the area. Acrux Solar PV Project One is proposed in an area which has historically been used for agricultural activities with the site being specifically used for natural grazing at present and has historically been used for crop production. The Bloemfontein area and its surrounds (within which Acrux Solar PV Project One is proposed) receives a suitable annual amount of solar radiation which is considered appropriate for the development of solar energy facilities. It can therefore be expected that the area will be developed for solar energy facilities, adding to the cumulative impact of the overall area.

According to the Department of Forestry, Fisheries and Environment (DFFE) database, 12 similar developments have been proposed in close proximity (within 30km) to the proposed activity.

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

# 1 INTRODUCTION

Acrux Solar PV Project One (Pty) Ltd intends to develop a 200 MWac photovoltaic solar energy facility and associated infrastructure (including a overhead power line connection into existing Eskom infrastructure) to enable the generation of electricity from the solar resource as well as the evacuation of the generated power into the national grid. Energy generated by the facility will be evacuated into the national grid via a 132 kV overhead power line connecting to the existing Eskom Harvard Substation located approximately 8 km east of the development. The town of Bloemfontein is located approximately 17 km east of the proposed development (refer to Figure A and B for the locality and regional maps which are attached as separate documents to the report).

A development area[1] / site of up to 428 hectares was identified and assessed as part of the Scoping Phase of the Environmental Impact Assessment (EIA) process, which was fully considered as part of the Scoping Report. Following confirmation during the Scoping Phase of the appropriateness of the development area to house a solar PV development footprint, the Applicant has designed and put forward a development footprint / facility layout of 320 ha. The full extent of this proposed development footprint, and associated alternatives, are fully considered and assessed within this draft EIA Report, as well as the respective independent specialist studies (Appendix E).

The project further entails an overhead power line connection between the on-site facility substation and switching station and the existing Eskom Harvard Main Transmission Substation (MTS).

The development area has been confirmed as being highly desirable due to its suitable climatic conditions, topography (i.e., in terms of slope), environmental conditions (i.e., low agricultural potential, ecological sensitivity and archaeology), proximity to existing Eskom

[1] The development area is defined as the area within the affected property under assessment for the placement of the development footprint which will house all infrastructure associated with the development. The development area was fully assessed during the Scoping Phase. The development footprint will be defined and refined within this draft EIA Report for decision-making.

grid connection infrastructure, and proximity to the existing access off of the N8 National Road (i.e., to facilitate the movement of machinery, equipment, infrastructure and people during the construction phase).

## 1.1 Project Overview

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

- PV Panel Array, including mounting structures, to enable the generation of up to 200 MWac of electricity.
- Inverters and transformers.
- Battery Energy Storage System (BESS) / facilities required for the storage of generated electricity.
- Site and internal access roads (between 8 m and 12 m wide). Roads are required to access the site, as well as internally to access the various project components.
- Grid connection infrastructure including:
    - 33 kV cabling between the project components and the facility substations;
    - Two facility substations up to 132 kV (one located on either side of the road);
    - A 132 kV single/double circuit overhead power line linking the two facility substations; and
    - A collector switching station up to 132kV;
    - A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Harvard Transmission Substation
- Supporting infrastructure is required in the form of auxiliary buildings (including basic services such as water and electricity). These include an operations and 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.
- Temporary concrete batching plant for construction purposes.
- For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farms.

The proposed project is intended to form part of the Department of Mineral Resources and Energy's (DMREs) Renewable Energy Independent Power Producer Procurement (REIPPP) Programme or any other programmes/opportunities to generate power in South Africa. The

REIPPP Programme has a dual objective: to secure 14,725 Megawatts (MW) of new generation capacity from renewable energy sources and to diversify South Africa's electricity portfolio. In alignment with the Integrated Resource Plan 2019 and international commitments made under the United Nations Framework Convention on Climate Change and its Paris Agreement, as outlined in the 2021 State of the Nation Address, the government was set to initiate the procurement of an additional 11,800 MW of power. This power would be sourced from renewable energy, natural gas, battery storage, and coal.

Furthermore, Eskom, the largest greenhouse gas emitter in South Africa, has expressed a commitment in principle to achieve net-zero emissions by 2050, along with a substantial increase in its renewable energy capacity. This collective effort underscores South Africa's dedication to reducing greenhouse gas emissions and embracing sustainable energy sources.

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 One (Pty) Ltd is proposing the development of the proposed photovoltaic solar energy facility and associated infrastructure (including grid connection infrastructure) for the purpose of commercial electricity generation.

## 1.2 Requirement for the Environmental Impact Assessment Process

The construction and operation of the Acrux Solar PV Project One 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 facility will have a capacity of up to 200 MWac. Table 1.1 below indicates all listed activities triggered in terms of the EIA Regulations and provides a project description in terms of the activity trigger.

**Table 1.1:** Listed Activities Applied for.

| Relevant notice: | Activity No (s) | Description of each listed activity as per project description: |
|---|---|---|
| GN.R. 327 (as amended) | Activity 11(i) | • *"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".*<br><br>• Activity 11(i) is triggered as the project entails the development of:<br>o 33 kV cabling between the project components and the facility substations;<br>o Two facility substations up to 132 kV (one located on either side of the road); |

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

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|---|---|---|
| | | o A 132 kV single/double circuit overhead power line linking the two facility substations; and<br>o A collector switching station up to 132kV;<br>o A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Harvard Transmission Substation |
| GN.R. 327 (as amended) | 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."*<br>• Activity 12(ii)(c) is triggered as the site includes two wetlands, one being a seepage wetland and one a depression wetland. The development footprint is located within 32 m of the wetlands, but not within 16 m as per the recommendations of the wetland specialist. The total development footprint of the Acrux Solar PV Project One will be 320 ha. |
| GN.R. 327 (as amended) | 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."*<br>• Activity 14 is triggered as the use of hazardous substances will form part of the construction phase. The substances anticipated to be used include cement powder associated with the concrete/brick works; petrol/diesel for trucks, cranes, bulldozers etc.; limited amounts of transformer oils. The dangerous goods will be stored during construction and operations in a covered area/bin or kept within a bunded area in line with best practice guidelines and disposed of at registered hazardous waste sites. The storage |

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| | | requirements will be more than 80 cubic metres but are not expected to exceed 500 cubic metres. |
| GN.R. 327 (as amended) | Activity 24(ii) | • *"The development of a road (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters".*<br><br>• Activity 24(ii) is triggered as the proposed access roads associated with Acrux Solar PV Project One will be between 8 m and 12 m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold / trigger of this activity. |
| GN.R. 327 (as amended) | 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".*<br><br>• Activity 28(ii) is triggered as the total area to be developed for the PV facility and associated infrastructure is greater than 1 ha and occurs outside an urban area in an area currently zoned for agriculture. The property will be re-zoned to "special" use. The identified development area is up to 428 ha and will house a development footprint of up to 320 ha. |
| GN.R. 327 (as amended) | 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…"*<br><br>• Activity 56(ii) is triggered as existing roads will require widening of up to 8 m and/or lengthening by more than 1 km, to accommodate the movement of heavy vehicles and cable trenching activities. |

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| GN.R. 325 (as amended) | 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".*<br><br>• Activity 1 is triggered since the proposed solar photovoltaic facility will generate up to 200 megawatts alternating current of electricity through the use of a renewable resource. |
| GN.R. 325 (as amended) | Activity 15 | • *"The clearance of an area of 20 hectares or more of indigenous vegetation."*<br><br>• Activity 15 is triggered as the cumulative area of indigenous vegetation to be cleared for the entire Project (excluding linear components) will exceed 20 hectares. The identified development area is up to 428 ha and will house a development footprint of up to 320 ha. |
| GN.R. 324 (as amended) | Activity 4 (b)(i)(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, in (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."*<br><br>• Activity 4(b)(i)(gg) is triggered as the proposed access roads associated with Acrux Solar PV Project One will be between 8 m and 12 m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold / trigger of this activity.<br><br>The Acrux Solar PV Project One is located within the Free State Province, outside of urban areas. The site is located directly adjacent to the Highlands Nature Reserve (located directly west) and 5.7 km from the |

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| | | Olievenkloof Private Nature Reserve (located south of the site). |
| GN.R. 324 (as amended | Activity 12 (b)(i)(iv) | • *"The clearance of an area of 300 square metres or more of indigenous vegetation (b) Free State (i) within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004 (iv) Areas within a watercourse or wetland; or within 100 metres from the edge of a watercourse or wetland".*<br>• Activity 12 (b)(i)(iv) is triggered since the project is located within the Free State Province and will require the removal of 320 ha of indigenous vegetation. A section of the development footprint falls within the endangered Bloemfontein Dry Grassland. Furthermore, the site includes two wetlands, one being a seepage wetland and one a depression wetland. The development footprint is located within 32 m of the wetlands, but not within 16 m as per the recommendations of the wetland specialist. |
| GN.R. 324 (as amended) | Activity 14 (ii)(c)(b)(i)(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, within the (b) Free State, (i) Outside urban areas, in (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."*<br>• Activity 14(ii)(c)(b)(i)(hh) is triggered as the site includes two wetlands, one being a seepage wetland and one a depression wetland. The development footprint is located within 32 m of the wetlands, but not within 16 |

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|---|---|---|
| | | m as per the recommendations of the wetland specialist. The total development footprint of the Acrux Solar PV Project will be 320 ha.<br><br>The Acrux Solar PV Project One is located within the Free State Province, outside of urban areas. The site is located directly adjacent to the Highlands Nature Reserve (located directly west) and 5.7 km from the Olievenkloof Private Nature Reserve (located south of the site). |
| GN.R. 324 (as amended) | Activity 18 (b)(i)(gg)(hh) | • *"The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre, within the (b) Free State (i) Outside urban areas, in (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."*<br><br>• Activity 18(b)(i)(gg)(hh) is triggered as existing roads will require widening of up to 8 m and/or lengthening by more than 1 km, to accommodate the movement of heavy vehicles and cable trenching activities.<br><br>The Acrux Solar PV Project One is located within the Free State Province, outside of urban areas. The site is located directly adjacent to the Highlands Nature Reserve (located directly west) and 5.7 km from the Olievenkloof Private Nature Reserve (located south of the site). The site includes two wetlands, one being a seepage wetland and one a depression wetland. The development footprint is located within 32 m of the wetlands, but not within 16 m as per the recommendations of the wetland specialist. The total |

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| | | development footprint of the Acrux Solar PV Project will be 320 ha. |

Appendix 3 of the EIA Regulations, 2014 (as amended), contains the objectives to be achieved through the undertaking of an environmental impact assessment process. The following objectives have been considered, undertaken and achieved through a consultative process within this draft EIA Report for the Acrux Solar PV Project One:

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

## 1.3 Details of the Environmental Assessment Practitioner and Independent Specialists

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

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

The details of the Registered EAP are as follows:

**Table 1.2:** Details of the Registered EAP.

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

Regulation 13(1)(a) and (b) determines that independent and suitably qualified, experienced and independent specialists should conduct the specialist studies, in the event where the specialist is not independent, a specialist should be appointed to externally review the work of the specialist as contemplated in sub regulation (2). In terms of the independent status of

the specialists, their declarations are attached as Appendix E9 to this report. The expertise of the specialists is summarised in their respective reports.

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

Table 1.3: Details of the Independent Specialists.

| Study | Prepared by | Contact Person | Tel | E-mail |
|---|---|---|---|---|
| Terrestrial Ecology Baseline and Impact Assessment | The Biodiversity Company | Carami Burger and Andrew Husted | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Wetland Baseline and Risk Assessment | The Biodiversity Company | Namitha Singh and Andrew Husted | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Avifaunal Impact Assessment | The Biodiversity Company | Ryno Kemp and Andrew Husted | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Soil and Agricultural Compliance Statement | The Biodiversity Company | Maletsatsi Mohapi and Andrew Husted | Cell: 081 319 1225 | info@thebiodiversitycompany.com |
| Visual Impact Assessment | Donaway Environmental | Johan Botha | Cell: 082 316 7749 | johan@donaway.co.za |
| Social Impact Assessment | Donaway Environmental | Johan Botha | Cell: 082 316 7749 | johan@donaway.co.za |
| Heritage Impact Assessment | J van Schalkwyk Heritage Consultant | J van Schalkwyk | Cell: 076 790 6777 | jvschalkwyk@mweb.co.za |
| Palaeontological Desktop Assessment | Banzai Environmental | Elize Butler | Cell: 084 447 8759 | elizebutler002@gmail.com |

## 1.4 Assumptions and Limitations

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

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

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

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

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(a) the details of the (i) EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae. | The details of the EAP who prepared the report and the expertise of the EAP is included in section 1.3. The curriculum vitae of the EAP is included in Appendix A. |
| 3(1)(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered. | All listed activities triggered by the development are included in Table 1.1 of section 1.2. |
| 3(1)(p) a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed. | A description of the assumptions, uncertainties and gaps in knowledge are included in section 1.4 and the respective specialist studies included in Appendix E. |
| 3(1)(s) an undertaking under oath or affirmation by the EAP in relation to (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties. | The Declaration of the EAP and undertaking under oath is included in Appendix A as per the most recent DFFE template. |

# 2 PROJECT AND DEVELOPMENT FOOTPRINT DESCRIPTION

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

## 2.1 Location of the Proposed Development Footprint

A development area of 428 ha identified within the affected property was assessed fully assessed during the Scoping Phase for the placement of the development footprint which will ultimately house the Acrux Solar PV Project One and associated infrastructure. A 200 m wide and 8 km long grid connection corridor will be assessed for placement of the grid connection infrastructure, specifically for the overhead power line to the Harvard Main Transmission Substation. The DFFE approved the Scoping Report on 14 August 2023 and thereby essentially approved the undertaking of the assessment of placement of a development footprint within the development area based on the opportunities it presents to put forward an environmentally appropriate facility layout.

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

**Table 2.1:** General Site and Location Information.

| | |
|---|---|
| Description of affected farm portions | Solar PV Facility:<br>• Remaining extent of Portion 6 of the Farm Brabant No. 205<br>Grid Connection Corridor:<br>• Remaining Extent of Portion 6 of Farm Brabant No. 205<br>• Portion 2 of Farm Brabant No. 205 |

| | |
|---|---|
| | • Portion 1 of Farm Brabant No. 205<br>• Portion 1 of Farm Spes Bona No. 2355<br>• Portion 13 of Farm Spes Bona No. 2355<br>• Portion 14 of Farm Spes Bona No. 2355<br>• Portion 10 of Farm Spes Bona No. 2355<br>• Remaining Extent of Portion 6 of Farm Spes Bona No. 2355<br>• Portion 7 of Farm Spes Bona No. 2355<br>• Portion 11 of Farm Spes Bona No. 2355<br>• Remainder of Farm Spes Bona No. 2355<br>• Remainder of Farm Kwaggafontein No. 23000<br><br><u>Access Road (existing road to possibly be widened):</u><br><br>• Remaining extent of Portion 6 of the Farm Brabant No. 205 |
| Province | Free State |
| Municipality | Mangaung Metropolitan Municipality |
| Ward numbers | 48 |
| Closest towns | The city of Bloemfontein is located approximately 17 km east of the proposed development |
| 21 Digit Surveyor General codes | <u>Solar PV Facility:</u><br><br>• Remaining Extent of Portion 6 of Farm Brabant No. 205<br>F00300000000020500006<br><br><u>Grid Connection Corridor:</u><br><br>• Remaining Extent of Portion 6 of Farm Brabant No. 205<br>F00300000000020500006<br>• Portion 2 of Farm Brabant No. 205<br>F00300000000020500002<br>• Portion 1 of Farm Brabant No. 205<br>F00300000000020500001 |

| | |
|---|---|
| | • Portion 1 of Farm Spes Bona No. 2355 F00300000000235500001<br>• Portion 13 of Farm Spes Bona No. 2355 F00300000000235500013<br>• Portion 14 of Farm Spes Bona No. 2355 F00300000000235500014<br>• Portion 10 of Farm Spes Bona No. 2355 F00300000000235500010<br>• Remaining Extent of Portion 6 of Farm Spes Bona No. 2355 F00300000000235500006<br>• Portion 7 of Farm Spes Bona No. 2355 F00300000000235500007<br>• Portion 11 of Farm Spes Bona No. 2355 F00300000000235500011<br>• Remainder of Farm Spes Bona No. 2355 F00300000000230000000<br>• Remainder of Farm Kwaggafontein No. 23000 F00300000002300000000<br><br><u>Access Road:</u><br><br>• Remaining Extent of Portion 6 of Farm Brabant No. 205 F00300000000020500006 |
| Area under assessment (development area assessed and approved in the Scoping Phase) | 428 ha |
| Development footprint (footprint associated with the draft facility layout) | 320 ha |
| Photographs of the site | Included in the Plates as an appendix to the Report |

Following the completion of the Scoping Phase the Applicant set out in designing a draft layout / development footprint within the fully assessed development area which considers

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

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

The area surrounding Acrux Solar PV Project One is characterised mostly by agricultural development except to the east where large scale urban development is present, which is the city of Bloemfontein. The development is located adjacent to the proclaimed Highlands Nature Reserve, but after further investigation, the Visual Impact Assessment (Appendix E5) 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 the assessment / development area within which the development footprint is proposed to be located.

## 2.2 Details of the Infrastructure Proposed

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

The infrastructure to be developed is specifically related to the preferred technology to be installed to generate electricity from the solar resource, which in this case is photovoltaic. Photovoltaic solar energy is obtained by converting sunlight into electricity using a technology based on the photoelectric 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.

The design of the detailed layout / development footprint has been an iterative process between the Applicant, the relevant independent specialists and the EAP to provide guidance and understanding to the Applicant in the designing process to adhere to the

[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.

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

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

Table 2.2: Technical Details of the proposed infrastructure for the Acrux Solar PV Project One.

| Component | Description / dimension |
|---|---|
| Type of technology | Photovoltaic solar facility |
| Generation capacity | Up to 200 MWac |
| Area of the PV Array | Up to 310 ha. Within the development footprint the PV Array have been designed into two separate sections which make up the entire facility as the development footprint is bisected by an unnamed road. |
| 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.<br><br>PV panels with single axis tracking are preferred over fixed-axis or double axis tracking systems due to the potential to achieve higher annual energy yields whilst minimising the balance of system (BOS) costs, resulting in the lowest levelized cost of energy (LCOE). The development of the PV facility will take into consideration during the final design phase the use of |

| | |
|---|---|
| | either tracker vs fixed-tilt mounting structures. Both options are considered feasible for the site. |
| Structure Height | • Panels up to 6 m<br>• Buildings up to 12 m<br>• Power line up to 30 m<br>• Fencing up to 3 m |
| Area of the Battery Storage | Within a 1 ha area of the development footprint or spread out within the facility next to the inverters and in between the panel arrays (which is referred to as BESS Local).<br><br>Therefore, the BESS will either be located within one designated BESS area or spread out within the facility. |
| Capacity of the Battery Storage | Unspecified. To be confirmed prior to construction. |
| Area of the facility substations and switching substation | • Two facility substations: up to 1 ha each<br>• Eskom Switching Station: up to 1 ha |
| Capacity of the facility substations and switching station | • Two facility substations: up to 132 kV each<br>• Eskom Switching Station: up to 132 kV each |
| Internal power line capacity between the two facility substations within the development footprint | 132 kV single/double circuit overhead power line |
| Internal power line length between the two facility substations | Up to 150 m |
| Grid Connection to the national grid | A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Harvard Transmission Substation. |

| | |
|---|---|
| | A grid connection corridor is under assessment which can cater for the placement of the power line. The corridor is 8 km long and 200 m wide. The final grid route within the corridor will be based on feedback provided by the Eskom Grid Access Unit as the process advances, as well as the consideration of sensitive environmental features present within the corridor. |
| Capacity of the power line | Single or double circuit line with a capacity of 132 kV |
| Power line servitude width | Up to 32 m |
| Laydown area dimensions | Temporary laydown areas will occupy up to 2 hectares while 1 hectare will remain in place for the permanent laydown area as required for facility operation.<br><br>The areas utilised for the temporary laydown areas might be covered with PV panels. |
| Area occupied by buildings | Operations and Maintenance Building/Office; switchgear and relay room; staff lockers and changing room; security control; and offices: Up to 1 ha |
| Width of internal roads | Up to 12 m wide ( between 8 m and 12 m wide, but with the inclusion of side drains and gavel embankments, will exceed the threshold / trigger of this activity) |
| Length of internal roads | Up to 40 km in total |

A draft development footprint providing details of the facility layout and associated infrastructure has been provided by the Applicant for assessment as part of the EIA Phase. The draft layout shows the development footprint of 320 ha with an indication of the placement of the PV Panel Array, grid infrastructure, roads and auxiliary infrastructure such as substations, buildings, BESS and laydown areas. Refer to Figure 2.1 below, as well as the appended Figures H1a and H1b.

This draft development footprint / layout will be optimised throughout the EIA Phase (where required) to enable the consideration and avoidance of all sensitive environmental features

and areas present within the development area and thereby provide an opportunity to holistically consider all sensitivities and design an environmentally appropriate development footprint / facility layout to be put forward for the decision on the Application for Environmental Authorisation.

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

**Table 2.3:** Coordinates associated with the proposed Acrux Solar PV Project One.

| Coordinates | | | |
|---|---|---|---|
| Development Footprint (320 ha) | A | 29° 5'56.66"S | 26° 2'18.10"E |
| | B | 29° 5'54.32"S | 26° 2'9.67"E |
| | C | 29° 6'2.43"S | 26° 1'47.91"E |
| | D | 29° 5'55.84"S | 26° 1'23.56"E |
| | E | 29° 5'52.89"S | 26° 1'23.52"E |
| | F | 29° 5'49.26"S | 26° 1'21.32"E |
| | G | 29° 5'44.73"S | 26° 1'20.60"E |
| | H | 29° 4'55.56"S | 26° 1'40.75"E |
| | I | 29° 5'12.06"S | 26° 2'29.73"E |
| | J | 29° 5'3.80"S | 26° 2'39.28"E |
| | K | 29° 6'5.18"S | 26° 2'59.54"E |
| | L | 29° 6'5.63"S | 26° 2'58.12"E |
| | M | 29° 5'52.18"S | 26° 2'42.77"E |
| | N | 29° 5'34.14"S | 26° 2'37.22"E |
| | O | 29° 5'29.65"S | 26° 2'18.53"E |
| | P | 29° 5'35.91"S | 26° 2'16.93"E |
| Development Area (428 ha) | A | 29° 6'8.57"S | 26° 3'0.48"E |
| | B | 29° 6'4.66"S | 26° 2'29.38"E |
| | C | 29° 6'10.17"S | 26° 2'14.97"E |
| | D | 29° 5'54.49"S | 26° 1'15.70"E |
| | E | 29° 4'55.22"S | 26° 1'40.22"E |
| | F | 29° 5'11.81"S | 26° 2'29.86"E |
| | G | 29° 5'3.39"S | 26° 2'39.44"E |
| On-site Facility Substation 1 | A | 29° 5'30.18"S | 26° 2'38.22"E |
| | B | 29° 5'30.18"S | 26° 2'39.54"E |

| | | | |
|---|---|---|---|
| | C | 29° 5'31.71"S | 26° 2'39.55"E |
| | D | 29° 5'31.70"S | 26° 2'38.22"E |
| On-site Facility Substation 2 & Eskom Collector Switching Substation | A | 29° 5'28.65"S | 26° 2'26.90"E |
| | B | 29° 5'28.68"S | 26° 2'32.90"E |
| | C | 29° 5'32.10"S | 26° 2'32.91"E |
| | D | 29° 5'32.10"S | 26° 2'30.46"E |
| | E | 29° 5'31.34"S | 26° 2'30.45"E |
| | F | 29° 5'31.34"S | 26° 2'26.89"E |
| BESS (one designated area option) | A | 29° 5'28.64"S | 26° 2'21.89"E |
| | B | 29° 5'28.66"S | 26° 2'26.33"E |
| | C | 29° 5'30.16"S | 26° 2'26.34"E |
| | D | 29° 5'30.16"S | 26° 2'21.88"E |
| Internal power line between the two facility substations within the development footprint | | | |
| Start | A | 29° 5'30.93"S | 26° 2'38.24"E |
| Middle | B | 29° 5'30.86"S | 26° 2'35.67"E |
| End | C | 29° 5'30.78"S | 26° 2'32.91"E |
| Grid Connection Corridor (200m wide and 8 km long) | | | |
| Start | A | 29° 5'33.06"S | 26° 2'33.80"E |
| Bend point | B | 29° 6'21.42"S | 26° 3'20.64"E |
| Middle | C | 29° 6'17.93"S | 26° 4'41.94"E |
| Bend Point | D | 29° 6'41.15"S | 26° 4'52.20"E |
| Last Bend | E | 29° 6'32.62"S | 26° 6'21.56"E |
| End | F | 29° 6'18.58"S | 26° 6'19.69"E |

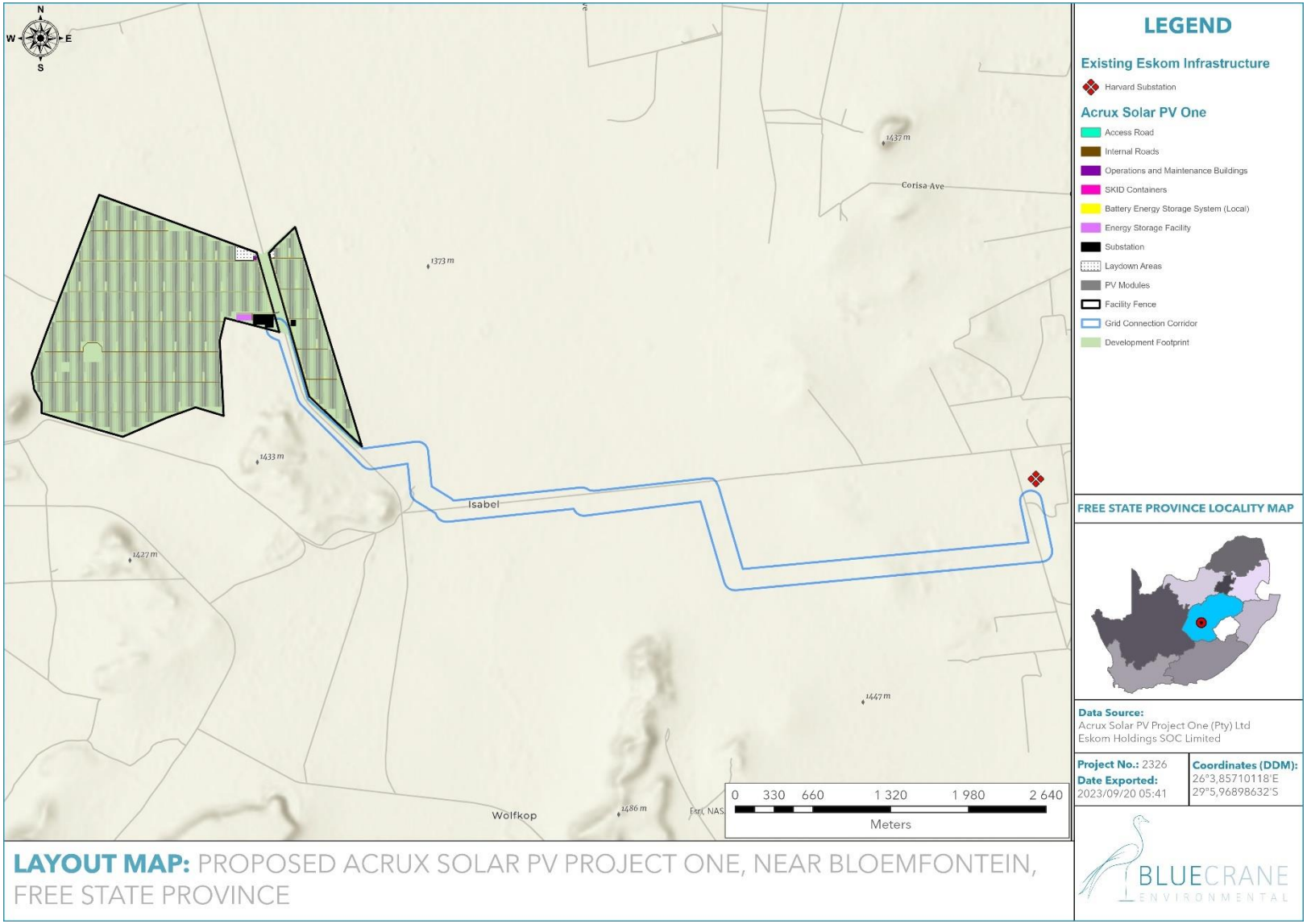


**Figure 2.1:** Draft Layout Plan / Development Footprint for the Acrux Solar PV Project One assessed as part of this draft EIA Report.

## 2.3 Development Footprint Identification and Selection Process

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

The process undertaken by the Applicant for the identification of the preferred site / development area was through an investigation of prospective sites and properties in the 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, which were sourced from the draft Scoping Report compiled by Environamics Environmental Consultants (June 2023). The Applicant considered that should these characteristics not be favourable for the development of a solar facility, then some limitations and challenges may be expected for the development. Characteristics considered includes:

*Climatic Conditions* – Climatic conditions determine if the project will be viable from an economic perspective as the Solar PV facility is directly dependent on the annual direct solar irradiation values of a particular area. The Free State Province receives high averages of direct normal and global horizontal irradiation daily. This is an indication that the regional location of the project includes a low number of rainy days and a high number of daylight hours experienced in the region. The Global Horizontal Radiation value relevant to the area is 2118 kWh/m$^2$ per annum. See Figure 2.2.

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

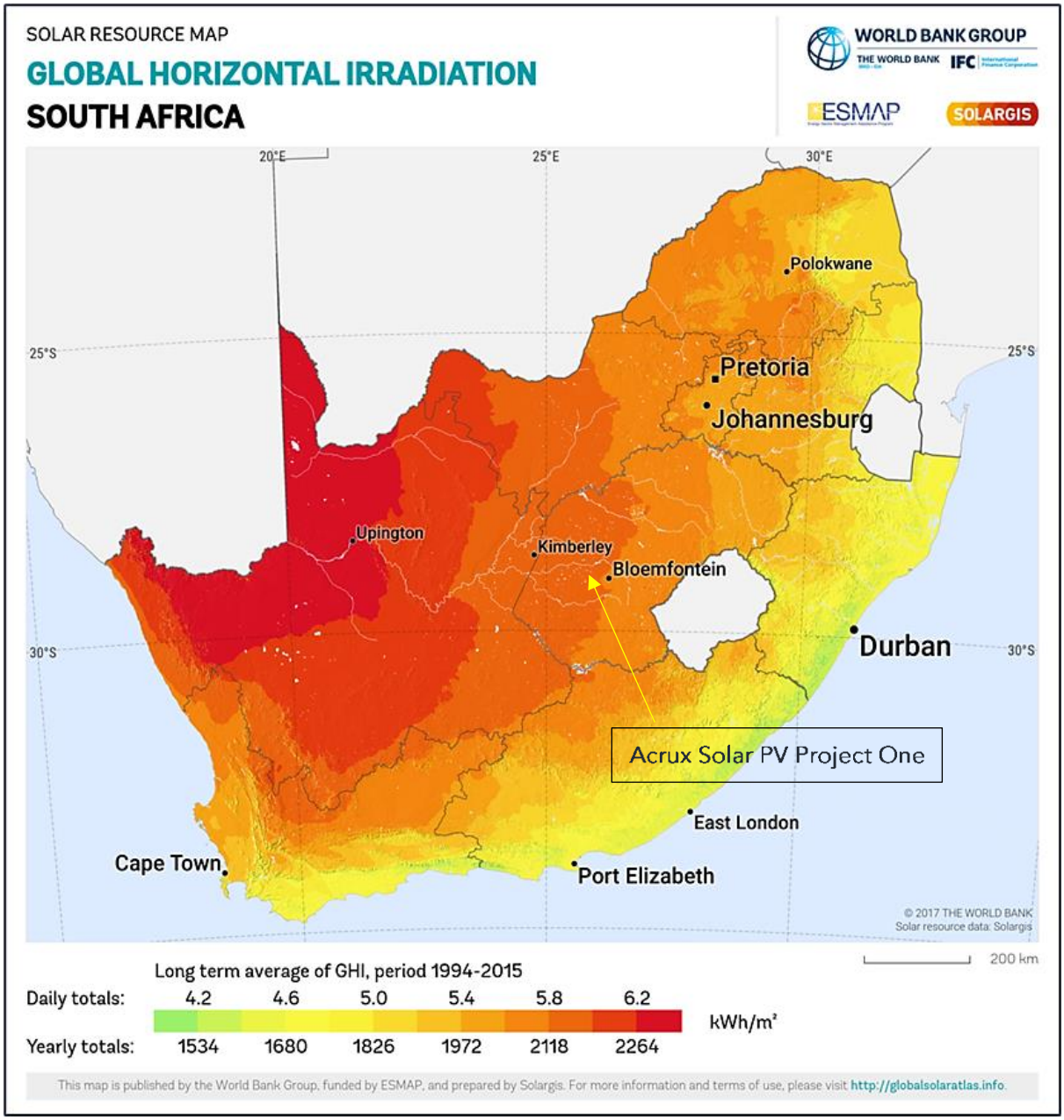


Figure 2.2: Global Horizontal Irradiation Values for South Africa (Solar GIS, 2021) and the Acrux Solar PV Project One development area.

*Extent of the site* - A significant portion of land is required to evacuate up to 200 MWac and space is a constraining factor in PV facility installations. Provision was made to assess a larger area than is required for the facility to make provision for any other environmental or technical constraints that may arise and avoid those areas. Larger farms are sought after to make provision for any constraints imposed by the Department of Agriculture, Land Reform and Rural Development on the extent of land that may be used for such facilities per farm, as well as the opportunities presented for the avoidance of sensitive environmental features present. The Remaining extent of Portion 6 of the Farm Brabant No. 205, and the development area

assessed therein is considered to provide an opportunity for the successful construction and operation of a solar PV facility with a capacity of up to 200 MWac, as well as opportunities for the avoidance and mitigation of impacts on the affected environment and sensitive environmental features.

*Site availability and access* - The land is available for lease by the developer. Reluctant farm owners or farmers over capitalizing, hamper efforts to find suitable farms. Access to the site is most likely to be obtained via the N8 national road and existing farm roads in the surrounding area.

*Grid connection* - In order for the PV facility to connect to the national grid two on-site facility substations, an Eskom switching station and an overhead power line from the site to the connection point in the national grid is required to be developed. Available grid connection points and capacity are becoming scarce and plays a significant role when selecting a viable site for the development of a renewable energy project. The proposed Acrux Solar PV Project One overhead power line route will connect directly into the existing Harvard Main Transmission Substation. A 200 m wide and 8 km long grid connection corridor has been assessed for the placement of the overhead power line.

*Environmental Sensitivities* – From an environmental perspective the proposed site is considered highly desirable in terms of vegetation and landscape features, climate, biodiversity and the visual landscape despite the presence of the environmental sensitivities identified. . The area proposed for development exclusively consists of land used for agriculture, with wetland features present, as well as crop fields on or in close proximity to the site and a historic homestead. These environmental sensitive have been considered and avoided by the Applicant for the placement of the facility infrastructure within the development area.

The Scoping Report concluded that the Remaining Extent of Portion 6 of the Farm Brabant No. 205, may be considered favourable and suitable in terms of the site and environmental characteristics. No alternative areas on the affected property have been considered for the placement of the development footprint as the assessed development footprint will aim to avoid areas that are of high environmental sensitivity within the affected property. The development footprint of this project will cover a significant portion of the farm; however, provision will be made to exclude any sensitive areas from the facility layout to be developed within the development footprint.

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

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

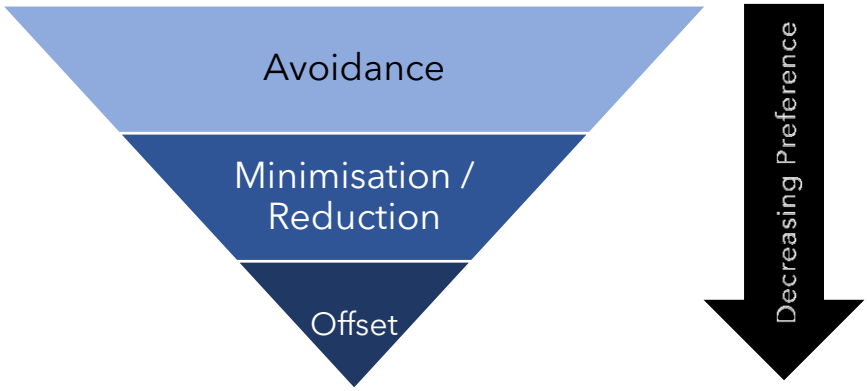


**Figure 2.3:** Typical mitigation hierarchy.

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

## 2.4 Alternatives Under Assessment considering the Development Footprint

This section describes the alternatives under consideration for the Acrux Solar PV Project One EIA Phase. In terms of the Regulations only 'feasible' and 'reasonable' alternatives should be

considered for development. The process undertaken by the Applicant for the identification of alternatives has been an iterative process and will continue to be an iterative process between the EAP and the Applicant in order to ensure that the preferred alternative proposed for authorisation is ultimately appropriate from a technical feasibility perspective as well as an environment perspective. Refer to Table 2.4 for an overview of the alternatives being considered.

**Table 2.4:** Summary of the Alternatives Considered.

| Alternatives considered | Description of the Alternative relating to the development |
|---|---|
| Site specific and Layout Alternatives | One preferred site / development area has been identified for the development of the Acrux Solar PV Project One based on specific site characteristics such as the solar resource, land availability, topographical characteristics and environmental features. The development area of 428 ha is considered to be sufficient for the development of a solar facility with a contracted capacity of up to 200 MWac and has been approved for assessment of the placement of a development footprint as part of the Scoping Phase.<br><br>The Applicant has provided a draft development footprint / facility layout for assessment by the specialists and as part of this draft EIA Report and will undertake an optimisation process of the footprint where it is found to be infringing into sensitive environmental features or areas not appropriate for disturbance or the placement of infrastructure. |
| Activity Alternatives | Only the development of a solar renewable energy facility is considered by Acrux Solar PV Project One (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). Therefore, no other activity alternatives are relevant or under consideration. |

| | |
|---|---|
| Technology Alternatives | Only the development of a photovoltaic solar facility is considered due to the characteristics of the site, including the natural resources available. Therefore, no other technology alternatives are relevant or under consideration. |
| Grid Connection Alternatives | Energy generated by the facility will be evacuated into the National Grid via a 132 kV overhead power line connection into the existing Eskom Harvard Main Transmission Substation.<br><br>A grid connection corridor is under assessment which can cater for the placement of the power line. The corridor is 8 km long and 200 m wide. The final grid route within the corridor will be based on feedback provided by the Eskom Grid Access Unit as the process advances, as well as the consideration of sensitive environmental features present within the corridor.<br><br>No other corridors are under consideration as the proposed corridor is preferred as it is the most technically feasible and shortest route to connection the Solar PV Project to the Harvard Main Transmission Substation. |
| BESS Location Alternatives | Within the proposed development footprint the Applicant has identified two (2) potential locations for the placement of the BESS. Both locations are feasible from a technical perspective. One option is the placement of the BESS within a designated and defined area within the development footprint. Another option under consideration is spreading out of the BESS infrastructure within the facility next to the inverters and in between the PV panel arrays.<br><br>The placement of the BESS within a designated and defined area is preferred from a technical perspective. |
| 'Do-nothing Alternative | The option to not construct the Acrux Solar PV Project One. No impacts (positive or negative) are expected to occur on the social and environmental sensitive features or aspects located within the development area and footprint as well as the surrounding |

| | |
|---|---|
| | areas of the site. The opportunities associated with the development of the solar facility for the 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 was undertaken by the Applicant for the identification of the development area, followed by the design of the development footprint within the development area. The development area is large in extent (428 ha) and therefore represents an opportunity to consider and avoid the sensitive environmental areas and features through the careful planning and placement of the development footprint which is of a smaller extent (320 ha).

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

1. The entire extent of the development area (428 ha) was fully assessed as part of the Scoping Phase and within the draft Scoping Report completed by Environamics Environmental Consultants.
2. The Applicant and Blue Crane Environmental have considered all final and confirmed environmental sensitivities for the site and through the use of spatial mapping considered the areas that need to be avoided and are not available for the placement of infrastructure. This guidance was utilised by the Applicant for the design and placement of infrastructure as part of the development footprint put forward for assessment as part of this draft EIA Report.
3. The Applicant has provided to Blue Crane Environmental a draft facility layout that is considered and assessed by the EAP and the independent specialists in this draft EIA Report. The layout is be made available to I&APs as part of the 30-day review and comment period of this draft EIA Report.
4. Should any further concerns be raised by the specialists or I&APs (including the competent and commenting authorities) regarding the layout (including potential infringement into sensitive environmental features / area) the Applicant will undertake an optimisation process to optimise the draft layout to ensure suitability.
5. The optimised layout will therefore then be put forward for authorisation and a motivation for the layout from a technical and environmental perspective will be provided by Blue

Crane Environmental. Therefore, no alternative development footprints are under assessment, the optimised layout will be considered as preferred and small tweaks will be undertaken as relevant to ensure environmental suitability.

Therefore, the draft facility layout provided as part of the EIA Phase provides an indication of the 320 ha development footprint of the PV facility and the preliminary location for the associated infrastructure prior to optimisation, should optimisation for further avoidance be relevant. Figure 2.4 provides an indication of the layout that was under assessment as part of the Scoping Phase and considered in the Scoping Report, which received approval from DFFE. Figure 2.5 provides an indication of the detailed draft facility layout under assessment as part of the EIA Phase that is considered within this draft EIA Report.

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

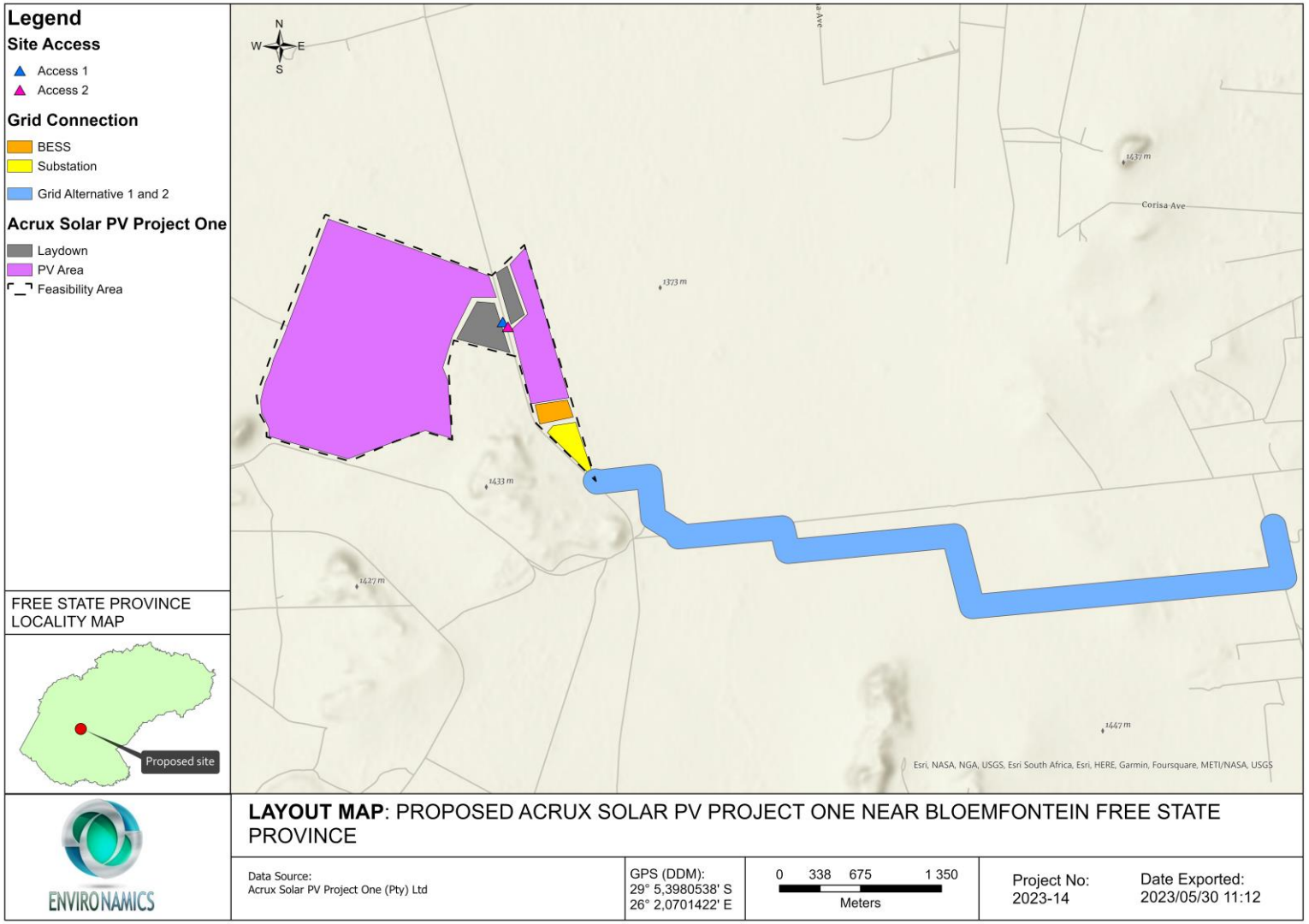


Figure 2.4: Acrux Solar PV Project One layout assessed as part of the Scoping Phase (Source: Environamics Environmental Consultants, June 2023).

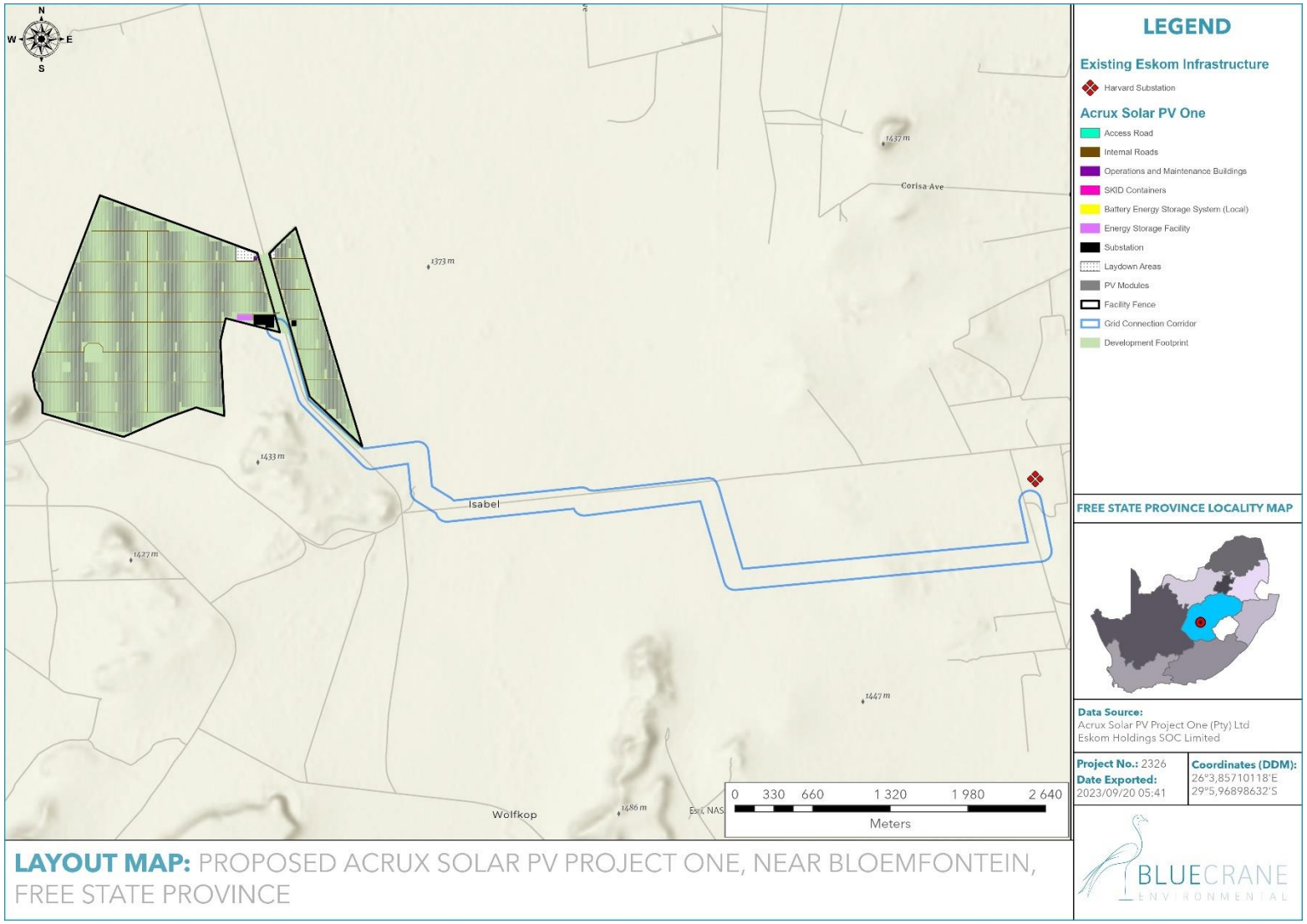


Figure 2.5: Acrux Solar PV Project One draft development footprint assessed as part of the EIA Phase providing detail of the infrastructure proposed (also see Figure H1a and H1b appended separately to the report).

### 2.4.2 Activity Alternatives

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

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

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

In terms of alternative renewable energy generation options available 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 country.

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

### 2.4.3 Technology Alternatives

As Acrux Solar PV Project One (Pty) Ltd is an Independent Power Producer, only renewable energy technologies are being considered for the generation of up to 200 MWac of electricity. Considering the local resources available (i.e., wind and solar irradiation) for such technologies, the footprint requirements for such developments and the current land use of the site (i.e., agriculture), 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 One, technology alternatives were considered in terms of the PV panels that may be installed as well as type of Battery Energy Storage System (BESS) and power line. These are discussed in the sections below.

#### Photovoltaic Panels

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

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

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

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

In terms of the preference of the PV panels for the Acrux Solar PV Project One 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)

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

Two BESS technology alternatives are under consideration for Acrux Solar PV Project One. 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 oxidation states to store chemical potential energy.

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

Acrux Solar PV Project One (Pty) Ltd is most likely to locate the BESS in a single dedicated area. Another option is to spread out the BESS infrastructure and locate it adjacent to the inverters within the PV panel array.

#### Power Line Pylon Structures

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

### 2.4.4 Grid Connection Alternatives

The Applicant has identified the existing Eskom Harvard Main Transmission Substation, located to the east of the site, as a feasible grid connection point into the national grid.

As such, the Applicant proposes the construction of a 132 kV overhead power line to enable the connection between the Eskom collector switching station and the existing Main Transmission Substation to enable the evacuation of the generated electricity into the national grid.

A 200 m wide grid connection corridor with a length of 8 km is under assessment for the placement of the overhead power line to evacuate the generated electricity to the national grid. Refer to Figure 2.6 below.

It must be noted that as part of the Scoping Phase the Applicant had provided two grid connection route alternatives to be assessed, however following consideration of the routes, both of which connect into the existing Harvard Main Transmission Substation, it was noted that both routes share a very similar alignment (refer to Figure 2.6). Based on the alignment similarities and the need to assess a wider corridor to enable the avoidance of sensitive environmental features, the Applicant provided one consolidated grid connection corridor for assessment as part of the EIA Phase. Refer to Figure 2.7.

No other corridors are under consideration as the proposed corridor is preferred as it is the most technically feasible and shortest route to connect the Solar PV Project to the Harvard Main Transmission Substation.

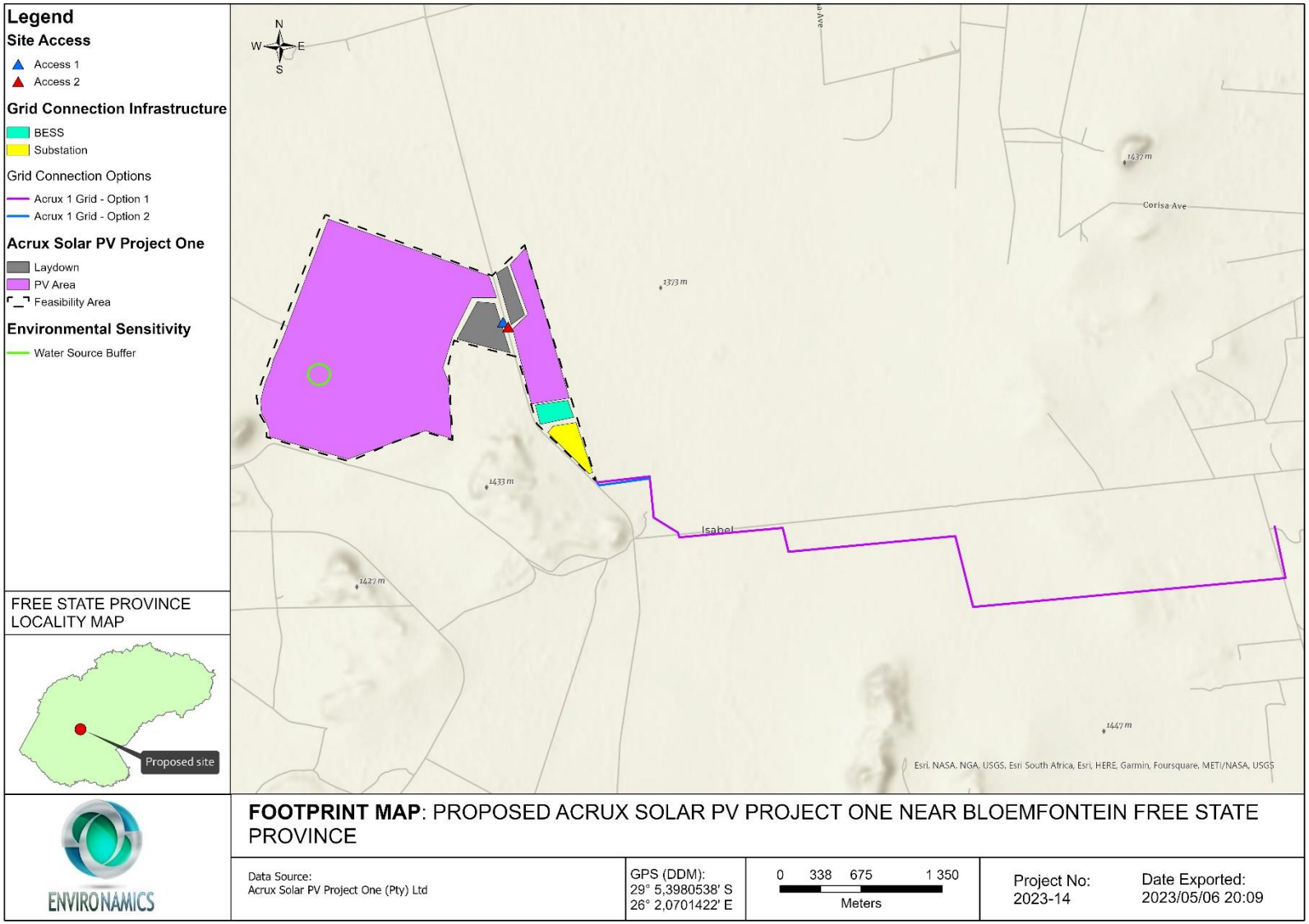


Figure 2.6: Acrux Solar PV Project One Connection Corridor alternatives assessed as part of the Scoping Phase (Environamics, 2023).

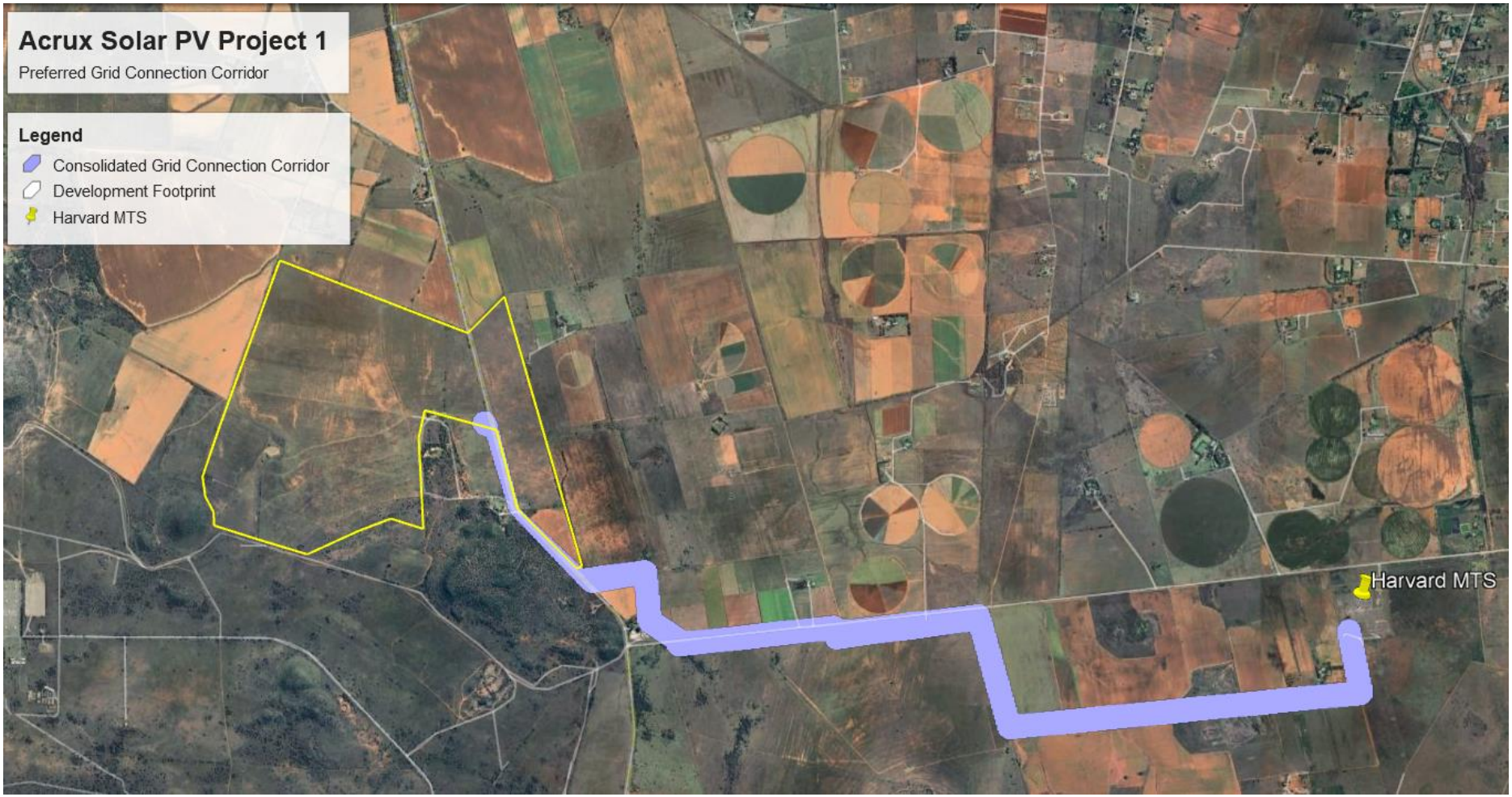


**Figure 2.7:** Acrux Solar PV Project One consolidated Connection Corridor assessed as part of the EIA Phase.

### 2.4.5 BESS Location Alternatives

Within the draft development footprint two location options are proposed for assessment for the placement of the Battery Energy Storage System. One of these is a central designated location within the development footprint where a large specified area is indicated – this option has been indicated to be the technically preferred option. The other option is the placement and distribution of the BESS infrastructure throughout the PV array and adjacent to the inverters. Refer to Figure 2.8.

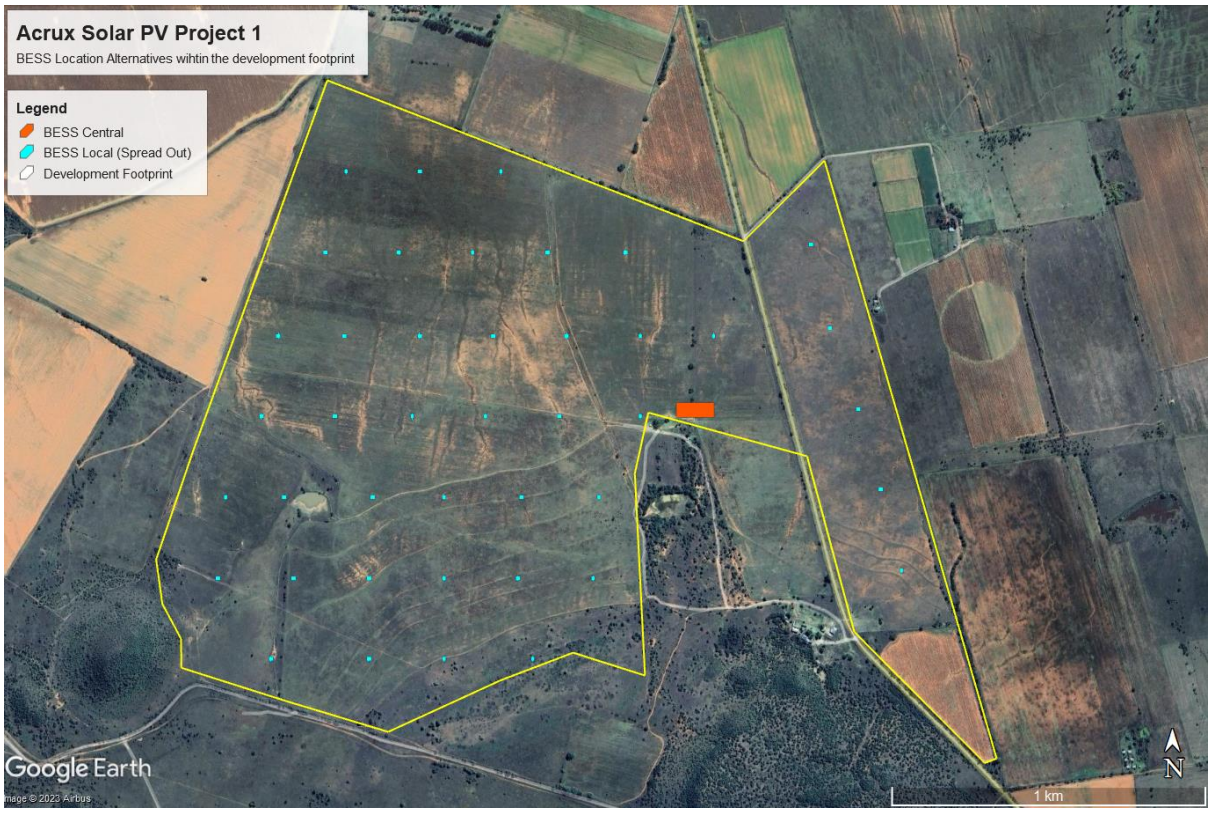


**Figure 2.8:** Acrux Solar PV Project One BESS location alternatives.

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

### 2.4.6 'Do-nothing' Alternative

This alternative considers the option of 'do nothing' and maintaining the status quo of the affected environment. The description provided in section 7 of this report could be considered the baseline conditions (*status quo*) to persist should the no-go / 'do nothing' alternative be preferred. The site is currently zoned for agricultural land uses. Should the proposed activity not proceed, the site will remain unchanged (with no negative or positive impacts to occur) and will continue to be used for the current land uses present.

The 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 in terms of economic growth.
- Meeting of future demand for additional energy generation in a most economic and rapid manner.
- Provision of clean, renewable energy in an area where the renewable energy resource is optimally available.

## 2.5 Project Development Phases and Services Required

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

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

| | |
|---|---|
| Design and Pre-Construction Phase | • Post-authorisation factors influence the final design of the facility and therefore small-scale modifications of the PV array or associated infrastructure are expected.<br>• The EPC Contractor, responsible for the overall construction of the project, will comply with the approved facility design as far as possible. However, the construction process is dynamic and unforeseen changes to the project specifications may take place.<br>• 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.<br>• Geotechnical surveys are executed by geotechnical engineers and geologists with the purpose to design earthworks and foundations |

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| | 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.<br>• At the peak of construction, the proposed project is likely to create a maximum of 500 employment opportunities. These employment opportunities will be temporary, and will last for a period of approximately 18 -24 months (i.e., the length of construction).<br>• Employment opportunities generated during the construction phase will include low skilled, semi-skilled, and skilled opportunities.<br>• Employment opportunities for the proposed PV facility will peak during the construction phase and significantly decline during the operation phase.<br>• 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).<br>• 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.<br>• 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.<br>• Laydown and storage areas will be required for typical construction equipment. Once the required equipment has been transported |

[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.

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| | 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.<br>• Installation of the PV solar panels and structural and electrical infrastructure will be undertaken that is required for the operation of the facility.<br>• 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.<br>• The Battery Energy Storage System will be installed as per the factory instructions and will be assembled off site and delivered to site for installation.<br>• The establishment of the auxiliary 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.<br>• A power line is constructed by surveying the power line route / corridor, constructing foundations for the towers, installing the towers, stringing the conductors, and finally rehabilitating disturbed areas and protecting erosion sensitive areas.<br>• 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 – 25 years.<br>• The facility will operate continuously, 7 days a week, during daylight hours. |

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| | • Operation phase is likely to create a maximum of 25 permanent employment opportunities.<br>• 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 25-year operational lifespan, will determine if the facility will be decommissioned or the operation phase will be extended.<br>• 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.<br>• Site preparation activities include confirming the integrity of the access to the site to accommodate the required decommissioning equipment.<br>• The equipment to be removed will depend on the land use proposed for the site at the time.<br>• 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.<br>• 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. Four (04) options will be considered, in order of priority by the Developer:

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

The estimated amount of water required during construction is 30 500 $m^3$. The estimated maximum amount of water required during the operational phase is 10 000 $m^3$ per annum. These values will be confirmed at a later stage in the project

### 2. Stormwater Management

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

### 3. Sanitation

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

No effluent will be produced during operation of the facility, except for normal sewage from site and operations staff. This will be collected and treated as per normal standards using a conservancy tank. Sewage will be stored in a conservancy tank and collected (honey-sucker) by a service provider, either the Local Municipality or a Private Contractor, and treated at an approved facility off site.

### 4. Waste Management

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

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

### 5. Electricity Provision

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

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

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

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

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

- During the Scoping Phase the Applicant had indicated that the generation capacity of the Acrux Solar PV Project One will be 150 MWac. Following the design of the draft development footprint and the modelling thereof the Applicant has indicated that the proposed development footprint within the approved development area would be able to generate 200 MWac and not 150 MWac. This increase in the generation capacity is not considered to be problematic as the entire extent of the development area was assessed. An amended Application for Environmental Authorisation has been submitted to the DFFE with the draft EIA Report to reflect this

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

- As part of the Scoping Phase the Applicant had provided two grid connection route alternatives to be assessed, however following consideration of the routes, both of which connect into the existing Harvard Main Transmission Substation, it was noted that both routes share a very similar alignment. Based on the alignment similarities and the need to assess a wider corridor to enable the avoidance of sensitive environmental features, the Applicant provided one consolidated grid connection corridor for assessment as part of the EIA Phase. This is considered to be the most technically feasible approach in assessing and authorising the grid connection corridor which provides flexibility in terms of the route to connect the Acrux Solar PV Project One to the existing Harvard Main Transmission Substation. Therefore, no new routes are proposed, the only change is how the has been packaged within the draft EIA Report.

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

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

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

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

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| the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation. | methodology in determining the impact assessment but rather small changes in the project description. |

# 3 POLICY AND LEGISLATIVE CONTEXT

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

## 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).
- Mangaung Metropolitan Municipality Spatial Development Framework (SDF) (2020)

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.

- *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 financial 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".

- *The Equator Principles IV (July, 2020)*

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

The EPs comprise the following principles:

**Principle 1:** Review and Categorisation

**Principle 2:** Environmental and Social Assessment.

**Principle 3:** Applicable Environmental and Social Standards.

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

**Principle 5:** Stakeholder Engagement

**Principle 6:** Grievance Mechanism

**Principle 7:** Independent Review

**Principle 8:** Covenants

**Principle 9:** Independent Monitoring and Reporting

**Principle 10:** Reporting and Transparency

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

Projects can be categorized as follows:

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

Based on the above-mentioned criteria, the Acrux Solar PV Project One 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 Project. In terms of the EPs, South Africa is a non-designated country (as at 4 March 2020), and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability, and Environmental Health and Safety (EHS) Guidelines.

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

- *IFC's Performance Standards on Environmental and Social Sustainability (January 2012)*

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

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

The Performance Standards comprise the following:

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

**Performance Standard 2:** Labour and Working Conditions.

**Performance Standard 3:** Resource Efficiency and Pollution Prevention.

**Performance Standard 4:** Community Health, Safety and Security.

**Performance Standard 5:** Land Acquisition and Involuntary Resettlement.

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

**Performance Standard 7:** Indigenous Peoples.

**Performance Standard 8:** Cultural Heritage.

Performance Standard 1 establishes the importance of:

i) Integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects.

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

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

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

Table 3.1: Legislative Context Relevant to the Acrux Solar PV Project One.

| Legislation and Relevant Authority | Summary and Relevance for the Development |
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| **The Constitution of South Africa (Act No. 108 of 1996)**<br><br>**Administering Authority:**<br><br>**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.<br><br>The development of Acrux Solar PV Project One 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)** | 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 |

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| **Administering Authority:**<br><br>**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 Development, Tourism and Environmental Affairs (DESTEA)** | 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.<br><br>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.<br><br>The S&EIA process undertaken for Acrux Solar PV Project One is in-line with the requirements of NEMA for the Application for Environmental Authorisation. |
| **The National Energy Act (Act No. 34 of 2008)**<br><br>**Administering Authority:**<br><br>**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).<br><br>Considering that Acrux Solar PV Project One 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. |

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| **Electricity Regulation Act (Act No. 4 of 2006) (as amended)**<br><br>**Administering Authority:**<br><br>**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.<br><br>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)**<br><br>**Administering Authority:**<br><br>**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.<br><br>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.<br><br>The site includes two wetlands, one being a seepage wetland and one a depression wetland. The development footprint is located within 32 m of the wetlands, but not within 16 m as per the |

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| | recommendations of the wetland specialist (Appendix E2). 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)<br><br>Administering Authority:<br><br>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."<br><br>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)<br><br>Administering Authority:<br><br>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.<br><br>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 |

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| | 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)<br><br>Administering Authority:<br><br>Department of Forestry, Fisheries and the Environment (DFFE) | 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.<br><br>Regulations No. R248 (of 31 March 2010) promulgated in terms of Section 21(1)(a) of the National Environmental Management Act: Air Quality Act (39 of 2004) determine that an Atmospheric Emission License (AEL) is required for certain listed activities, which result in atmospheric emissions which have or may have a detrimental effect on the environment. The Regulation also sets out the minimum emission standards for the listed activities. It is not envisaged that an Atmospheric Emission License will be required for the proposed development. |
| The National Heritage Resources Act (Act No. 25 of 1999)<br><br>Administering Authority:<br><br>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. |

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| | 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.<br><br>A case file with reference number 21202 has been opened on SAHRIS for the Acrux Solar PV Project One 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 E7, and the Palaeontological Impact Assessment is included as Appendix E8. |
| Conservation of Agricultural Resources Act (Act No. 85 of 1983)<br><br>Administering Authority:<br><br>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.<br><br>Consent will be required from the Department of Agriculture, Forestry and Fisheries (now known as the DFFE) in order to confirm that the proposed development is not located on high potential agricultural land and to approve the long-term lease agreement. A Soils and Agricultural Compliance Statement has been provided for the Acrux Solar PV Project One and is included as Appendix E4. |
| Subdivision of Agricultural Land Act (70 of 1970) (SALA)<br><br>Administering Authority: | The purpose of this Act is to control the subdivision of agricultural land and, in connection therewith, the use of agricultural land. Applications are lodged with the Department of Agriculture, Land Reform and Rural Development (DALRRD) to allow for the subdivision of agricultural land, as well as other prohibited actions in terms of the Act. In order to limit the potential threat that solar energy development could pose to agricultural |

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| Department of Agriculture, Land Reform and Rural Development (DALRRD) | 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)<br><br>Administering Authority:<br><br>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)<br><br>Administering Authority:<br><br>Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment) | The purposes of this Act are to:<br><br>(a) promote the sustainable management and development of forests for the benefit of all;<br><br>(b) create the conditions necessary to restructure forestry in State forests;<br><br>(c) provide special measures for the protection of certain forests and trees:<br><br>(d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes. |

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| | (e) promote community forestry;<br><br>(f) promote greater participation in all aspects of forestry and the forest products industry by persons disadvantaged by unfair discrimination.<br><br>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.<br><br>A Terrestrial Ecology Baseline and Impact Assessment has been undertaken for the Acrux Solar PV Project One and is included in Appendix E1. |
| National Road Traffic Act (93 of 1996) (NRTA)<br><br>Administering Authority:<br><br>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".<br><br>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 the Acrux Solar PV Project One.

| Policy and Relevant Authority | Summary and Relevance for the Development |
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| The White Paper on the Energy Policy of the Republic of South Africa (1998)<br><br>Administering Authority:<br><br>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:<br><br>• Increasing access to affordable energy services<br>• Improving energy governance<br>• Stimulating economic development<br>• Managing energy-related environmental and health impacts<br>• Securing supply through diversity<br>• Energy policy priorities<br><br>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.<br><br>The White Paper notes that renewable energy applications have specific characteristics that need to be considered. Advantages include:<br><br>• Minimal environmental impacts in operation in comparison with traditional supply technologies; and |

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| | • Generally lower running costs, and high labour intensities.<br><br>Disadvantages include:<br><br>• Higher capital costs in some cases;<br>• Lower energy densities; and<br>• Lower levels of availability, depending on specific conditions, especially with sun and wind-based systems.<br><br>Acrux Solar PV Project One 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)**<br><br>**Administering Authority:**<br><br>**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.<br><br>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* |

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| | *heating and bio-fuels. This is approximately 4% (1667 MW) of the projected electricity demand for 2013 (41539 MW) (Executive Summary, ix).*<br><br>The Acrux Solar PV Project One 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)**<br><br>**Administering Authority:**<br><br>**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.<br><br>"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 One. 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).<br><br>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:<br><br>"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 |

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| | 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).<br><br>"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).<br><br>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."<br><br>"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).<br><br>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 |

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| | 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).<br><br>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).<br><br>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 |

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| | renewable technologies' potential to diversify the electricity mix, create new industries and job opportunities and localize across the value chain (RSA, 2019:13).<br><br>The Acrux Solar PV Project One 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<br><br>Administering Authority:<br><br>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.<br><br>Acrux Solar PV Project One will contribute to the intervention strategy as identified within the plan. |
| National Infrastructure Plan of South Africa (2012)<br><br>Administering Authority: | 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 |

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| Presidential Infrastructure Coordinating Commission | 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 enhance development and growth. Of the eighteen (18), five (5) are geographically focused, three (3) spatial, three (3) energy, three (3) social infrastructure, two (2) knowledge, one (1) regional integration, and one (1) water and sanitation focussed. The three (3) SIPs according to the Plan, which are energy focused and correlate to the proposed project are as follow:<br><br>• SIP 8: Green energy in support of the South African economy;<br>• SIP 9: Electricity generation to support socio-economic development; and<br>• SIP 10: Electricity transmission and distribution for all.<br><br>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).<br><br>The Acrux Solar PV Project One 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. |

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| **New Growth Path Framework**<br><br>**Administering Authority:**<br><br>**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).<br><br>This framework sets out the markers for job creation and growth and identifies where there are viable changes in the character and structure of production, in order to create a more inclusive, greener economy in the long-term. It is stated in the framework that in order for this framework to reach its objectives, the Government is committed to:<br><br>• Identify the possible areas of employment creation; and<br>• 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).<br><br>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.<br><br>Considering that the construction of and investment in renewable energy is a key area identified within the framework, the Acrux Solar PV Project One is considered to be in-line with the framework. |
| **Climate Change Bill (2018)** | 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 |

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| **Administering Authority:**<br><br>**National Department of Environmental Affairs (now known as the Department of Forestry, Fisheries and the Environment)** | 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:<br><br>• 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;<br>• 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;<br>• 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.<br><br>The Acrux Solar PV Project One comprises a renewable energy generation facility and would not result in the generation or release of emissions during its operation. |
| **Climate Change Bill (2021)**<br><br>**Administering Authority:**<br><br>**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. |

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| | 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.<br><br>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.<br><br>The Acrux Solar PV Project One 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)**<br><br>**Administering Authority:**<br><br>**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:<br><br>• 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. |

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| | • 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.<br><br>The Acrux Solar PV Project One 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)**<br><br>**Administering Authority:**<br><br>**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.<br><br>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).<br><br>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 |

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| | 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.<br><br>The Acrux Solar PV Project One 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)**<br><br>**Administering Authority:**<br><br>**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'.<br><br>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:<br><br>• Indicates the spatial implications of the core development objectives of the Free State Provincial Growth and Development Strategy.<br>• Serves as a spatial plan that facilitates local economic development.<br>• Lays down strategies, proposals and guidelines as it relates to sustainable development. |

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| | • Facilitates cross-boundary co-operation between municipalities, adjoining provinces, and bordering countries.<br>• Serves as a manual for integration and standardisation of the planning frameworks of all spheres of government in the Province.<br><br>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.<br><br>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.<br><br>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.<br><br>The development of Acrux Solar PV Project One is in-line with the framework based on the contributions and opportunities presented by development of this nature. |
| **Mangaung Metropolitan Municipality Draft** | 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 |

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| **Integrated Development Plan (IDP) 2022/2027 (2022)**<br><br>**Administering Authority:**<br><br>**Mangaung Metropolitan Municipality** | 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.<br><br>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.<br><br>The IDP of the municipal area within which the Acrux Solar PV Project One 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)**<br><br>**Administering Authority:** | 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 |

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| **Mangaung Metropolitan Municipality** | 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.<br><br>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 One. |
| **Mangaung Metropolitan Municipality Spatial Development Framework (SDF) (2020)**<br><br>**Administering Authority:**<br><br>**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:<br><br>• 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.<br>• 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.<br>• Objective 3: indicate in as much detail as possible to stakeholders the desired future spatial form for the metropolitan area.<br>• Objective 4: highlight planning, environmental, infrastructure and institutional issues that gave rise to the proposal.<br>• Objective 5: provide all stakeholders an opportunity to participate during the process of formulating the SPF.<br>• 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.<br>• 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.<br>• Objective 8: Identify areas for economic opportunities, particularly in the industrial, commercial, agricultural and tourism sectors. |

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| | • Objective 9: Identify infrastructure needs and services constraints and bring forward tangible solutions.<br>• Objective 10: Accommodate the growing housing needs taking into account the current backlogs and the projected need for development of various housing methodologies.<br>• Objective 11: protect the natural environment, and more specifically hydrological and topographical resources, biodiversity areas, and high potential agricultural land.<br><br>The development of the Acrux Solar PV Project One will contribute to the goals of the area, albeit to a limited extent. |

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

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

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

# 4 NEED AND DESIRABILITY

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

## 4.1 Need for the Proposed Development

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

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

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

When considering the current position of South Africa in terms of $CO_2$ emissions, the country lies 14$^{th}$ in the world. The National Greenhouse Gas Inventory Report (Dec 2022) indicates in 2020 81% of the total emissions of South Africa was emitted by the energy sector. Within

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

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

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

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

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

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

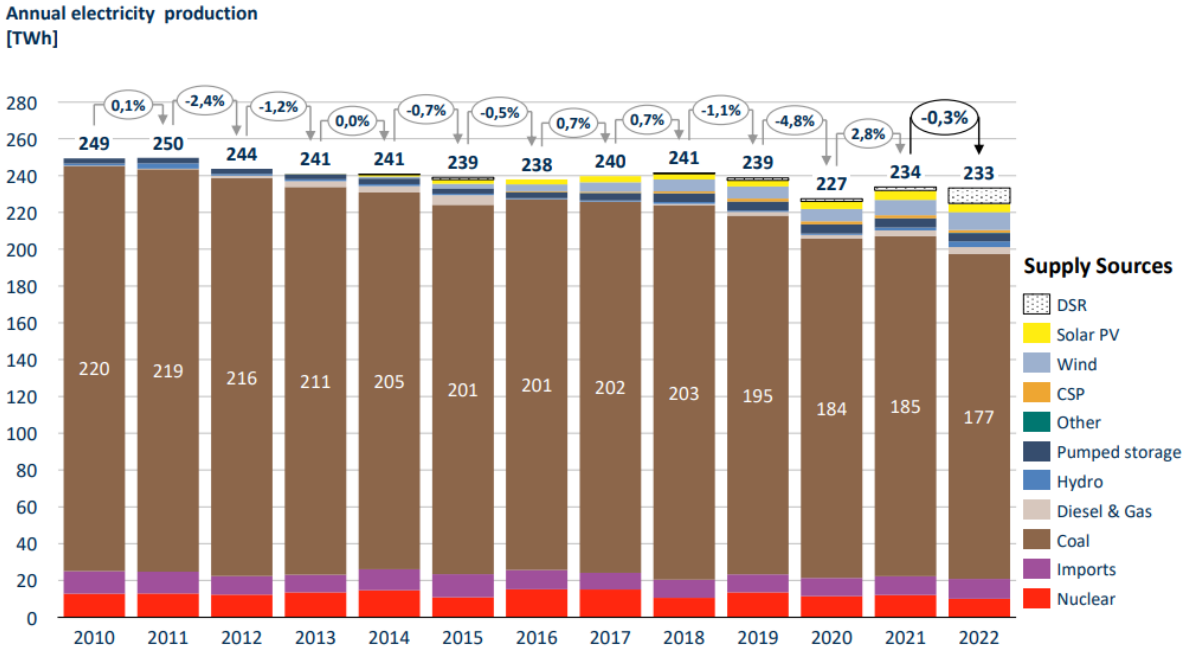



Figure 4.1: Annual electricity production in South Africa from 2010 to 2022.

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

| Funding requirements 2023–2027 | ZAR billion (US$ billion) |
|---|---|
| Electricity Sector | 711.4 (47.2) |
| New Energy Vehicle (NEV) Sector | 128.1 (8.5) |
| Green Hydrogen ($GH_2$) Sector | 319 (21.2) |
| Skills development | 2.7 (0.18) |
| Municipal capacity | 319.1 (21.3) |
| **TOTAL** | **1 480 (98.7)** |

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

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

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

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

The receptiveness of the development area and development footprint for the construction and operation of the Acrux Solar PV Project One 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 were solar resource, land availability, access to the national grid, geographical and socio-economic considerations, availability of existing infrastructure, topography and consideration of sensitive environmental features through environmental screening. Through this process the Applicant confirmed the receptiveness of the site for the development and thereby confirmed the receptiveness of the site for the placement of the associated development footprint.

The feasibility of the site for the housing of the development footprint provides an indication of the desirability of the development within the site. The Acrux Solar PV Project One is proposed to be constructed outside of the urban edge of the surrounding towns on privately-owned properties. No agricultural activities are currently taking place on the development footprint. The affected farm portion has not been considered for an alternative future land use such as urban development or mining.

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

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

- Utilisation of significant renewable energy resource and increased supply - Given that renewables can often be deployed in a short timeframe and in a decentralised manner close to consumers, they offer the opportunity for improving grid strength and supply quality in the short-term, while reducing expensive distribution losses.

- Reduced dependence on fossil fuels – The operation of the Acrux Solar PV Project One will have a positive macro-economic impact by reducing South Africa's dependence on fossil fuel generated power and assisting the country in meeting its growing electricity demand.

- Contribution to the fight against climate change - The uptake of renewable energy offers the opportunity to address energy needs in an environmentally responsible manner and thereby allows South Africa to contribute towards mitigating climate change through the reduction of GHG emissions. The development of the Acrux Solar PV Project One, 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 utilisation 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 (where available) 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 approximately 25 permanent employment opportunities during the operational phase.

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

- The opportunities presented within the development area to implement the mitigation hierarchy through the avoidance of sensitive environmental features that are not considered to be available for development due to the environmental value that it holds within the landscape. Even with avoidance it is possible to construct and operate an efficient solar PV facility that would be able to generate up to 200 MWac.
- With the slow transition to decarbonisation and the fact that limited other solar energy facilities are proposed within 30km of the site, there is a need for such development within the area to kick-start the introduction of renewable energy development and solar energy generation within the Bloemfontein area.

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

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report. | The need and desirability of the development of the Acrux Solar PV Project One within the development area and development footprint has been fully considered within section 4. |

# 5 APPROACH TO THE PROCESS

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

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

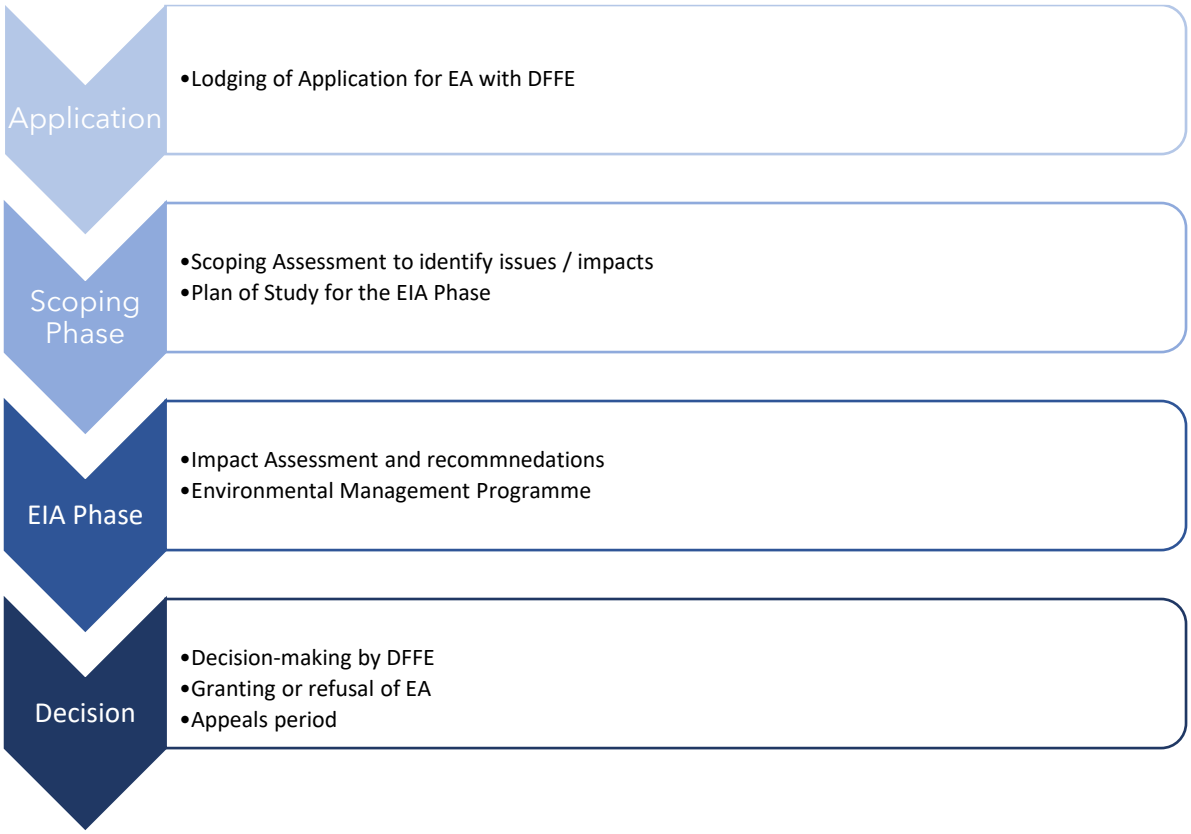
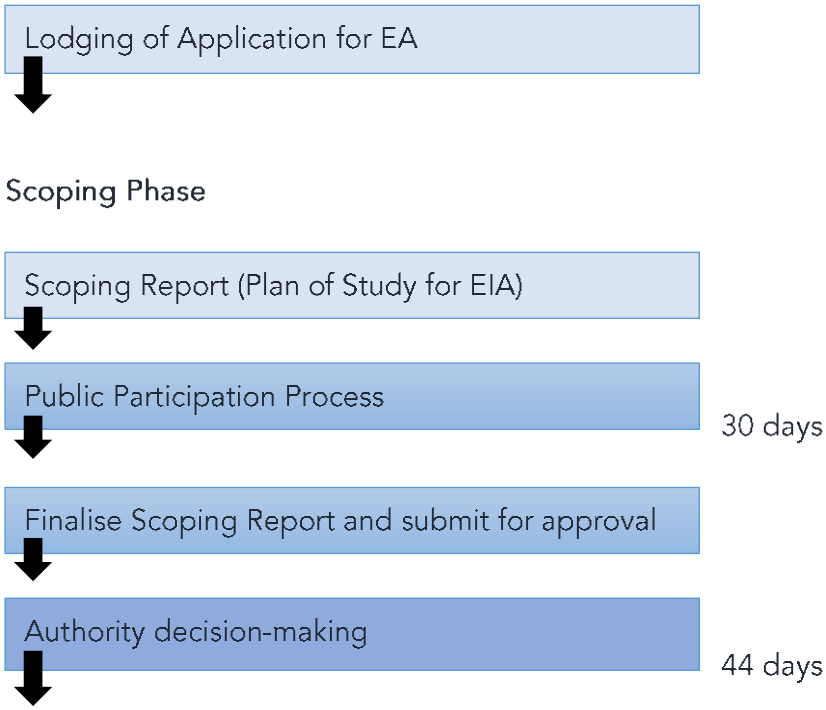



**Figure 5.1**: The phases of an EIA Process.

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

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



EIA Phase


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

The final Scoping Report and Plan of Study for the EIA was submitted to the competent authority for decision-making within 42 days of lodging the Application for Environmental Authorisation (this timeframe includes a 30-day review and comment period of the draft Scoping Report). Acceptance of Scoping was received by the DFFE on 14 August 2023 which includes specific requirements that must be complied within in the EIA Report. The requirements of the Acceptance of Scoping are included in section 5.1 below.

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

## 5.1 Requirements for the EIA Report: DFFE Acceptance of Scoping

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

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

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

| Requirement | Response / Proof of Compliance |
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| (a) Listed activities | |
| (i) The ElAr must provide an assessment of the impacts and mitigation measures for each of the listed activities applied for. | The draft EIA Report assesses the development and associated developmental activities of the Acrux Solar PV Project One on a holistic level which considers the development of the entire facility within the development footprint and the current affected environment present therein. Therefore, the impact assessment undertaken in Section 8 of this draft EIA Report assesses the complete project and the activities associated thereto. |
| (ii) The listed activities represented in the ElAr, and the application form must be the same and correct. | An amended Application for Environmental Authorisation has been submitted to the DFFE with the draft EIA Report which provides the updated details of the Registered EAP and also include the exact same listed activities and project descriptions as included in this draft EIA Report. |
| (iii) The ElAr must assess the correct sub-listed activity for each listed activity applied for. | The draft EIA Report assesses the development and associated developmental activities of the Acrux Solar PV Project One on a holistic level which considers the development of the entire facility within the development footprint and the current affected environment present therein. Therefore, the impact assessment |

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| | undertaken in Section 8 of this draft EIA Report assesses the complete project and the activities associated thereto. |
| <u>(b) Public Participation</u> | |
| (i) Please ensure that comments from all relevant stakeholders are submitted to the Department with the EIAr. | All comments received to date on the EIA process has been submitted to the DFFE as part of the draft EIA Report. |
| (ii) Please ensure that all issues raised, and comments received during the circulation of the draft SR and draft EIAr from registered I&APs and organs of state which have jurisdiction in respect of the proposed activity are adequately addressed in the final EIAr. Proof of correspondence with the various stakeholders must be included in the final EIAr. Should you be unable to obtain comments, proof should be submitted to the Department of the attempts that were made to obtain comments. | All comments raised and recorded during the Scoping Phase of the EIA Process has been included in Appendix C of this draft EIA Report. All comments have been addressed as part of this draft EIA Report.<br><br>Proof of correspondence and notification of the availability of the draft EIA Report is included in Appendix C. Proof of attempts made to obtain further comment will be included in the final EIA Report to be submitted to DFFE for decision-making. |
| (iii) A Comments and Response trail report (C&R) must be submitted with the final EIAr. The C&R report must incorporate all comments for this development. Please refrain from summarising comments made by I&APs. All comments from I&APs must be copied verbatim and responded to clearly. Please note that a response such as "noted" is not regarded as an adequate response to I&AP's comments. | A comments and responses report is included in Appendix C7. The report will be updated following the 30-day review and comment period of the draft EIA Report to include all comments received and appropriate responses.<br><br>All comments have been and will be copied verbatim and an adequate response will be provided to each comment. |

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| (iv) Comments from I&APs must not be split and arranged into categories. Comments from each submission must be responded to individually. | The comments and responses report (Appendix C7) includes the comments from each submission received and have been responded to individually. |
| (v) The Public Participation Process must be conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations, 2014, as amended. | The Public Participation Process has been conducted in terms of Regulation 39, 40, 41, 42, 43 & 44 of the EIA Regulations as per the feedback provided on the Public Participation Process in section 6 and the proof included in Appendix C. |
| (vi) The EAP is requested to contact the Department to make the necessary arrangements to conduct a site inspection prior to the submission of the final EIAr. | The EAP contacted the DFFE case officer on 20 September 2023 via email (Appendix C for proof) to start the arrangements for the site inspection. |
| (c) Alternatives | |
| (i) Please provide a description of each of the preferred alternative type and provide detailed motivation on why it is preferred. | All alternatives under assessment as part of the draft EIA Report is listed and described in section 2.4. The preferred alternative has been identified in section 10 of this draft EIA Report. |
| (d) Specialist assessments | |
| (i) The EAP must ensure that the terms of reference for all the identified specialist studies must include the following: | Appendix E9 of the draft EIA Report provides the specialist terms of reference. |

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| ➢ A detailed description of the study's methodology; indication of the locations and descriptions of the development footprint, and all other associated infrastructures that they have assessed and are recommending for authorisations. | Appendix E9 of the draft EIA Report provides the specialist terms of reference, including the project details and the assessment methodology to be applied.<br><br>Each respective specialist study also provides further details of the methodologies applied in terms of the field of study under consideration. Refer to Appendix E. |
| ➢ Provide a detailed description of all limitations to the studies. All specialist studies must be conducted in the right season and providing that as a limitation will not be allowed. | Each respective specialist study provides limitations and gps in knowledge (where relevant) in terms of the field of study under consideration. Refer to Appendix E. |
| ➢ Please note that the Department considers a 'no-go' area, as an area where no development of any infrastructure is allowed; therefore, no development of associated infrastructure including access roads is allowed in the 'no-go' areas. | The definition of 'no-go' area of the Department is noted and agreed to. |
| ➢ Should the specialist definition of 'no-go' area differ from the Departments definition; this must be clearly indicated. The specialist must also indicate the 'no-go' area's buffer if applicable. | The specialist definition of 'no-go' area aligns with the definition of the Department. |
| ➢ All specialist studies must be final, and provide detailed/practical mitigation measures for the preferred | All specialist studies are final and to not include any recommendations which constitute post EA studies. |

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| alternative and recommendations, and must not recommend further studies to be completed post EA. | |
| ➢ Should a specialist recommend specific mitigation measures, these must be clearly indicated. | Specific recommendations and mitigation measure identified by the specialists have been included in section 8.1 and the relevant EMPrs (Appendix G) |
| ➢ Regarding cumulative impacts:<br>- Clearly defined cumulative impacts and where possible the size of the identified impact must be quantified and indicated, i.e., hectares of cumulatively transformed land.<br>- A detailed process flow to indicate how the specialist's recommendations, mitigation measures and conclusions from the various similar developments in the area were taken into consideration in the assessment of cumulative impacts and when the conclusion and mitigation measures were drafted for this project.<br>- Identified cumulative impacts associated with the proposed development must be rated with the significance rating methodology used in the process.<br>- The significance rating must also inform the need and desirability of the proposed development.<br>- A cumulative impact environmental statement on whether the proposed development must proceed. | A cumulative impact assessment has been undertaken and is included as section 9 of this draft EIA Report. The cumulative section complies with the requirements of the Department in this regard. |

<table>
<tr><td>(ii) Should the appointed specialists specify contradicting recommendations, the EAP must clearly indicate the most reasonable recommendation and substantiate this with defendable reasons; and were necessary, include further expertise advice.</td><td>No contradicting recommendations have been specified by the specialists.</td></tr>
<tr><td>(iii) The following Specialist Assessments will form part of the ElAr:<br><br><table><tr><td>Specialist study</td><td>Company</td></tr><tr><td>Ecological Impact Assessment</td><td>The Biodiversity Company</td></tr><tr><td>Avifaunal Impact Assessment</td><td>The Biodiversity Company</td></tr><tr><td>Wetland Baseline and Risk Assessment</td><td>The Biodiversity Company</td></tr><tr><td>Soil and Agricultural Impact Assessment</td><td>The Biodiversity Company</td></tr><tr><td>Heritage Impact Assessment</td><td>J van Schalkwyk Heritage Consultant</td></tr><tr><td>Paleontological Study</td><td>Banzai Environmental (Pty) Ltd</td></tr><tr><td>Social Impact Assessment</td><td>Donaway Environmental Consultants</td></tr><tr><td>Visual Impact Assessment</td><td>Donaway Environmental Consultants</td></tr></table></td><td>It is confirmed that the list of Specialist Assessment have been included as part of the draft EIA Report as follows:<br><br>• Appendix E1: Terrestrial Ecology Baseline and Impact Assessment<br>• Appendix E2: Wetland Baseline and Risk Assessment<br>• Appendix E3: Avifauna Impact Assessment<br>• Appendix E4: Soil and Agricultural Compliance Statement<br>• Appendix E5: Visual Impact Assessment<br>• Appendix E6: Social Impact Assessment<br>• Appendix E7: Heritage Impact Assessment<br>• Appendix E8: Palaeontolgocial Impact Assessment<br><br>The assessments have been undertaken by the relevant specialists listed by the Department in the Acceptance of Scoping.</td></tr>
<tr><td colspan="2"><u>(e) General</u></td></tr>
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| (i) A construction and operational phase EMPr that includes mitigation and monitoring measures must be submitted with the final ElAr. | The following EMPrs form part of the draft EIA Report:<br>• Appendix G1: Environmental Management Programme for the Acrux Solar PV Project One<br>• Appendix G2: Generic Environmental Management Programme for the Overhead Power Line<br>• Appendix G3: Generic Environmental Management Programme for the Substation |
| The applicant is hereby reminded to comply with the requirements of Regulation 45 of GN R982 of 04 December 2014, as amendment, with regard to the time period allowed for complying with the requirements of the Regulations. | The prescribed timeframes as per the EIA Regulations are noted and will be adhered to accordingly. |
| You are hereby reminded of Section 24F of the National Environmental Management Act, Act No. 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the Department. | The Applicant aknowledges that no activity may commence prior to an environmental authorisation being granted by the Department. |

## 5.2 Assessment of Potential Impacts and Issues

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

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

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

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

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

| Theme and Sensitivity | Study Undertaken | Comment / Motivation |
|---|---|---|
| Agricultural Impact Assessment<br><br>Sensitivity: High | Yes | Feature(s): Old fields and potential for crop cultivation. Low to moderate land capability.<br><br>The specialist disputes the high sensitivity rating. The proposed project is assigned an overall "Moderate" land capability sensitivity, with small patches that are characterised by "Very low to Low" land capability sensitivity. The land capability and land potential of the resources in the regulated area are both characterised with "Moderate" sensitivities, which conforms to the requirements of an agricultural compliance statement only.<br><br>Refer to Appendix E6 for the Soils and Agricultural Compliance Statement. |
| Animal Species Assessment<br><br>Sensitivity: Medium | Yes | Feature(s): Presence of sensitive animal species i.e., *Mammalia, Hydrictis maculicollis.*<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for various faunal species.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| Aquatic Biodiversity | Yes | Feature(s): The project area lies in close proximity to a strategic water source area.<br><br>The specialist disputes the high sensitivity rating. The sensitivity is confirmed as moderate. This is based on the opportunity for the development footprint to avoid wetland features. |

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| Impact Assessment<br><br>Sensitivity: Very High | | Refer to Appendix E2 for the Wetland Baseline and Risk Assessment. |
| Archaeological and Cultural Heritage Impact Assessment<br><br>Sensitivity: Low | Yes | The specialist identified what seems to be a very old and neglected burial site – there are no indications of recent visits by descendants. Due to the dense vegetation cover and the neglected state of the burials, it was impossible to obtain details such as the number of graves or of the people who were buried there.<br><br>The specialist indicates that the impact will be low in terms of the site and therefore confirms the low sensitivity.<br><br>Refer to Appendix E7 for the Heritage Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Avian Impact Assessment<br><br>Sensitivity: Low | Yes | The specialist indicated that only three Species of Conservation Concern were recorded close to the site, but a medium diversity of species in the Degraded Grasslands and Open Savannah was assigned a medium Site Ecological Importance and the modified area a very low Site Ecological Importance. The wetland feature received a high Site Ecological Importance, but the feature has been avoided by the careful placement of the development footprint.<br><br>Refer to Appendix E3 for the Avifauna Impact Assessment. |

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| Civil Aviation Assessment<br><br>Sensitivity: Low | No | Feature(s): No major or other types of civil aviation aerodromes have been identified.<br><br>The identification of the site as low sensitivity considering civil aviation is agreed to by the EAP. No major or other types of civil aviation aerodromes were found to be located in close proximity of the site during the site visit.<br><br>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project. The project is also not located within an area considered to be of a high sensitivity. |
| Defence Theme<br><br>Sensitivity: Medium | No | Feature(s): The site could potentially lie in close proximity to a defence site.<br><br>The EAP disagrees with the sensitivity. No negative impacts are expected to occur on defence installations / sites and potential impacts will be site specific and can be mitigated. The Doppies Range Genl De Wet Training Centre (De Brug) and shooting range has been identified as an I&AP and has been registered on the project database.<br><br>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date regarding the project. |

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| Landscape / Visual Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area lies within 1.5 km of a nature reserve and is characterised by mountain tops and high ridges.<br><br>The specialist disputes the rating of very high sensitivity as all the average significance of the visual impacts will be either medium or low. It must however be noted that visual impacts are subjective and based on the perceptions of the viewer.<br><br>Refer to Appendix E5 for the Visual Impact Assessment. |
| Palaeontological Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area may comprise features that have a very high paleontological sensitivity.<br><br>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 Palaeosensitivity Map and DFFE Screening Tool. A rating of medium is therefore confirmed.<br><br>Refer to Appendix E8 for the Palaeontological Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Plant species Assessment | Yes | Feature(s): The project area may comprise of the code 257 sensitivity species.<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for provincially protected species. |

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| Sensitivity: Medium | | Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| RFI Assessment<br><br>Sensitivity: Very High | No | Feature(s): The project area is located less than 18km from a Weather Radar Installation.<br><br>The site verification is inconclusive as no desktop information could be sought. However, no negative impacts are expected to impact on weather radar installations. Impacts resulting from the proposed development are expected to occur within the project area and will be mitigated accordingly.<br><br>The South African Radio Astronomy Observatory (SARAO) and South African Weather Service have been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date by the SARAO regarding the project. |
| Terrestrial Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area comprises of a vulnerable ecosystem and Highlands Reserve<br><br>The sensitivity ratings are disputed by the specialist based on the habitats identified confirmed during the fieldwork. The secondary grassland habitat is confirmed as medium sensitivity, the degraded grassland is confirmed as low sensitivity, the modified habitat is confirmed as very low sensitivity and the water resources is confirmed as high sensitivity. The Highlands Private Nature Reserve will not be directly impacted as the site is located adjacent to the reserve.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |

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| Geotechnical Assessment<br><br>Sensitivity: Not indicated | No | The detailed Geotechnical Assessment will be conducted before construction begins as part of the micro-siting of the facility layout. The consideration of geotechnical aspects is considered to be of a technical concern rather than an environmental concern. |
| Socio-Economic Assessment<br><br>Sensitivity: Not indicated | Yes | A Social Impact Assessment is included in Appendix E6. |

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

| Theme and Sensitivity | Study Undertaken | Comment / Motivation |
|---|---|---|
| Agricultural Impact Assessment<br><br>Sensitivity: High | Yes | Feature(s): Old fields and potential for crop cultivation. Low to moderate land capability.<br><br>The specialist disputes the high sensitivity rating. The proposed project is assigned an overall "Moderate" land capability sensitivity, with small patches that are characterised by "Very low to Low" land capability sensitivity. The land capability and land potential of the resources in the regulated area are both characterised with "Moderate" sensitivities, which conforms to the requirements of an agricultural compliance statement only. |

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| | | Refer to Appendix E6 for the Soils and Agricultural Assessment. |
| Animal Species Assessment<br><br>Sensitivity: Medium | Yes | Feature(s): Presence of sensitive animal species i.e., *Mammalia, Hydrictis maculicollis.*<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for various faunal species.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| Aquatic Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area lies in close proximity to a strategic water source area.<br><br>The specialist disputes the high sensitivity rating. The sensitivity is confirmed as moderate. This is based on the opportunity for the development footprint to avoid wetland features.<br><br>Refer to Appendix E2 for the Wetland Baseline and Risk Assessment. |
| Archaeological and Cultural Heritage Impact Assessment<br><br>Sensitivity: Low | Yes | The specialist identified what seems to be a very old and neglected burial site – there are no indications of recent visits by descendants. Due to the dense vegetation cover and the neglected state of the burials, it was impossible to obtain details such as the number of graves or of the people who were buried there.<br><br>The specialist indicates that the impact will be low in terms of the site and therefore confirms the low sensitivity. |

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| | | Refer to Appendix E7 for the Heritage Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Civil Aviation Assessment<br><br>Sensitivity: High | No | Feature(s): dangerous and restricted airspace as demarcated.<br><br>The site is located within a high sensitivity, indicating a dangerous and restricted airspace as demarcated according to the screening tool report. However, it is not anticipated that the proposed activities will cause interference with civil aviation aerodromes located at a fair distance away.<br><br>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project. |
| Defence Theme<br><br>Sensitivity: Very high | No | Feature(s): The site lies in close proximity to a defence site.<br><br>The EAP disagrees with the sensitivity. No negative impacts are expected to occur on defence installations / sites and potential impacts will be site specific and can be mitigated. The Doppies Range Genl De Wet Training Centre (De Brug) and shooting range has been identified as an I&AP and has been registered on the project database.<br><br>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date regarding the project. |

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| Palaeontological Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area may comprise features that have a very high paleontological sensitivity.<br><br>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 Palaeosensitivity Map and DFFE Screening Tool. A rating of medium is therefore confirmed.<br><br>Refer to Appendix E8 for the Palaeontological Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Plant species Assessment<br><br>Sensitivity: Medium | Yes | Feature(s): The project area may comprise of 257 sensitivity species.<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for provincially protected species.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| Terrestrial Biodiversity Impact Assessment | Yes | Feature(s): The project area comprises of a vulnerable ecosystem and Highlands Reserve<br><br>The sensitivity ratings are disputed by the specialist based on the habitats identified and confirmed during the fieldwork. The secondary grassland habitat is confirmed as medium sensitivity, the degraded grassland is confirmed as low sensitivity, the modified habitat is confirmed as very low sensitivity and the water |

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| Sensitivity: Very High | | resources is confirmed as high sensitivity. The Highlands Private Nature Reserve will not be directly impacted as the site is located adjacent to the reserve.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |

**Table 5.4:** Specialist studies identified by the DFFE screening tool, power line category.

| Theme and Sensitivity | Study Undertaken | Comment / Motivation |
|---|---|---|
| Agricultural Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): Pivot irrigation and low to moderate land capability<br><br>The specialist disputes the very high sensitivity rating as the power line route will not traverse any areas under pivot irrigation. The proposed project is assigned an overall "Moderate" land capability sensitivity, with small patches that are characterised by "Very low to Low" land capability sensitivity. The land capability and land potential of the resources in the regulated area are both characterised with "Moderate" sensitivities, which conforms to the requirements of an agricultural compliance statement only.<br><br>Refer to Appendix E6 for the Soils and Agricultural Assessment. |
| Animal Species Assessment | Yes | Feature(s): Presence of sensitive animal species i.e., *Mammalia, Hydrictis maculicollis.*<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for various faunal species. |

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| Sensitivity: Medium | | Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| Aquatic Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area lies in close proximity to a strategic water source area.<br><br>The specialist disputes the high sensitivity rating. The sensitivity is confirmed as moderate. This is based on the opportunity for the development footprint to avoid wetland features.<br><br>Refer to Appendix E2 for the Wetland Baseline and Risk Assessment. |
| Archaeological and Cultural Heritage Impact Assessment<br><br>Sensitivity: Low | Yes | The specialist identified what seems to be a very old and neglected burial site – there are no indications of recent visits by descendants. Due to the dense vegetation cover and the neglected state of the burials, it was impossible to obtain details such as the number of graves or of the people who were buried there.<br><br>The specialist indicates that the impact will be low in terms of the site and therefore confirms the low sensitivity.<br><br>Refer to Appendix E7 for the Heritage Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Civil Aviation Assessment<br><br>Sensitivity: High | No | Feature(s): The site is potentially located between 8 and 15 km of other civil aviation aerodromes. |

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| | | The majority of the powerline route is located within medium sensitivity, while only a small portion of the route intrudes into a high sensitivity. It is not anticipated that the proposed activities will cause interference with civil aviation aerodromes located at a fair distance away.<br><br>The Civil Aviation Authority has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date by the CAA regarding the project. |
| Defence Theme<br><br>Sensitivity: Very high | No | Feature(s): The site lies in close proximity to a military and defence site.<br><br>The sensitivity for the majority of the grid connection corridor is of medium sensitivity, while only a small portion of the route intrudes into a high sensitivity area. A defence base has been found to be located in close proximity to the site. However, no negative impacts are expected to occur on defence installations/sites/bases and potential impacts can be mitigated. The Doppies Range Genl De Wet Training Centre (De Brug) and shooting range has been identified as an I&AP and has been registered on the project database.<br><br>The South African National Defence Force (SANDF) has been consulted regarding the development of the project since the commencement of the S&EIA Process. No specific negative impacts or issues have been raised to date regarding the project. |
| Palaeontological Impact Assessment | Yes | Feature(s): The project area may comprise features that have a very high paleontological sensitivity.<br><br>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 |

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| Sensitivity: Very High | | 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 Palaeosensitivity Map and DFFE Screening Tool. A rating of medium is therefore confirmed.<br><br>Refer to Appendix E8 for the Palaeontological Impact Assessment undertaken in terms of the National Heritage Resources Act. |
| Plant species Assessment<br><br>Sensitivity: Medium | Yes | Feature(s): The project area may comprise of 257 sensitivity species.<br><br>The specialist confirms the medium sensitivity rating for the theme which is based on the fact that the site still provides habitat for provincially protected species.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |
| Terrestrial Biodiversity Impact Assessment<br><br>Sensitivity: Very High | Yes | Feature(s): The project area comprises of a vulnerable ecosystem.<br><br>The sensitivity ratings are disputed by the specialist based on the habitats identified and confirmed during the fieldwork. The secondary grassland habitat is confirmed as medium sensitivity, the degraded grassland is confirmed as low sensitivity, the modified habitat is confirmed as very low sensitivity and the water resources is confirmed as high sensitivity.<br><br>Refer to Appendix E1 for the Terrestrial Ecology Baseline and Impact Assessment. |

## 5.3 Impact Assessment Methodology

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

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

- planning
- construction
- operation
- decommissioning

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

**Table 5.5:** Impact rating methodology.

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

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

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| 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 | | |

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| 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. | | |

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| 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. |

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

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

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

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

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

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

# 6 PUBLIC PARTICIPATION PROCESS

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

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

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

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

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

## 6.1 Identification of Stakeholder and Interested and / or Affected Parties

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

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

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

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

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

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

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

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

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

## 6.2 Formal Notification

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

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

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

- Placement of site notices announcing the EIA process at visible points along the boundary of the site, in accordance with the requirements of the EIA Regulations. Photographs and the GPS co-ordinates of the site notices are contained in Appendix C3. The site notices were placed on 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 Local Newspaper on 20 April 2023. The tear sheet of the newspaper advert is contained in Appendix C2.
- Identified I&APs, including key stakeholders representing various sectors, were directly informed of the EIA process on 26 April 2023 via registered post, telephone calls, WhatsApp and emails (as relevant). The BID was distributed with the notification. It was expected from I&APs to provide their inputs and comments by 29 May 2023.
- The draft Scoping Report was made available to all I&APs via courier, Dropbox and/or email (as relevant) for a 30-day review and comment period from **01 June 2023 to 03 July 2023.**
- The final Scoping Report was submitted to the DFFE for decision-making on **05 July 2023.**

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

- The relevant official of the competent authority (DFFE) was notified of the change of EAP via email on 24 August 2023. Proof of correspondence is included in Appendix C5.
- All registered I&APs were notified via email on 24 August 2023 of the change of EAP for the Application for EA. The contact details for the submission of queries or comments were also shared with the I&APs to enable future correspondence. Proof of correspondence is included in Appendix C5.
- The draft EIA Report has been made available to all I&APs via courier, Dropbox and/or email (as relevant) for a 30-day review and comment period from **26 September 2023 to 26 October 2023.** Hard copies of the report will be made available on request and where an I&AP does not have the resources to view the report on an online platform. Furthermore, the draft EIA Report has been uploaded

to the Blue Crane Environmental website (https://www.bcrane.co.za/public-documents/) which enables any party from the public to automatically register on the project database and gain access to the draft EIA Report.

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

- A Public Meeting will be scheduled for the Acrux Solar PV Project One to be held during the 30-day review and comment period. The planned date for the Public Meeting is 16 October. The Public Meeting will be advertised in the Bloemnuus Local Newspaper prior to the Meeting to invite the public to the Meeting and also provide the details of where and when the meeting will be held. All registered I&APs will also be invited to the Public Meeting via email and WhatsApp as relevant. Proof of all correspondence and meeting notes will be submitted with the final EIA Report to the DFFE for decision-making on the Application for Environmental authorisation.

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

41.(2)(a) Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of –

(i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and

(ii) Any alternative site.

41.(2)(b) Giving written notice, in any of the manners provided for in section 47D of the Act, to –

(i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;

(ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;

(iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;

(iv) The municipality which has jurisdiction in the area;

(v) Any organ of state having jurisdiction in respect of any aspect of the activity; and

(vi) Any other party as required by the competent authority.

41.(2)(c) Placing an advertisement in –

(i) One local newspaper; or

(ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;

41.(2)(d) Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and

41.(2)(e) Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –

(i) Illiteracy;
(ii) Disability; or
(iii) Any other disadvantage.

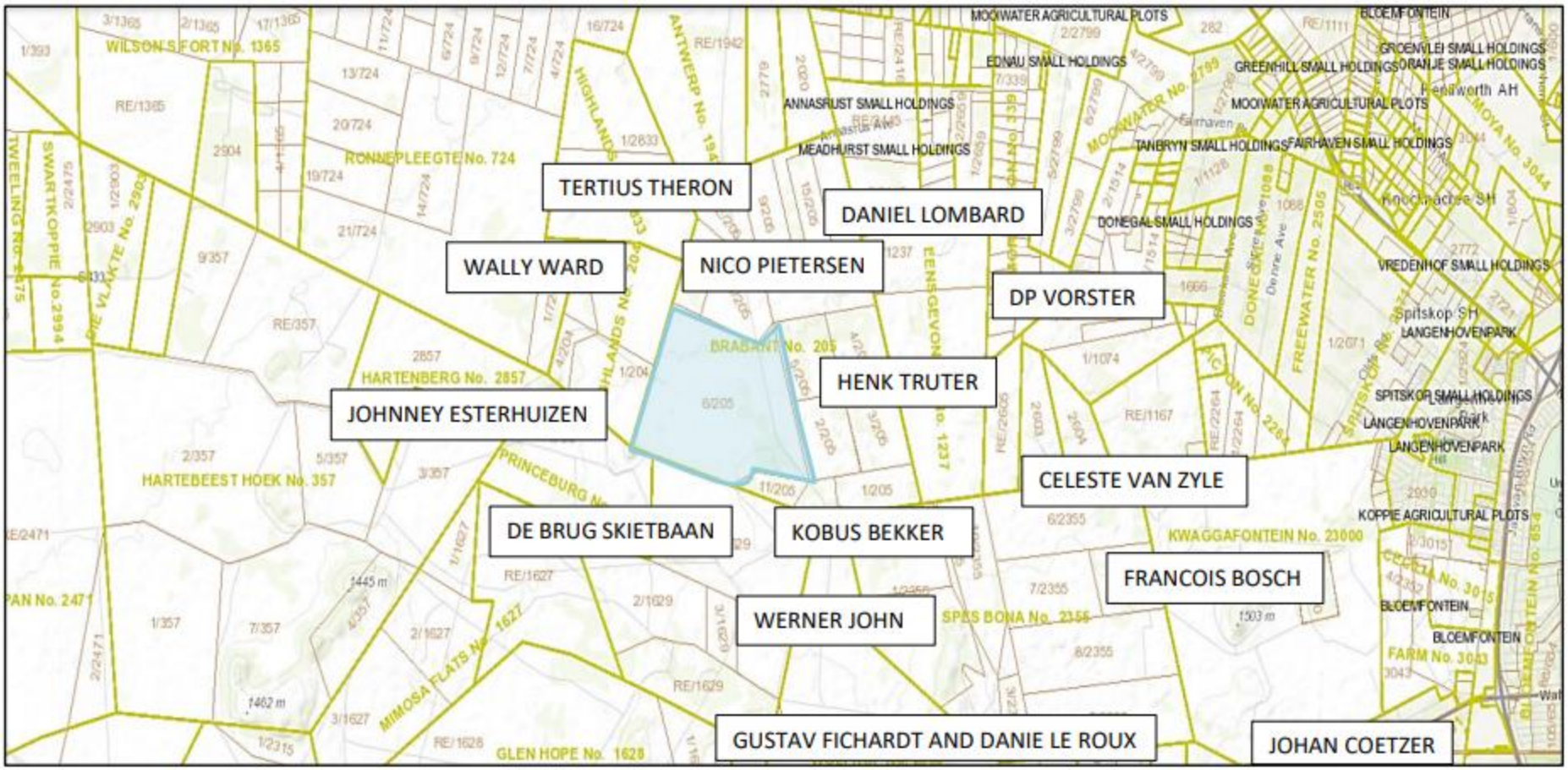


**Figure 6.1:** Acrux Solar PV Project One (indicated in Blue) in relation to the Identified Surrounding Landowners (Source: Environamics, 2023).

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

All registered I&APs on the database (Appendix C4) have been notified, as appropriate, of the availability of the draft EIA Report for a 30-day review and comment period. The I&APs have been invited to comment on the draft EIA Report within the stipulated 30-day timeframe (from **26 September 2023 to 26 October 2023**). The notification has been distributed to the I&APs on 26 September 2023.

Proof of notification and correspondence is included in Appendix C5.

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

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

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

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

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

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

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

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

44. (1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in sub regulation (1) due to –

(a) A lack of skills to read or write;

(b) Disability; or

(c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

## 6.4 Legal Requirements Complied with in Section 6 as per the Requirements of the EIA Regulations, 2014 (as amended)

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(h) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs. | The public participation process, that has been undertaken in terms of Regulation 41 of the EIA Regulations, is fully described and included in Section 6. Proof of all correspondence and proof of the public participation tasks completed is included in Appendix C of this draft EIA Report. |
| 3(1)(h)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues | A summary of the issues raised by I&APs during the 30-day review and comment period of this draft EIA Report will be |

| | |
|---|---|
| were incorporated, or the reasons for not including them | included in the final EIA 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 proposed development footprint within the affected property) and the general area in which it is located. The information provided below aims to assist the reader in understanding the receiving environment within which the project is proposed. This chapter was supplemented by research of existing available information; information gathered from on-site investigations and as received from various specialist investigations. Refer to Table 1.2 for a list of specialists that were consulted for the proposed Acrux Solar PV Project One.

## 7.1 Description of the Study Area

As presented in the Social Impact Assessment (Appendix E6), the proposed Acrux Solar PV Project One Project 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 825km$^2$, 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.

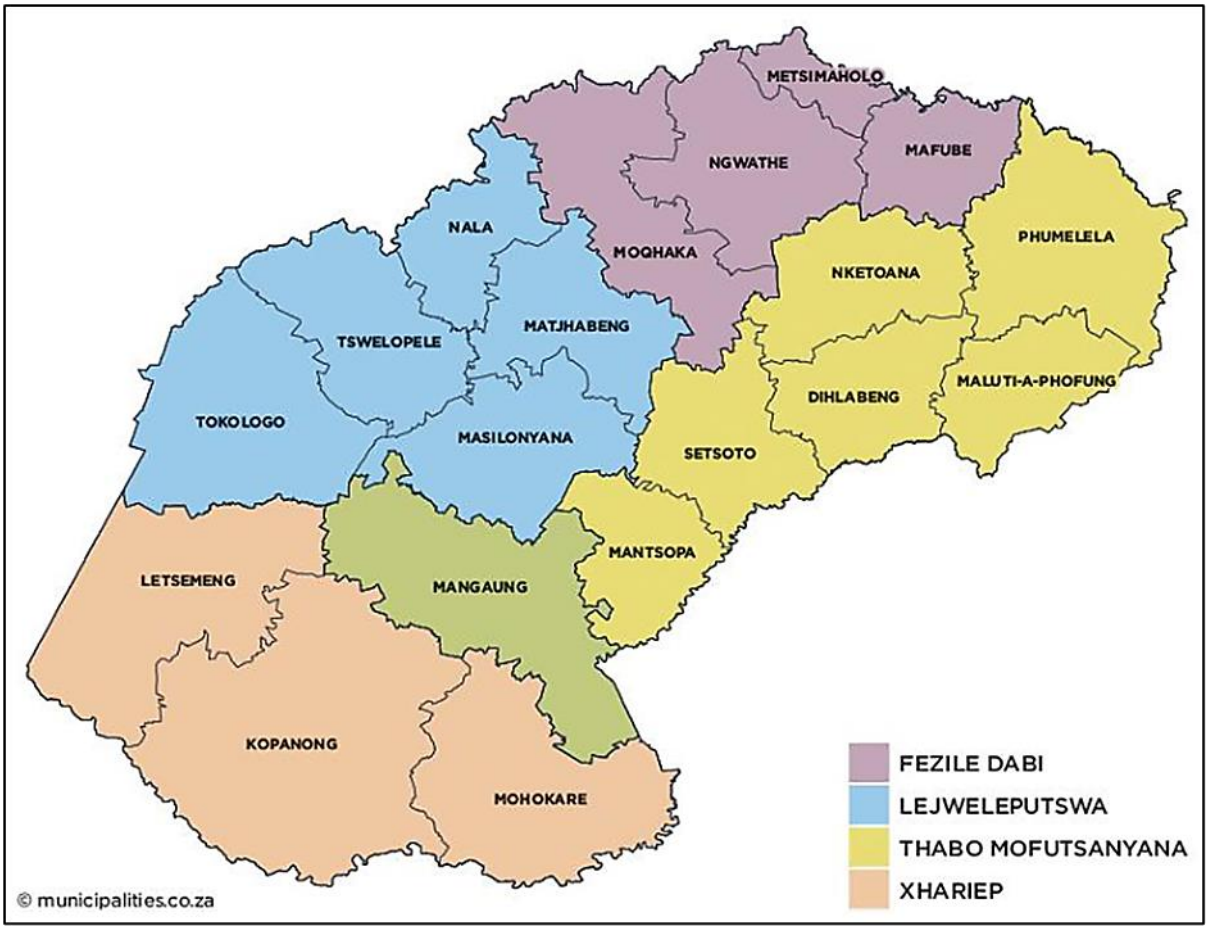


Figure 7.1: District Municipalities of the Free State Province.

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.

Refer to Figure 7.2 below for a map of the towns located within the Mangaung Metropolitan Municipality.


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.

Affected Property

Acrux Solar PV Project One (Pty) Ltd intends to develop a 200 MWac photovoltaic (PV) solar facility and associated infrastructure on Remaining extent of Portion 6 of the Farm Brabant No. 205. situated within the Mangaung Metropolitan Municipality, area of jurisdiction. The

City of Bloemfontein is located approximately 17 km east of the proposed development. The N8 national road is located south of the proposed development and the N1 national road 11 km to the east, additionally the R64 regional road is in close proximity.

The affected property has mainly been used for agricultural activities in the past including grazing and cultivation. Farm building infrastructure is also present within the affected property including housing and warehousing which has been avoided by the placement of the development footprint within the property as per the agreements between the Applicant and the landowner.

## 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 (Appendix E5) indicates that the reserve is only being used for cultivation farming with very low to no tourism potential. These features are described in more detail in the sections that follow.

## 7.3 Climatic Conditions

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 Geological, Soil and Terrain Aspects

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

When considering the land type database, the site is mainly located within the Ca 8 land type with a small portion of the grid connection located within Ca 22.

The Ca 8 land type is predominated by Bare rock, Shortland, Hutton, Oakleaf and Katspruit soil forms with also the occurrence of other soils occurring throughout the terrain. The Ca 22 land type is predominated by Valsrivier, Dundee, Katspruit and Oakleaf soil forms with also the occurrence of other soils occurring throughout the terrain. The Ca land type is characterised by soils with plinthic catena, duplex soil and margalitic soils. The geology of Ca land type includes shale, mudstone and sandstone of the Beaufort Group with many dolerite intrusions.

In terms of the terrain, the slope percentage of the development area has been calculated and majority of the area is characterised by a slope percentage between 0-10% with some irregularities in areas with slopes reaching 26%. This indicates a non-uniform topography with occurrence of some steep sloping areas being present.

As part of the field survey undertaken in May 2023, it was confirmed that the dominant soil forms present include Bainsvlei, Fernwood and Hutton soil forms. Bainsvlei soil form consists of an orthic topsoil on top of a red apedal subsoil that is underlain by a soft plinthic subsoil horizon. Fernwood soil form consist of an orthic topsoil on top of a thick albic subsoil horizon. Lastly, the Hutton soil form consist of an orthic topsoil on top of a thick deep red apedal subsoil. Refer to Figure 7.3.

The site is dominated by deep arable soils that are well aerated with a high infiltration rate. Furthermore, the area also consists of bleached soils that result from the eluviation of finer materials down the profile.

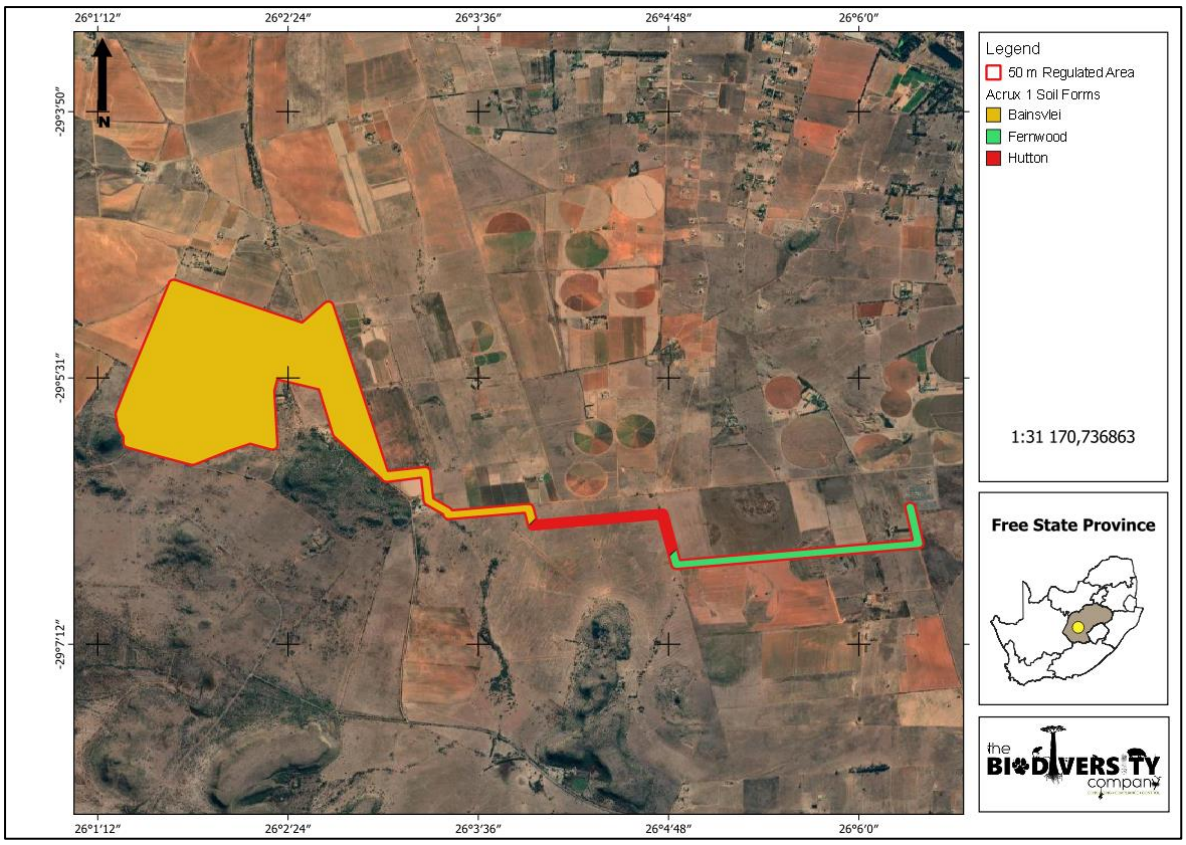


**Figure 7.3:** Soil forms identified within the Acrux Solar PV Project One site and grid connection corridor.

The Palaeontological Impact Assessment (Appendix E8) indicates that the development area is underlain by the Permian aged sediments of the Ecca (K2u, Upper Stage) in the north while the southern portion of the site is underlain by the Lower Stage (K3l) of the Beaufort Group, Karoo Series. The south-east margins of the site are underlain by Post-Karoo Dolerite. The grid connection corridor is underlain by the Lower Stage (K3l) of the Beaufort Group, Karoo Series with the western portion of both alternatives are underlain by the Post-Karoo Dolerite (red). Refer to Figure 7.4.

The updated geological map indicates that the site is underlain by the Karoo Dolerite, the Balfour Formation (Adelaide Subgroup, Karoo Supergroup) as well alluvium, colluvium, eluvium and gravel. Refer to Figure 7.5.

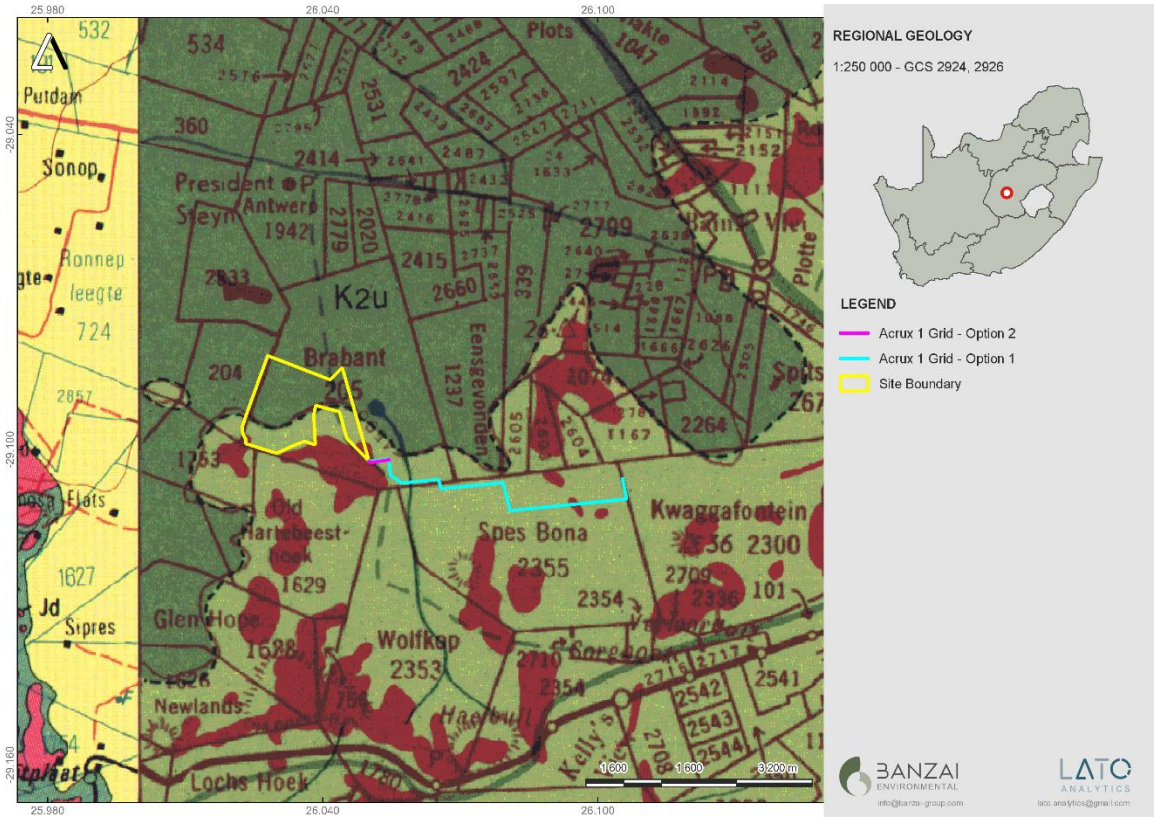


Figure 7.4: Geology associated with the Acrux Solar PV Project One site and grid connection corridor.

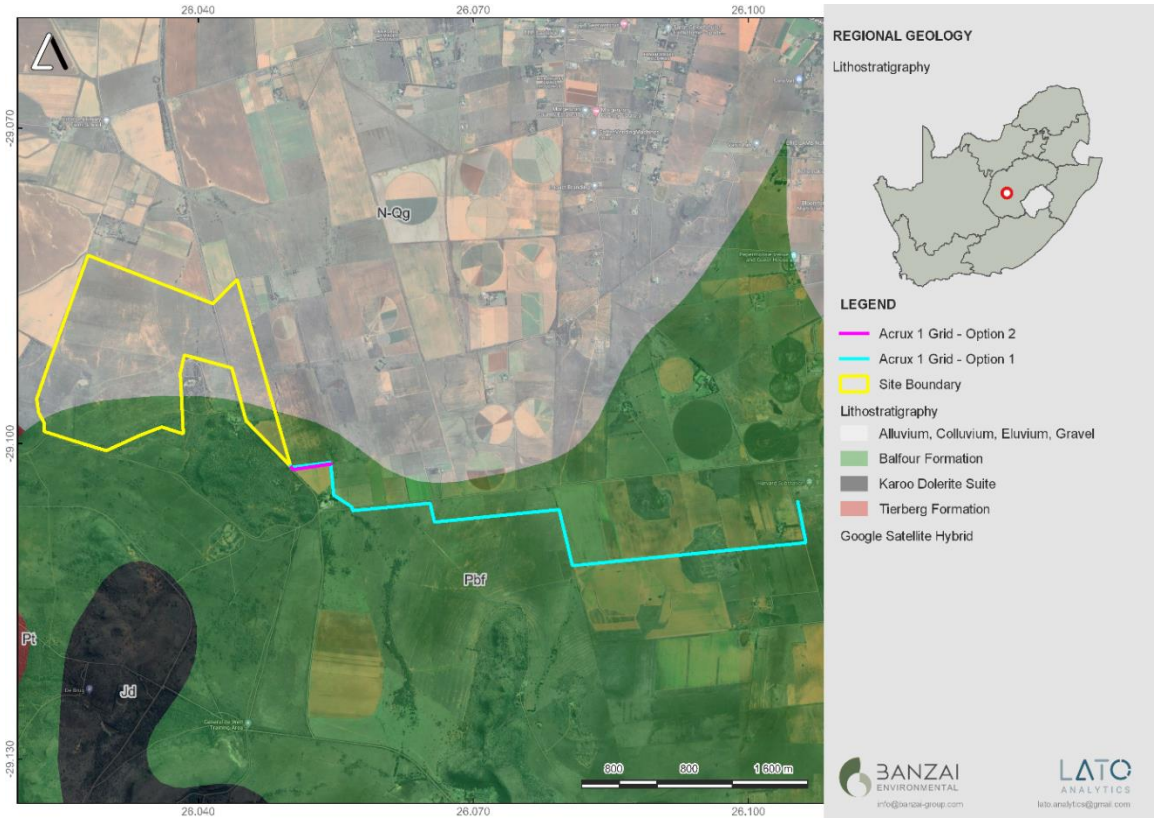


Figure 7.5: Updated geology associated with the Acrux Solar PV Project One site and grid connection corridor.

## 7.5 Land Capability and Agricultural Potential

Considering the soil forms identified within the development area (as per section 7.3) it has been determined that the soils have a land capacity class of "III" and "IV" with a climate capacity level 8 assigned due to the Low Mean Annual Precipitation (MAP) and the high Mean Annual Potential Evapotranspiration (MAPE) rates. The combination between the determined land capability class and climate capability results in land potential level "L4" and "L5".

The "L4" land potential level is characterised by moderate potential due to the moderately regular and/or severe to moderate limitations because of soil, slope, temperature, or rainfall. This area is arable, and it is characterised with a "Moderately High" sensitivity.

The "L5" land potential level is characterised by restricted land potential due to the regular and/ or moderate to severe limitations as a result because of the soil, slope, temperature, or rainfall. This area is non-arable, and it is characterised with a "Moderately Low" sensitivity.

In terms of land capabilities associated with the site and grid connection corridor the following classes are relevant:

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

The Acrux Solar PV Project One is assigned an overall "Moderate" land capability sensitivity, with small patches that are characterised by "Very low to Low" land capability sensitivity (DAFF, 2017; Figure 7.6). The land capability and land potential of the resources in the site are both characterised with "Moderate" sensitivities, which conforms to the requirements of an agricultural compliance statement only.

The site also falls within the "High" sensitivity crop field boundaries (DEA, 2023; Figure 7.6). These areas demarcated with "High" field crop boundary sensitivities were identified, indicating a "Medium - High" agricultural potential. The baseline findings and land capability sensitivity concur with each other, indicating an overall "Medium" land capability sensitivity with "Medium" agricultural land potential.

Furthermore, factors including rainfall, temperature and slope can also limit the agricultural productivity of the Acrux Solar PV Project One site. The climatic conditions that are associated with low annual precipitation and high evapotranspiration potential demand, might not be favourable for most cropping practices.

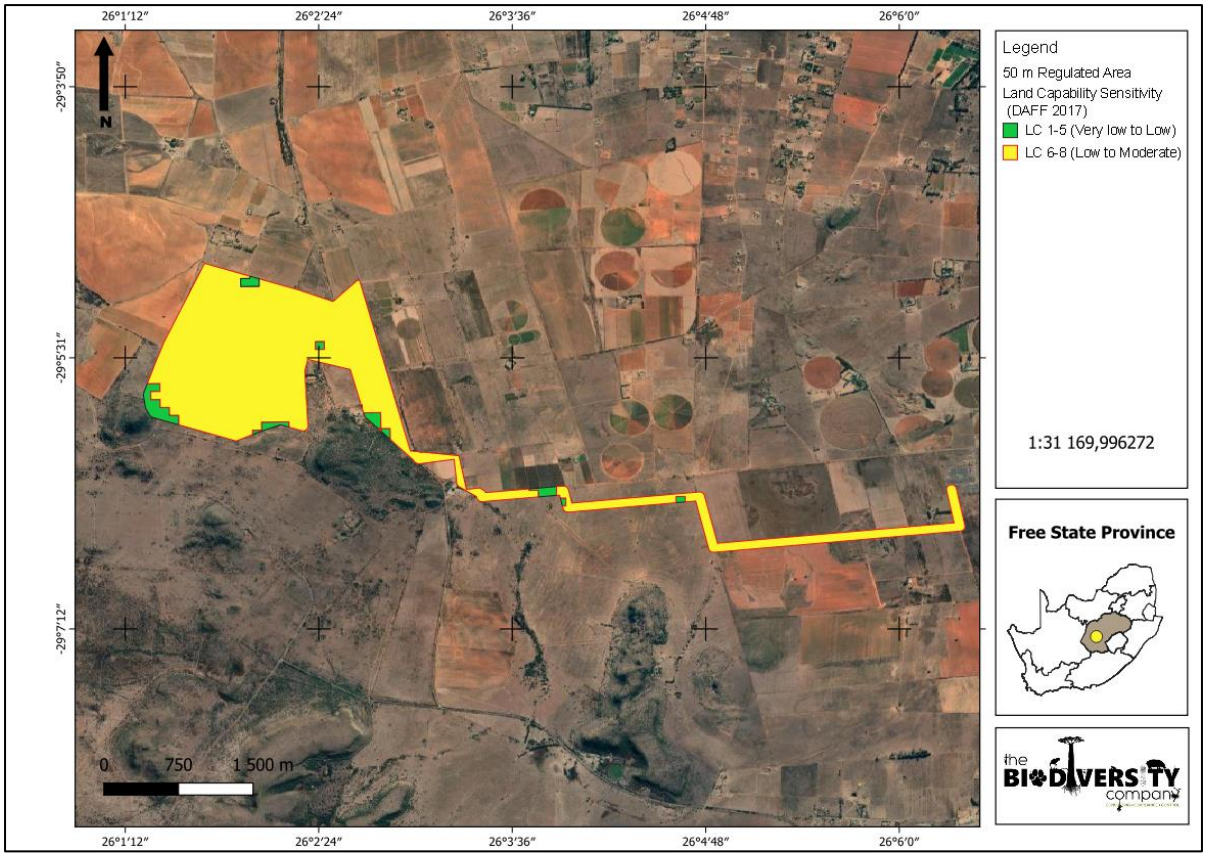


Figure 7.6: Land capability associated with the Acrux Solar PV Project One site.

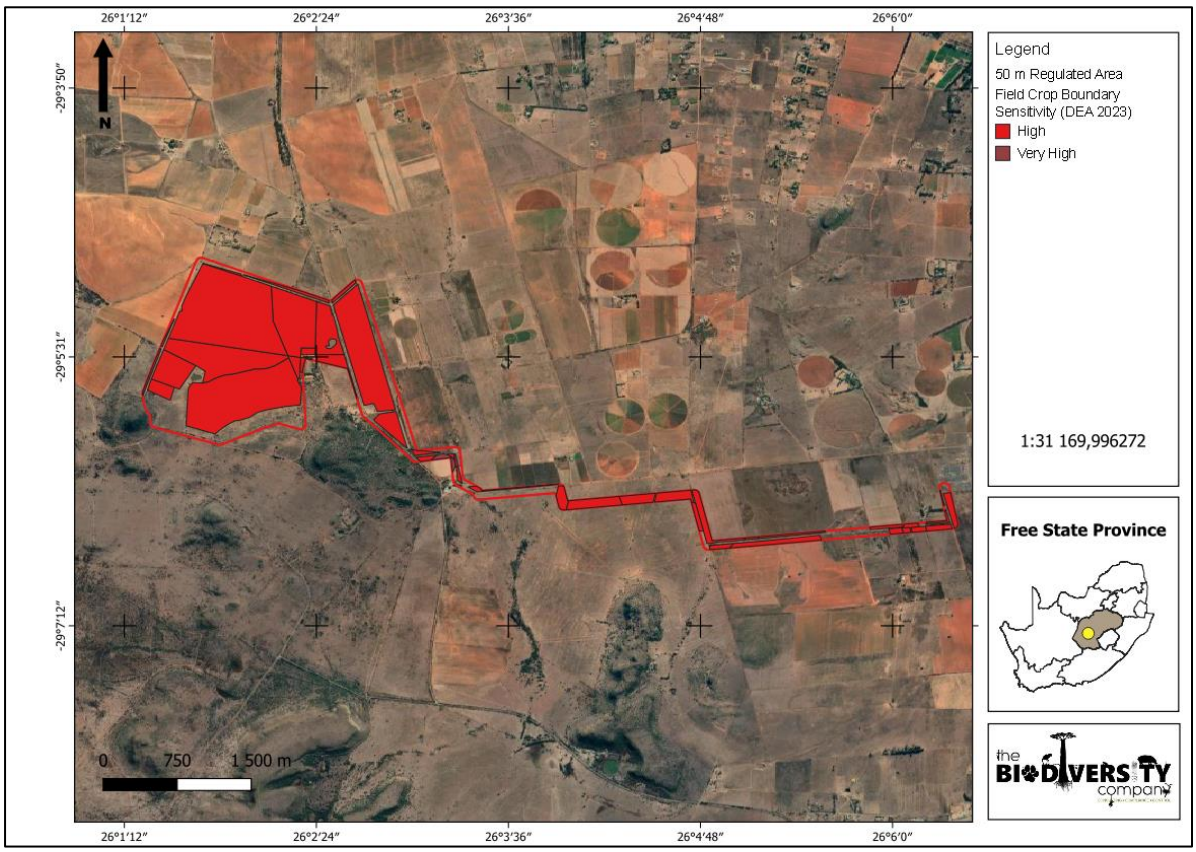


Figure 7.7: Crop field boundaries associated with the Acrux Solar PV Project One site.

## 7.6 Terrestrial Biodiversity

A Terrestrial Ecology Baseline and Impact Assessment (Appendix E1) was undertaken within included two field surveys (8th to the 12th of May and from the 29th to the 30th of June 2023). The following sub-sections describes the site from a terrestrial perspective.

### 7.6.1 Ecologically Important Landscape Features

#### *7.6.1.1 Critical Biodiversity Areas*

The Free State Province Biodiversity Plan classifies areas within the province based on 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. Provincial CBAs and ESAs are often further classified into sub-categories, such as CBA1 and CBA2 or ESA1 and ESA2.

The Acrux Solar PV Project One site overlaps with areas categorised as Degraded and Other Natural Areas. Refer to Figure 7.8 below.

#### *7.6.1.2 National Biodiversity Assessment*

According to the 2018 National Biodiversity Assessment spatial dataset the site overlaps with a 'Near Threatened' and 'Least Concern' ecosystem which is 'Poorly Protected'.

A 'Least Concern' ecosystem type is one which has experienced little or no loss of natural habitat or deterioration in condition, while a 'Near Threatened' ecosystem type is one which is close to qualifying for, or is likely to qualify for, a threatened category in the near future and 'Poorly Protected' ecosystems are those which have between five and 50% of their biodiversity target included in one or more protected areas.

Refer to Figures 7.9 and 7.10 below.

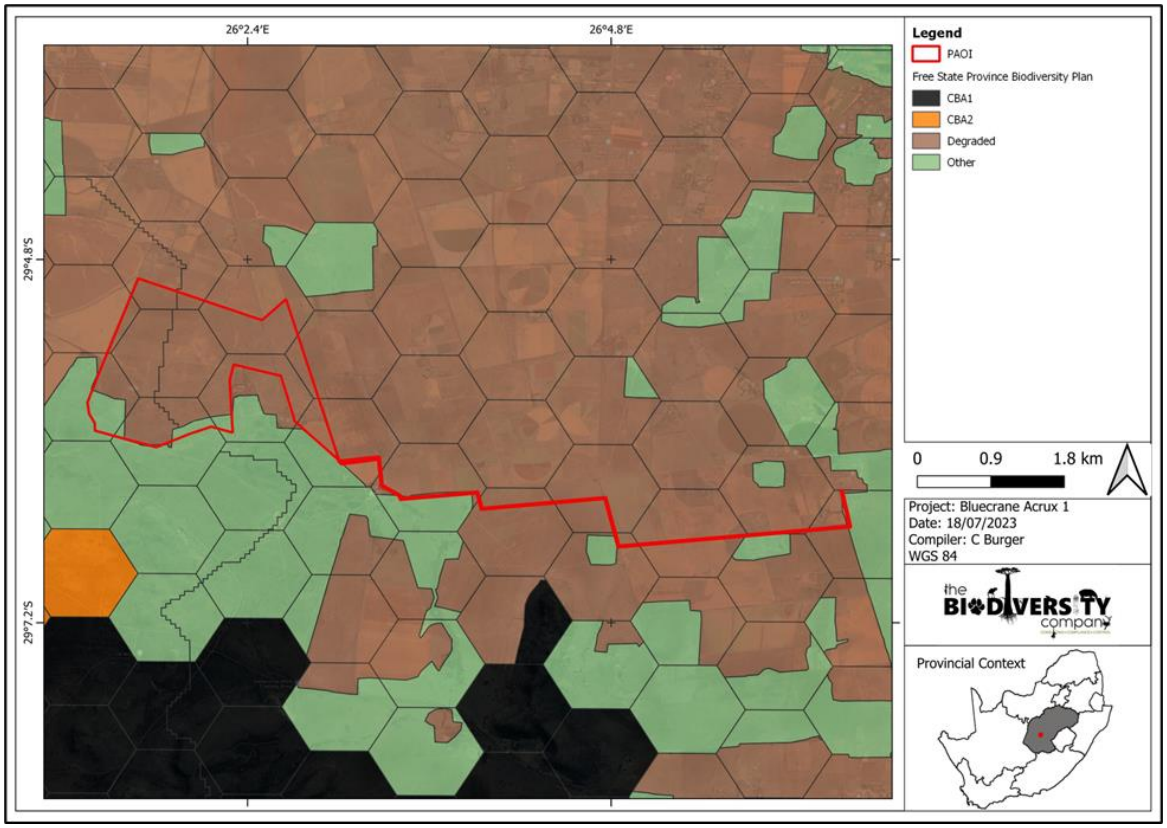


Figure 7.8: Acrux Solar PV Project One site CBA Map (no areas classified as CBA or ESA are impacted).

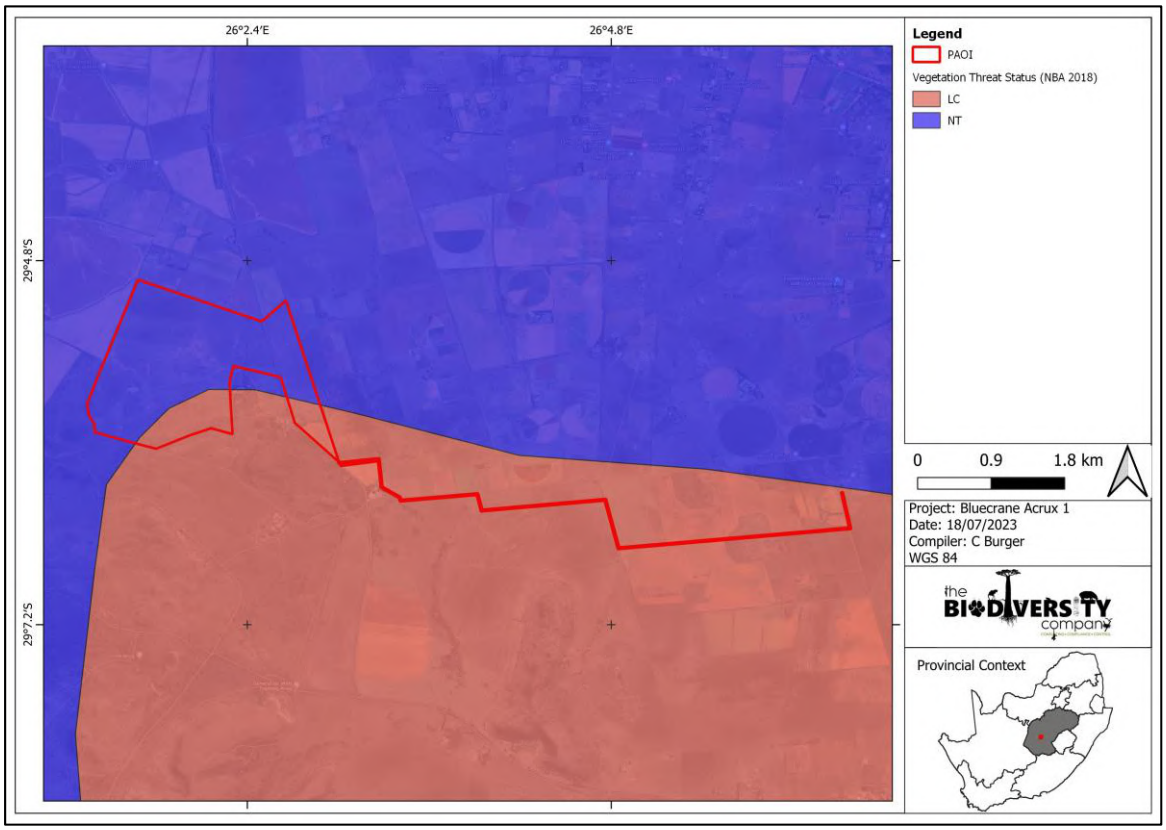


Figure 7.9: Acrux Solar PV Project One site Ecosystem Threat Status Map.

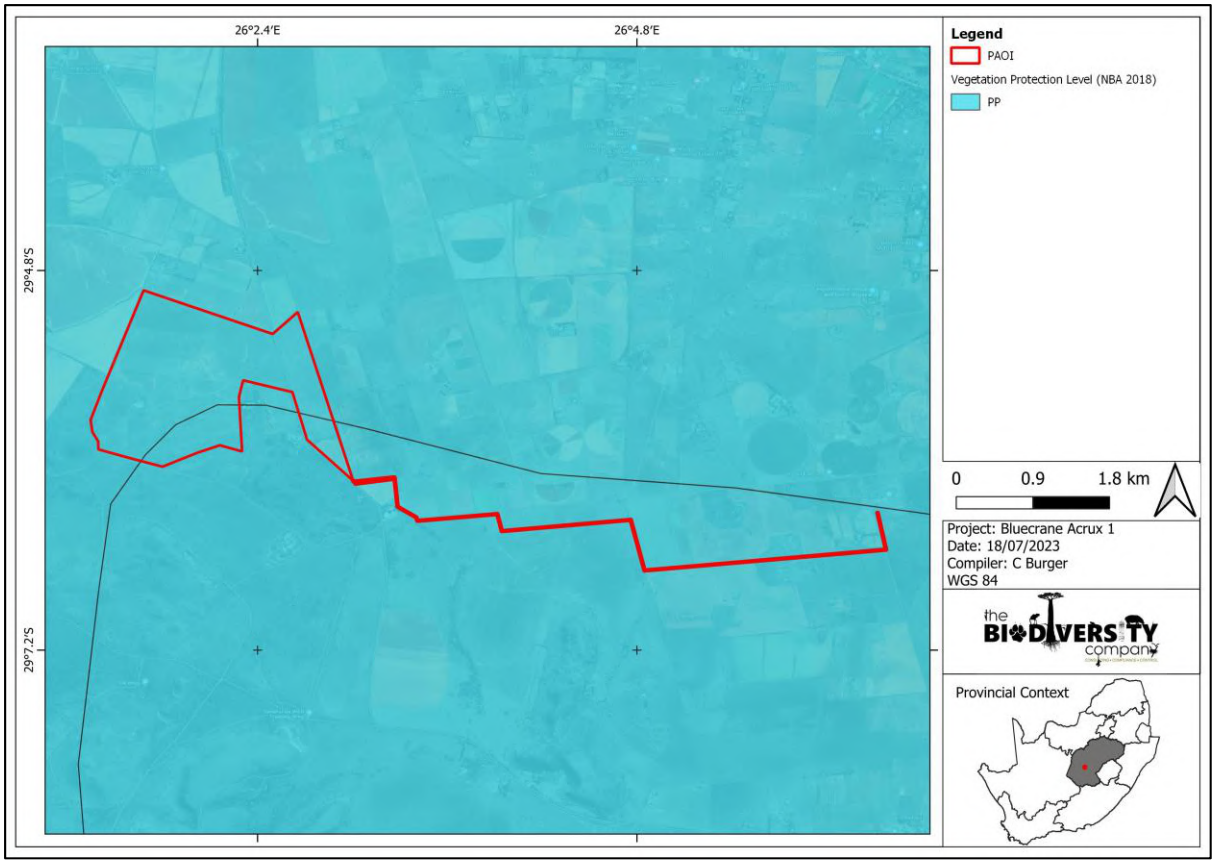


**Figure 7.10:** Acrux Solar PV Project One site Ecosystem Protection Level Map.

*7.6.1.3 Protected Areas and National Protected Areas Expansion Strategy (NPAES)*

The latest South African Protected Areas Database (DFFE, 2023) indicates that the site is located directly adjacent to the Highlands Reserve. The Reserve is located directly to the west.

It is furthermore confirmed that the Acrux Solar PV Project One site does not infringe into any National Protected Areas Expansion Strategy (NPAES) Focus Areas.

Refer to Figures 7.11 and 7.12.

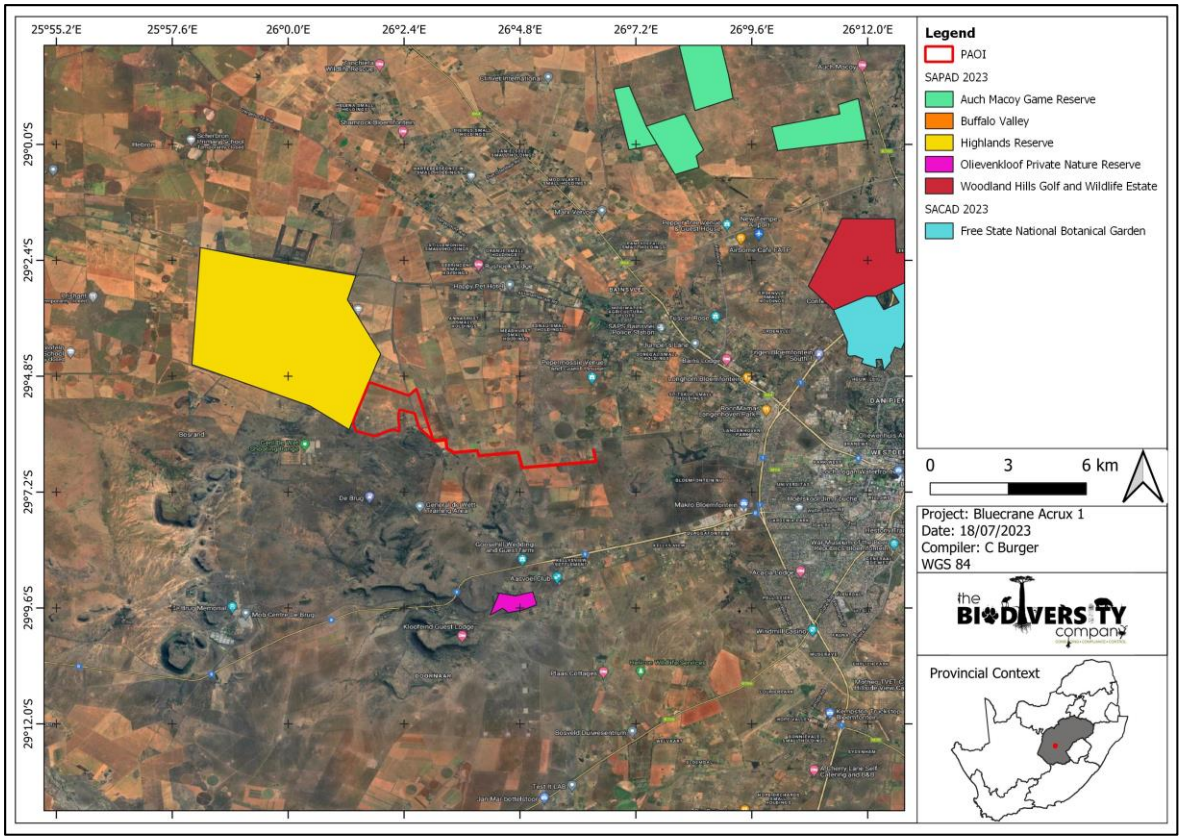


Figure 7.11: The location of the Acrux Solar PV Project One site in relation protected areas.

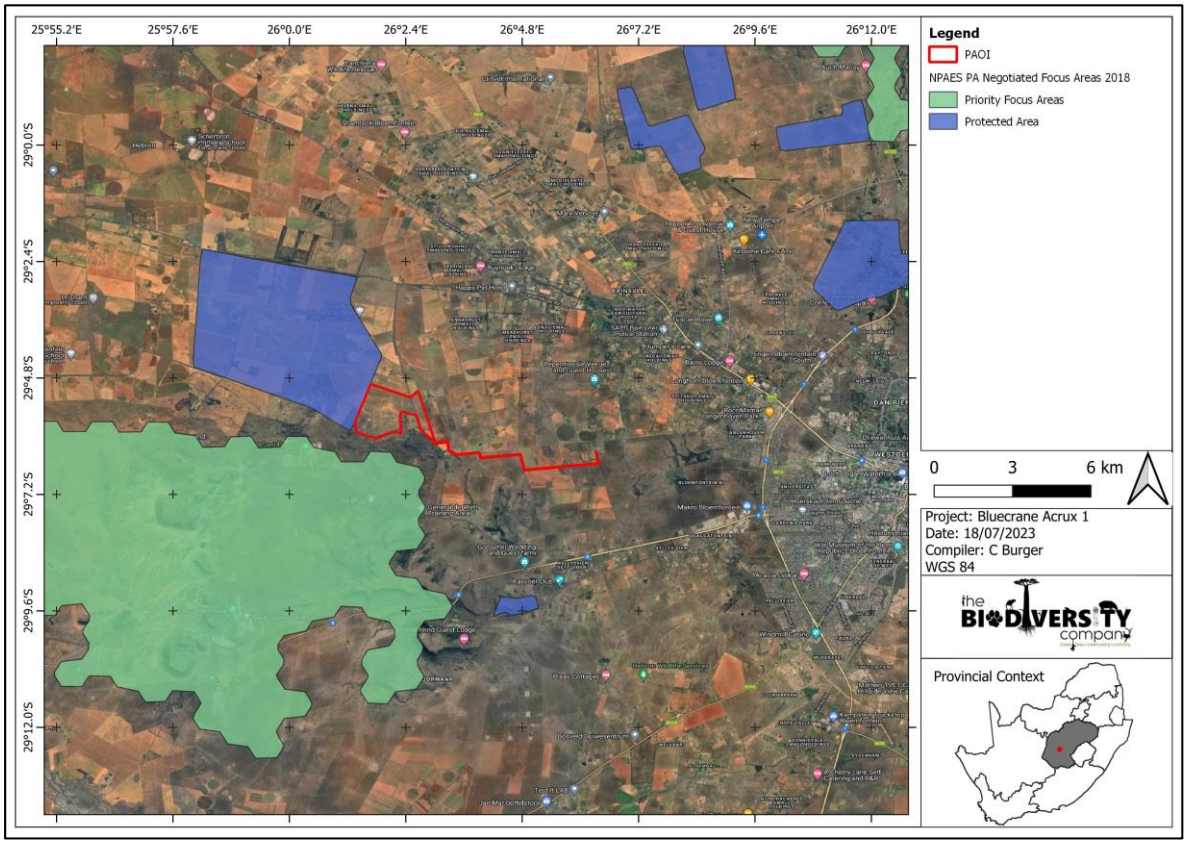


Figure 7.12: The location of the Acrux Solar PV Project One site in relation to the NPAES.

### 7.6.2 Description of the Vegetation

The Acrux solar PV Project One site is located within the Grassland Biome. 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).

The Grassland Biome is comprised of 4 parent bioregions and a total of 72 different vegetation types. The site is situated within the Winburg Grassy Shrubland and the Bloemfontein Dry Grassland. Refer to Figure 7.13.

Winburg Grassy Shrubland

This vegetation type occurs in the Free State Province on solitary hills, slopes and escarpments of mesas creating a mosaic of habitats ranging from open grassland to shrubland. Tall shrubs and sometimes small trees are sheltered against frequent periods of frost during the winter months and regular veld fires in late winter to early spring. The medium height evergreen shrublands are dominated by a combination of *Olea europaea subsp. africana, Euclea crispa subsp. crispa, Gymnosporia buxifolia, Diospyros lycioides, Searsia burchelli, S. ciliata, S. erosa* (mainly in the south), *Clutia pulchella* and *Grewia occidentalis*. Trees such as *S. lancea, Celtis africana* and *Ziziphus mucronata* are found in more deeply incised drainage lines.

This vegetation type is classified as 'Least threatened', with the national target for conservation protection being 28%. Almost 2% is statutorily conserved in the Willem Pretorius Nature Reserve and more than 10% transformed for cultivation and by urban sprawl.

Bloemfontein Dry Grassland

Bloemfontein Dry Grassland occurs within the south-central parts of the Free State, extending from Petrusburg in the west to the Rustfontein Dam in the east and from Reddersburg in the south to the Soetdoring Nature Reserve in the north. The habitat is generally characterised by a slightly undulating bottomland landscape covered with tall, dense grassland alternating with patches of karroid scrub occurring especially over calcrete.

This vegetation type is classified as 'Endangered', with the national target for conservation protection being 24%. Only a small portion is statutorily conserved in the Soetdoring Nature

Reserve and more than 40% is already transformed, e.g., for crop production as well as by urban (and related) development. Grasslands on shallow gravelly soils, as well as the low-lying areas on clayey soils, are prone to karoo-bush encroachment when overgrazed.

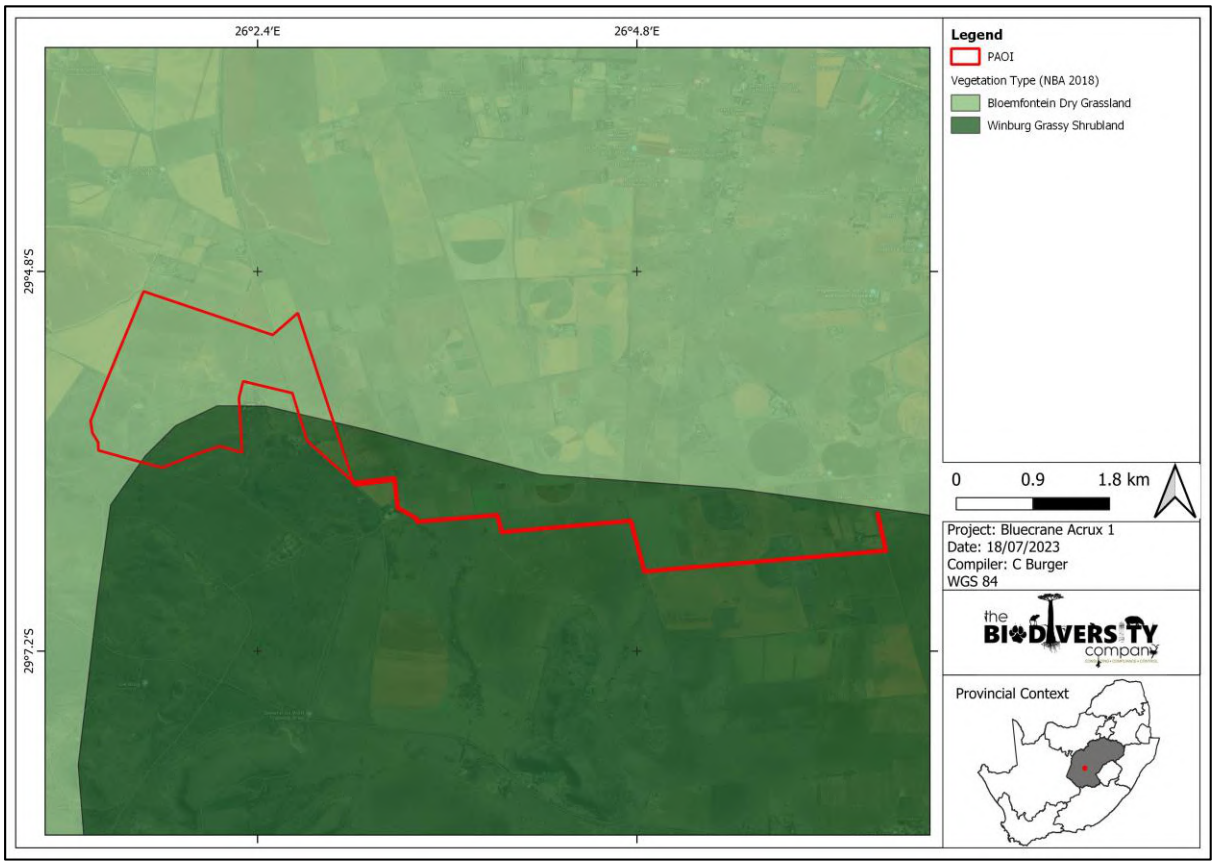


Figure 7.13: The location of the Acrux Solar PV Project One site in relation protected areas.

The POSA database indicates that over 650 species of plants could be expected to occur within and around the site. One (1) of the expected species are classified as a Species of Conservation Concern (SCC), based on their conservation status (Table 7.1). The Screening Tool indicates that one (1) flora SCC with medium sensitivity could possibly occur within the site.

Table 7.1: Species of Conservation Concern that may occur within the Acrux Solar PV Project One site.

| Family | Species | Screening Report Sensitivity | SANBI Red-List Status | Ecology | Likelihood of Occurrence |
|---|---|---|---|---|---|
| Aizoaceae | *Trichodiadema pygmaeum* | | EN | Indigenous; Endemic | Low |
| | Sensitive species 257 | Medium | VU | | Medium |

*7.6.2.1 Results of the Flora Survey*

Indigenous Flora

The landscape was entirely defined by open grassland, where pioneer grass species such as *Eragrostis chloromelas* and *Aristida congesta* dominated and only rare occurrences of climax species such as *Themeda triandra* and *Digitaria eriantha* were noted. The dominant herb species observed was *Nidorella hottentotica* and a number of shrublet species were also recorded across the area, including *Ruschia intricata*, *Chrysocoma ciliata*, *Felicia muricata subsp. muricata* and *F. filifolia*. No SCC flora species were recorded. Refer to Figure 7.14.

The provincially protected species, *Helichrysum caespititium*, were observed across the site. A permit from the Provincial Authority will be required for the removal / translocation of these species.

The specialist has recommended the undertaking of a walkthrough prior to the commencement of construction.

Invasive Alien Plants

Legislation calls for the removal and control of Category 1 Invasive Alien Plant (AIP) species. In addition, unless authorised thereto in terms of the National Water Act, no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the NEM:BA:

- Category 1a: Invasive species requiring compulsory eradication. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones. Species existing outside of a regulated area shall be classified as category 1b.

- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities: import, possess, grow, breed, move, sell, buy or accept as a gift - involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones as these will be classified as category 1b species.

Twelve (12) AIP species were recorded during the field survey, of which five (5) are Category 1b species which must be controlled through the implementation of an AIP Management Programme. Refer to Table 7.2 and Figure 7.15.

Table 7.2: Alien Invasive Plant Species recorded within the Acrux Solar PV Project One site.

| Family | Scientific Name | NEMBA Category |
|---|---|---|
| Asteraceae | *Bidens pilosa* | |
| Asteraceae | *Conyza bonariensis* | |
| Asteraceae | *Schkuhria pinnata* | |
| Asteraceae | *Tagetes minuta* | |
| Asteraceae | *Zinnia peruviana* | |
| Asteraceae | *Cirsium vulgare* | NEMBA Category 1b |
| Cactaceae | *Opuntia ficus-indica* | NEMBA Category 1b. |
| Malvaceae | *Hibiscus trionum* | |
| Papaveraceae | *Argemone ochroleuca* | NEMBA Category 1b |
| Poaceae | *Paspalum dilatatum* | |
| Solanaceae | *Solanum mauritianum* | NEMBA Category 1b |
| Verbenaceae | *Verbena bonariensis* | NEMBA Category 1b |

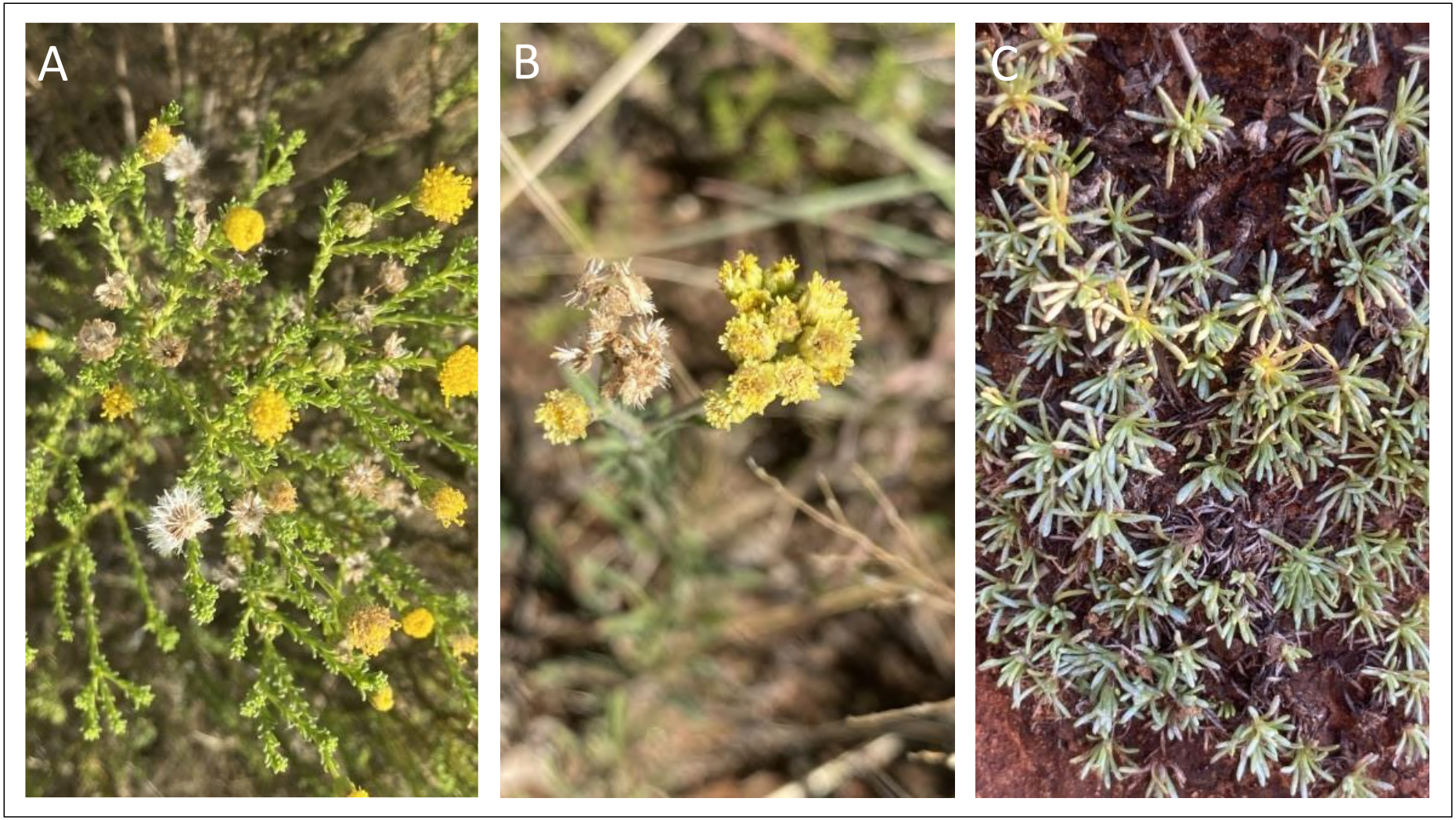


**Figure 7.14:** Indigenous flora species recorded within the Acrux Solar PV Project One site - A) *Chrysocoma ciliata*; B) *Nidorella hottentotica*; and C) *Helichrysum caespititium* (Provincially Protected).


**Figure 7.15:** Alien Invasive Plant species recorded within the Acrux Solar PV Project One site - A) *Cirsium vulgare*; B) *Bidens pilosa*; and C) *Conyza bonariensis*.

### 7.6.3 Description of the Fauna

The Terrestrial Ecology Baseline and Impact Assessment (Appendix E1) lists the expected SCC fauna species that may occur within the site. Mammals, reptiles and amphibians have been considered.

Mammals

The IUCN Red List spatial database, in addition to the MammalMap database, lists over 60 mammal species that could be expected to occur within and around the site. This excludes medium-large mammal species that are typically limited to reserves and/or protected areas. The Screening Tool indicates that one (1) SCC are predicted to occur in the site. Nine (9) of these expected species are regarded as SCC (Table 7.3), and of these SCC four (4) have a moderate likelihood of occurrence based on the presence of suitable habitat and food sources in the area.

Table 7.3: SCC mammal species that may occur within the site.

| Species | Common Name | Conservation Status | | Likelihood of Occurrence | Screening Report Sensitivity |
|---|---|---|---|---|---|
| | | SANBI | IUCN | | |
| *Aonyx capensis* | African Clawless Otter | NT | NT | Low | |
| *Eidolon helvum* | African Straw-coloured Fruit Bat | LC | NT | Low | |
| *Felis nigripes* | Black-footed Cat | VU | VU | Low | |
| *Hydrictis maculicollis* | Spotted-necked Otter | VU | NT | Low | Medium |
| *Leptailurus serval* | Serval | NT | LC | Moderate | |
| *Mystromys albicaudatus* | African White-tailed Rat | VU | VU | Moderate | |
| *Otomys auratus* | Southern African Vlei Rat (Grassland type) | NT | NT | Moderate | |
| *Parahyaena brunnea* | Brown Hyena | NT | NT | Low | |
| *Poecilogale albinucha* | African Striped Weasel | NT | LC | Moderate | |

- *Leptailurus serval* (Serval) occurs widely through sub-Saharan Africa and is commonly recorded from most major national parks and reserves (IUCN, 2017). The Serval's status outside reserves is not certain, but they are inconspicuous and may be common in suitable habitat as they are tolerant of farming practices provided there is cover and food

available. In sub-Saharan Africa, they are found in habitat with well-watered savanna long-grass environments and are particularly associated with reedbeds and other riparian vegetation types. Due to the presence of natural grassland areas in the site the likelihood of occurrence for this species is rated as moderate.

- *Mystromys albicaudatus* (White-tailed Rat) is listed as 'Vulnerable' (VU) on a regional basis as well as on a global scale. It is relatively widespread across South Africa and Lesotho and the species is known to occur in shrubland and grassland areas. A known requirement of the species is black loam soils with good vegetation cover. Although the vegetation type may be considered suitable, no black loam seems to be present in the area, therefore the likelihood of occurrence of this species is only rated as moderate.
- *Otomys auratus* (Vlei Rat) is categorised as 'Near Threatened' (NT) on a regional and global scale. This near-endemic grassland species is becoming increasingly threatened by grassland contraction and wetland loss, with niche modelling showing that it will undergo a 47-61% reduction in suitable habitat between 1975 and 2050 from climate change. The likelihood of finding this species in the site is rated as moderate.
- *Poecilogale albinucha* (African Striped Weasel) is usually associated with savanna and grassland habitats, although it likely has a wider habitat tolerance (IUCN, 2017). Road kills have been collected from areas of pastures and cultivated fields. Due to its secretive nature, it is often overlooked in many areas where it does occur. There is sufficient habitat for this species in the site and the likelihood of occurrence of this species is therefore considered to be moderate.

Reptiles

Based on the IUCN Red List spatial database and ReptileMap, over 50 reptile species may be expected to occur within and nearby to the site. Two (2) of these species are regarded as SCC and both are assigned a low likelihood of occurrence based on the lack of suitable habitat in the area (Table 7.4).

Table 7.4: SCC reptile species that may occur within the site.

| Species | Common Name | Conservation Status | | Likelihood of Occurrence |
|---|---|---|---|---|
| | | SANBI (2022) | IUCN (2021) | |
| ***Homoroselaps dorsalis*** | Striped Harlequin Snake | LC | NT | Low |
| ***Psammophis leightoni*** | Cape Sand Snake | VU | LC | Low |

Amphibians

Based on the IUCN Red List spatial database and FrogMap, over 20 amphibian species may be expected to occur within and nearby to the site. One (1) of these is regarded as an SCC and it is assigned a moderate likelihood of occurrence due to the presence of suitable wetland habitat.

The *Pyxicephalus adspersus* (Giant Bullfrog) is listed as 'Near Threatened' (NT) on a regional scale. It is a species that inhabits drier savannahs where it is fossorial for most of the year, remaining buried in cocoons. They emerge at the start of the rainy season and breed in shallow, temporary waters in pools, pans and ditches (IUCN, 2017). The presence of a wide variety of aquatic habitat within and near to the site means that this species has a moderate likelihood of occurrence.

#### *7.6.3.1 Results of the Fauna Survey*

The field survey confirmed that mammal activity was moderate, where elven (11) mammal species were recorded, either through direct observations or evidence of species. Two (2) reptile species were recorded, and one (1) amphibian species were observed during the survey (Table 7.5).

**Table 7.5:** Fauna species recorded during the field survey.

| Species | Common Name | Conservation Status | |
|---|---|---|---|
| | | SANBI | IUCN |
| | Mammals | | |
| *Canis mesomelas* | Black-backed Jackal | LC | LC |
| *Cynictis penicillata* | Yellow Mongoose | LC | LC |
| *Genetta genetta* | Small-spotted Genet | LC | LC |
| *Geosciurus inauris* | Cape Ground Squirrel | LC | LC |
| *Hystrix africaeaustralis* | Cape Porcupine | LC | LC |
| *Lepus saxatilis* | Scrub Hare | LC | LC |
| *Orycteropus afer* | Aardvark | LC | LC |
| *Phacochoerus africanus* | Common Warthog | LC | LC |
| *Raphicerus campestris* | Steenbok | LC | LC |
| *Suricata suricatta* | Suricate | LC | LC |
| *Sylvicapra grimmia* | Common Duiker | LC | LC |
| | Reptiles | | |
| *Pachydactylus capensis* | Cape Gecko | LC | Unlisted |
| *Stigmochelys pardalis* | Leopard Tortoise | LC | LC |

| | | | |
|---|---|---|---|
| | Amphibians | | |
| *Amietia delalandii* | Delalande's river frog | LC | LC |

### 7.6.4 Habitat Identification

As part of the Terrestrial Ecology Baseline and Impact Assessment (Appendix E1) main habitat types within the Acrux Solar PV Project One site have been delineated. These were delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the survey. Four habitats were delineated in total, and these are mapped in Figure 7.16 and described in Table 7.6 below.

**Table 7.6:** Habitat delineation associated with the Acrux Solar PV Project One site.

| Secondary Grassland | |
|---|---|
| Description: | • Exposed to modifications due to land use and mismanagement but differs from the degraded grassland in the extent of disturbance that has taken place.<br>• Dominant species: *Ruschia intricata, Chrysocoma ciliata, Felicia muricata subsp. muricata* and *F. filifolia, Themeda triandra, Eragrostis chloromelas, Selago densiflora, Geigeria burkei* and *Nidorella hottentotica.* |
| Site Ecological Importance (SEI): | • Regarded as important.<br>• Functions as remaining natural habitat<br>• Supports viable plant species populations including provincially protected species.<br>• Serves as a movement corridor for fauna; and is used for foraging.<br>• SEI rating: Medium |
|  | |

| Degraded Grassland | |
|---|---|
| Description: | • Historical vegetation clearing for agricultural practices has led to alterations of the natural grassland habitat.<br>• Current grazing and ongoing human infringement are still impacting the unit.<br>• Dominant species: *Aristida congesta, Cynodon dactylon, Eragrostis chloromelas, Hyparrhenia hirta.*<br>• Alien Invasive Species: *Tagetes minuta, Verbena bonariensis, Gomphocarpus physocarpus* and *Erigeron bonariensis.* |
| Site Ecological Importance (SEI): | • Still serves as a movement corridor for faunal species.<br>• SEI rating: Low (terrestrial) and Medium (avifauna) |
|  | |
| Water Resources | |
| Description: | • The ecological integrity, importance and functioning of these areas play a crucial role as a water resource system and an important habitat for various fauna and flora.<br>• These areas are likely to serve as an important movement corridor, foraging and possible nesting resource for local fauna. |
| Site Ecological Importance (SEI): | • The preservation of these systems is an important aspect to consider for the proposed development.<br>• SEI rating: High |

| Modified | |
|---|---|
| Description: | • No natural vegetation types are present within this habitat type.<br>• Some indigenous species may occur, but these tend to be pioneer species.<br>• Alien and invasive vegetation as well as crops dominate these areas.<br>• This predominantly includes areas previously or actively utilised for agricultural practices. |
| Site Ecological Importance (SEI): | SEI rating: Very Low |

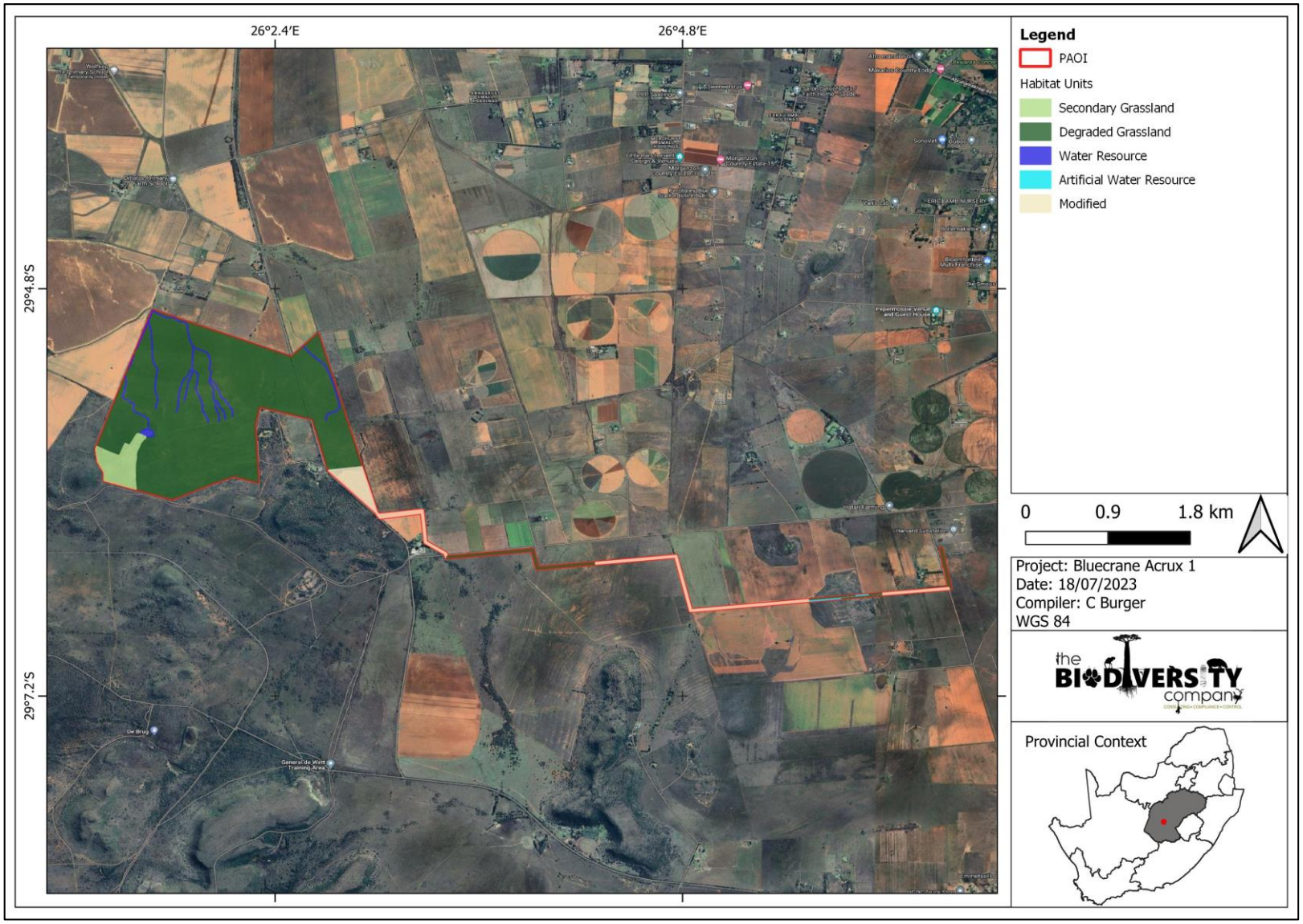


**Figure 7.16:** Habitat units identified within the Acrux Solar PV Project One site.

## 7.7 Aquatic Biodiversity

A Wetland Baseline and Risk Assessment (Appendix E2) has been undertaken for the Acrux Solar PV Project One site.

Existing datasets have been considered by the independent specialist in this regard, which includes:

1. South African Inventory of Inland Aquatic Ecosystems

   The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) wetland dataset is a recent outcome of the National Biodiversity Assessment (NBA, 2018) and, was a collaborative project by the South African National Biodiversity Institute (SANBI) and the Council for Scientific and Industrial Research (CSIR). The SAIIAE dataset provides further insight into wetland occurrences and extents building on the information from the NFEPA, as well as other datasets. No wetlands were identified within the site by means of this dataset.

2. National Freshwater Ecosystem Priority Areas Wetlands

   The National Freshwater Ecosystem Priority Areas (NFEPA) database forms part of a comprehensive approach to the sustainable and equitable development of South Africa's scarce water resources. This database provides guidance on how many rivers, wetlands and estuaries, and which ones, should remain in a natural or near-natural condition to support the water resource protection goals of the National Water Act (Act 36 of 1998) (NWA).

   Two wetland types have been identified to be relevant to Acrux Solar PV Project One, namely seepages and wetland flats (Figure 7.17). The wetland flat areas are known to be dams, whereas the seepage wetlands refer to artificial water reservoirs located within the site. The above-mentioned wetlands have "Z3" wetland conditions which refer to extensively modified areas where the natural land cover is less than 25%.

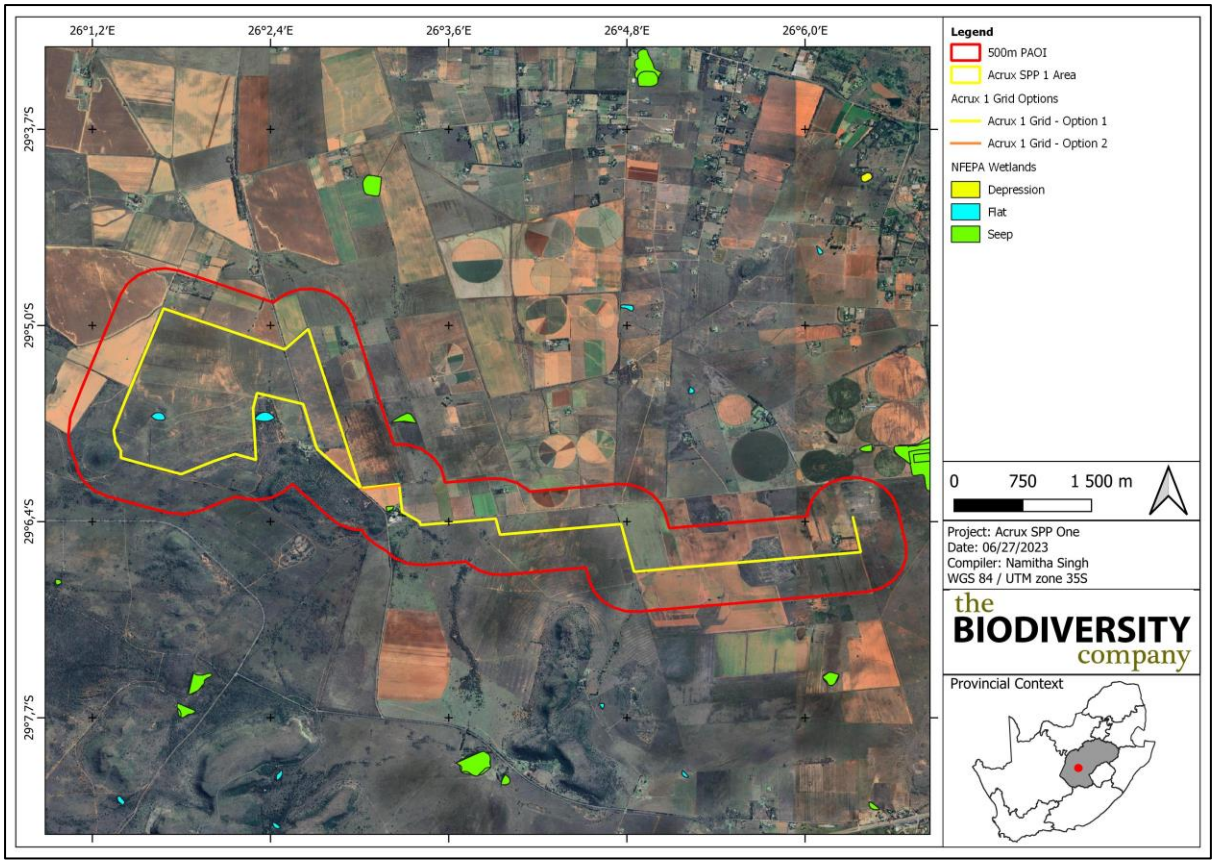


**Figure 7.17:** NFEPA wetlands associated with Acrux Solar PV Project One.

Further to the above, the topographical inland and river line data for "2926" quarter degree was used to identify potential wetland areas within the site. This data set indicates four inland water areas of which two were classified as being large reservoirs and, two as dams. Furthermore, several non-perennial drainage features were identified within the site, a few of which intersect the development footprint of Acrux Solar PV Project One. Refer to Figure 7.18 below.

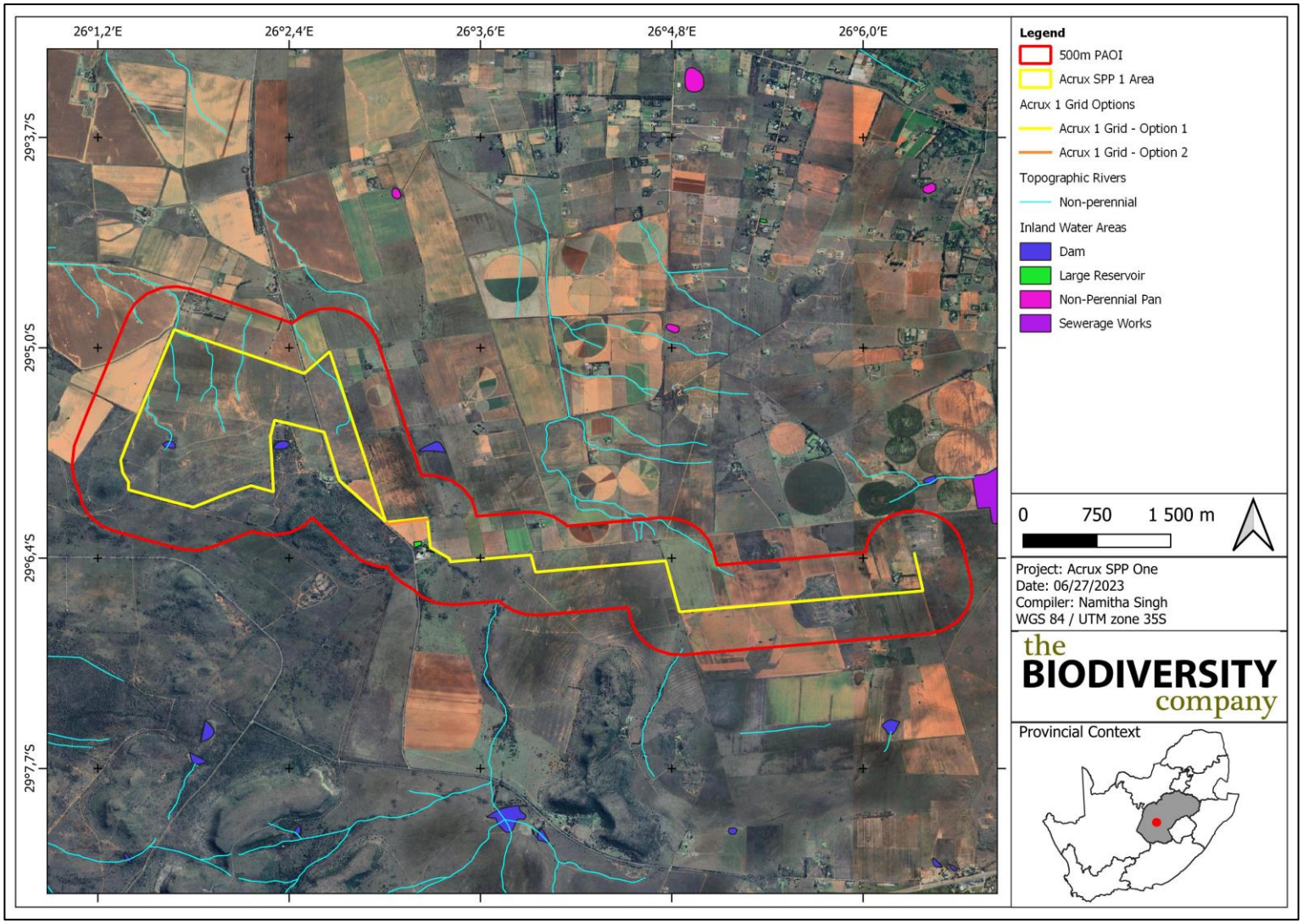


Figure 7.18: Topographical lines and inland water areas associated with the Acrux Solar PV Project One site.

The wetland specialist undertook a site visit in May of 2023 with the objective of delineating the different types of wetland present on site. The delineation was undertaken in line with the Department of Human Settlements, Water and Sanitation guidelines and recommended suitable buffer zones (DWA, 2008), in conjunction with the available satellite imagery.

The wetlands identified have been grouped into different hydrogeomorphic (HGM) units based on their topographic setting, spatial proximity, and overall similarity.

Three (3) HGM units were identified within the 500 m regulated area of Acrux Solar PV Project One. HGM 1 and 3 were classified as depression wetlands, whilst HGM 2 consisted of three seepage wetlands. HGM 1 was the only wetland within the development area of Acrux Solar PV Project One, located in the southwest region of the site. HGM 2 is located within the regulated area of the proposed grid connection corridor but is not intersected by the grid route / corridor itself. HGM 3 is located within the PAOI of the proposed grid connection corridor a considerable distance away from the route / corridor itself. The focus of Wetland Baseline and Risk Assessment Report (Appendix E2) was therefore HGM 1 and HGM 2, as HGM 3 will likely only experience insignificant indirect impacts, if any. Refer to Figure 7.19.

Apart from the wetlands, several drainage features were identified within the regulated area, including the development area and footprint of Acrux Solar PV Project One. Some of these features were classified as non-perennial systems and others were classified as preferential flow paths within cropland areas. Some of the features were distinctly channelled whilst others displayed topographic homogeneity with the surrounding grassland landscapes. No hydrophytes were observed in the drainage features during the site survey, however the presence of sedges and hydrophytic grasses throughout these systems cannot be ruled out completely. Terrestrial grasses were common in the drainage areas of the development area. Many of these features have suffered impacts from the historical agricultural land use and several of them display erosion on their banks. Most of the features were dry during the time of survey, apart from the larger and deeper systems.

Additionally, one dam weas identified within the development area. Other artificial areas included a seepage wetland located in the northeast section of the regulated area of the grid connection corridor and a historically disturbed area that the corridor intersects. The disturbed area was mapped via desktop and had not been verified on field, although from the available satellite imagery it is expected that artificial depression areas that present wetland conditions are located within the disturbed area because of previous earthmoving and excavation activities.

Furthermore, three small artificial areas of wetness within the regulated area of the grid connection corridor were identified and are likely a result of changes in surface topography through historical land use. These areas are currently topographically suited to accumulate runoff following rainfall and have established hydrophytic sedges.

In terms of wetland indicators, the following was ground – truthed:

- *Hydrophytic Vegetation* – Several hydrophytic species were observed within the wetland areas. The dominant vegetation within the wetlands were sedges and grasses. The sedges commonly encountered were from the Cyperus and Schoenoplectus genus along with several grasses from the Aristida, Eragrostis and Diplachne genus. Furthermore, grass species from the Hyparrhenia genus dominated the drainage areas within the crop fields.
- *Hydromorphic Soils* – The common soil forms identified within the wetland areas were Katspruit and Rensburg. Katspruit consists of an orthic topsoil horizon overlaying a diagnostic G subsoil horizon. The Rensburg soil form consists of a vertic topsoil overlaying a diagnostic G subsoil horizon. Vertic topsoils are characterised by a high clay content which promotes shrinkage and swell during dry and wet periods, respectively.

Refer to Figure 7.20.

The wetlands within the HGM units were relatively small which contributes to the limitations in service provision. HGM 1 was an isolated depression which did contain water but is fed by the runoff from the immediate surroundings which will contribute to high seasonal fluctuations in service provision. Furthermore, the wetland was not densely vegetated with hydrophytes which also limits its potential to provide water purification and carbon storage on a significant level. Services provided by HGM 1 include flood attenuation, sediment trapping and erosion control on a minor scale. HGM 2 were seepage wetlands with a significant number of hydrophytes for the wetlands relatively small size. The services provided here are similar to that of HGM 1 with a slight increase in water purification capability. However, all the services provided will likely still occur on a limited scale.

The wetlands are located within private property which limits public access therefore both units cannot contribute to cultural heritage and tourism. Furthermore, the type of vegetation within the wetlands limit usage as harvestable resources and cultivated foods. The water that collects within the depression wetland may serve as a water source for visiting fauna, although on a limited basis.

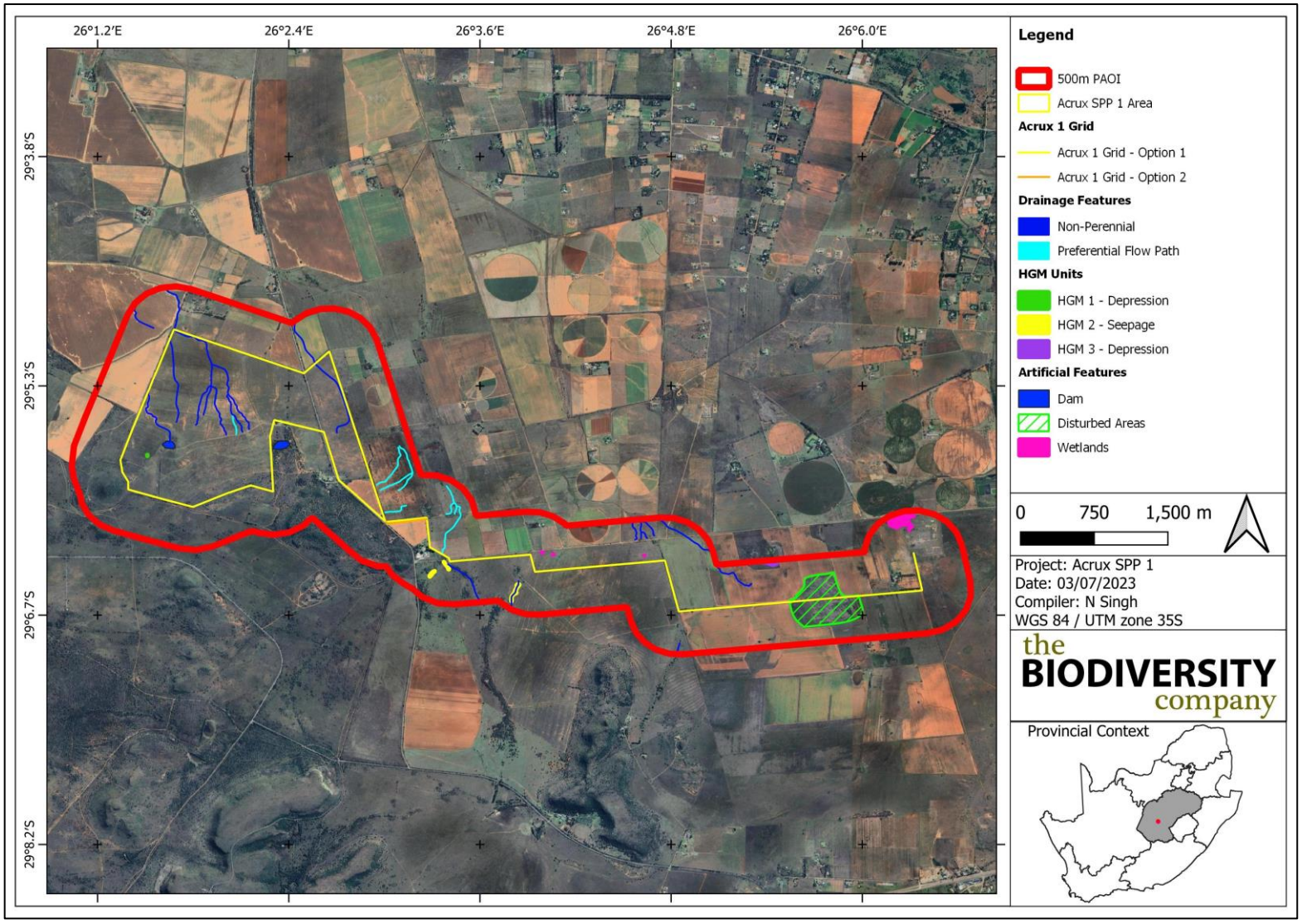


**Figure 7.19:** Delineation and location of different wet areas associated with the Acrux Solar PV Project One site.

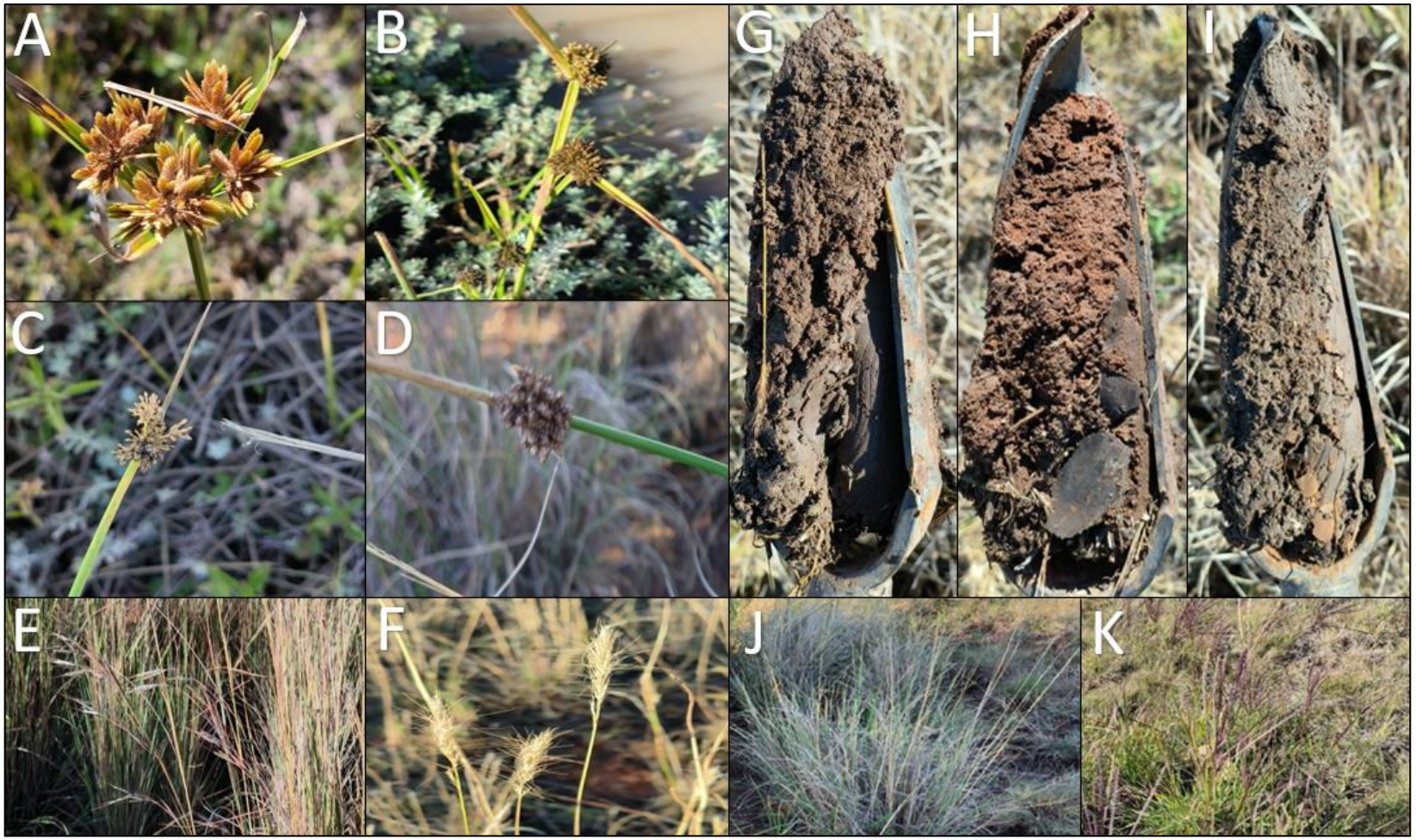


**Figure 7.20:** Wetland indicators identified within the site - A, B, C) Hydrophytic sedges from the *Cyperus* genus, D) *Schoenoplectus spp.*, E) *Hyparrhenia spp.*, F & K) *Aristida spp.*, G) Vertic topsoil, H) Orthic topsoil with mottling, I) Gleyed subsoil, J) *Diplachne spp.*

## 7.8 Avifauna Assessment

An Avifauna Impact Assessment (Appendix E3) has been undertaken in line with the BirdLife South Africa guidelines for Solar Development. The field survey area and locations are included in Figure 7.21 below.

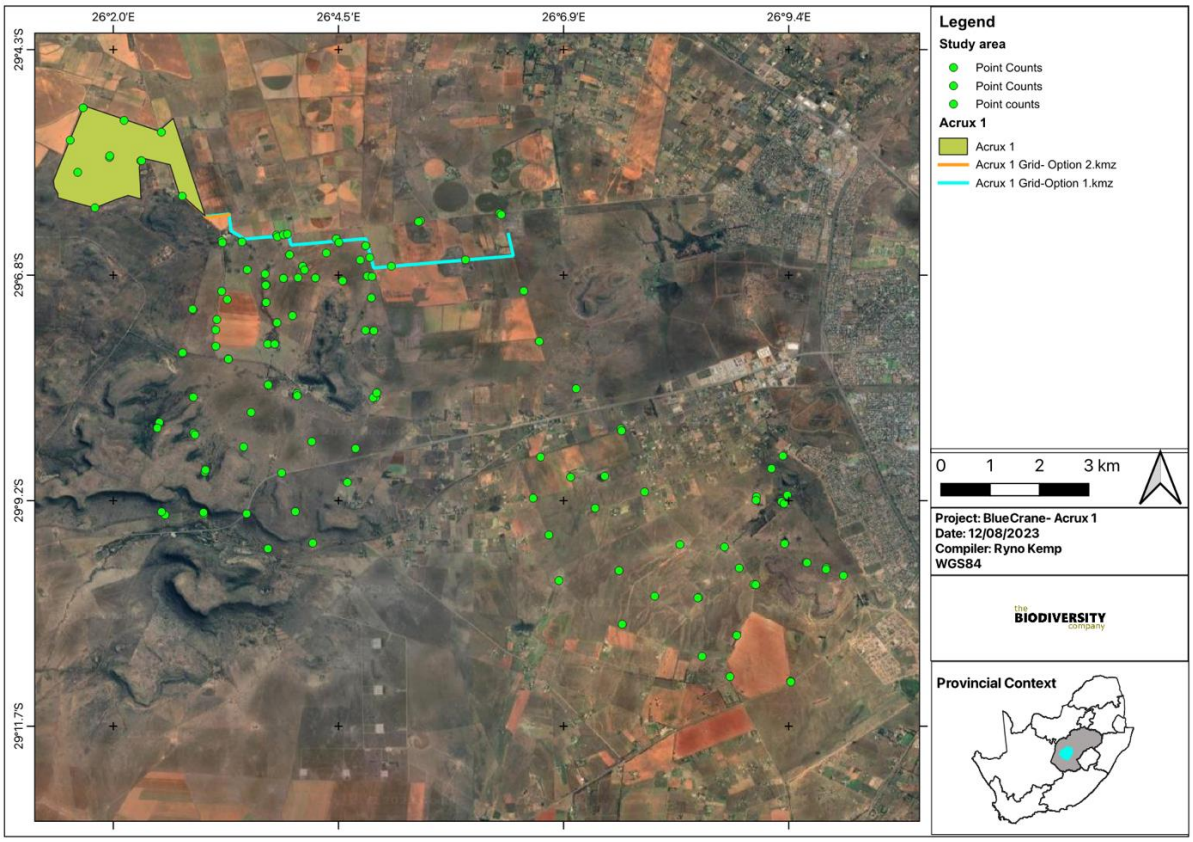


**Figure 7.21:** Field survey area and locations surveyed as part of the Avifauna Impact Assessment.

### 7.8.1 Expected Species of Conservation Concern (SCC)

The SABAP2 Data lists 411 indigenous avifauna species that could be expected to occur within the site and surrounding landscape. Twenty-four of these expected species are regarded as SCC (Table 7.7).

Table 7.7: Expected avifauna Species of Conservation Concern that are expected to occur within the site and surrounding areas. *CR = Critically Endangered, EN = Endangered, LC = Least Concern, NT = Near Threatened and VU = Vulnerable

| Common Name | Scientific Name | Regional* | Global+ | Likelihood of Occurrence |
|---|---|---|---|---|
| Blue Crane | *Anthropoides paradiseus* | NT | VU | Moderate |
| African Rock Pipit | *Anthus crenatus* | NT | LC | Confirmed |
| Tawny Eagle | *Aquila rapax* | EN | VU | Low |
| Verreaux's Eagle | *Aquila verreauxii* | NT | LC | Moderate |
| Kori Bustard | *Ardeotis kori* | NT | NT | High |
| Curlew Sandpiper | *Calidris ferruginea* | LC | NT | Moderate |
| Abdim's Stork | *Ciconia abdimii* | NT | LC | Low |
| Pallid Harrier | *Circus macrourus* | NT | NT | Moderate |
| Black Harrier | *Circus maurus* | EN | EN | Moderate |
| African Marsh Harrier | *Circus ranivorus* | EN | LC | High |
| European Roller | *Coracias garrulus* | NT | LC | Low |
| Blue Korhaan | *Eupodotis caerulescens* | LC | NT | Confirmed |
| Lanner Falcon | *Falco biarmicus* | VU | LC | Confirmed |
| Red-footed Falcon | *Falco vespertinus* | NT | VU | Moderate |
| Ground Woodpecker | *Geocolaptes olivaceus* | LC | NT | High |
| Black-winged Pratincole | *Glareola nordmanni* | NT | NT | Moderate |
| Yellow-billed Stork | *Mycteria ibis* | EN | LC | Low |
| Ludwig's Bustard | *Neotis ludwigii* | EN | EN | High |
| Maccoa Duck | *Oxyura maccoa* | NT | EN | Low |
| Lesser Flamingo | *Phoeniconaias minor* | NT | NT | Low |
| Greater Flamingo | *Phoenicopterus roseus* | NT | LC | Low |
| Martial Eagle | *Polemaetus bellicosus* | EN | EN | Low |
| Greater Painted-snipe | *Rostratula benghalensis* | NT | LC | Moderate |
| Secretarybird | *Sagittarius serpentarius* | VU | EN | Confirmed |

### 7.8.2 Results of the Field Surveys

Two site visits were conducted for this regime 2 assessment. The first was conducted in late summer, over 2 days with 2 observers from the 17th to the 18th of April 2023, and the second, during winter, over 5 days from the 17th to the 21st of July 2023. These two site visits are considered sufficient from a seasonal perspective and require no additional seasonal surveys. The total number of individual species accounts for approximately 31.1% of the total number of expected species.

#### *7.8.2.1 Risk Species*

Priority Species are considered threatened, rare or prone to impacts from energy development (Ralston Paton et al, 2017). Twenty-two (22) species observed within the site and surrounding area are considered priority species (Table 7.8).

Table 7.8: Summary of Priority Species recorded within and around the proposed development.

| Common Name | Scientific Name | Sources | Collision | Electrocution | Disturbance/Habitat Loss |
|---|---|---|---|---|---|
| Black Sparrowhawk | *Accipiter melanoleucus* | X | X | X | |
| Black-headed Heron | *Ardea melanocephala* | O | X | X | |
| Black-winged Kite | *Elanus caeruleus* | X | X | X | |
| Egyptian Goose | *Ardea cinerea* | O | X | X | |
| Greater Kestrel | *Bostrychia hagedash* | X | X | X | |
| Grey Heron | *Turdus smithi* | O | X | X | |
| Lanner Falcon | *Cisticola tinniens* | X | X | X | |
| Pale Chanting Goshawk | *Streptopelia capicola* | X | X | X | |
| Reed Cormorant | *Emarginata sinuata* | O | X | X | |
| Rock Kestrel | *Lanius collaris* | O | X | X | |
| Secretarybird | *Bubo africanus* | X | X | X | X |
| South African Shelduck | *Plectropterus gambensis* | O | X | X | |
| Spotted Eagle-Owl | *Cisticola juncidis* | X | X | X | |
| Spur-winged Goose | *Afrotis afraoides* | O | X | X | |
| White-breasted Cormorant | *Scleroptila gutturalis* | O | X | X | |
| Northern Black Korhaan | *Quelea quelea* | X | X | X | X |
| Blue Korhaan | *Lybius torquatus* | X | X | X | X |

| | | | | | |
|---|---|---|---|---|---|
| **Yellow-billed Duck** | *Anthus crenatus* | O | X | X | |
| **White-faced Whistling Duck** | *Rhinoptilus africanus* | O | X | X | |
| **African Rock Pipit** | *Rhinoptilus africanus* | X | X | X | X |
| **Double-banded Courser** | *Rhinoptilus africanus* | X | | | X |
| **Marsh Owl** | *Rhinoptilus africanus* | X | X | X | X |

#### *7.8.2.2 Dominant Species*

Table 7.9 provides the relative abundance of the dominant species as well as the frequency with which each species appeared in the point count samples. The most abundant species was the Quelea quelea (Red-billed Quelea), with a relative abundance of 0.178 and a frequency of occurrence of 18.881%. Additional ubiquitous species was *Streptopelia capicola* (Ring-necked Dove). No distinct seasonal differences were observed.

**Table 7.9:** Relative abundance and frequency of occurrence of dominant avifauna species recorded during the standardised point counts.

| Common Name | Scientific Name | Relative abundance | Frequency |
|---|---|---|---|
| **Red-billed Quelea** | *Quelea quelea* | 0.178 | 18.881 |
| Helmeted Guineafowl | *Numida meleagris* | 0.157 | 24.476 |
| Speckled Pigeon | *Columba guinea* | 0.062 | 18.881 |
| Ring-necked Dove | *Streptopelia capicola* | 0.051 | 65.734 |
| Cape Sparrow | *Passer melanurus* | 0.045 | 18.881 |
| Black-chested Prinia | *Prinia flavicans* | 0.034 | 48.252 |
| Egyptian Goose | *Alopochen aegyptiaca* | 0.033 | 7.692 |
| African Red-eyed Bulbul | *Pycnonotus nigricans* | 0.027 | 34.266 |
| White-browed Sparrow-Weaver | *Plocepasser mahali* | 0.026 | 28.671 |
| Quailfinch | *Ortygospiza atricollis* | 0.020 | 27.273 |
| Red-faced Mousebird | *Urocolius indicus* | 0.019 | 12.587 |
| Yellow Canary | *Crithagra flaviventris* | 0.017 | 8.392 |
| Chestnut-vented Warbler | *Curruca subcoerulea* | 0.017 | 32.867 |
| Acacia Pied Barbet | *Tricholaema leucomelas* | 0.015 | 32.867 |
| Bokmakierie | *Telophorus zeylonus* | 0.015 | 25.175 |
| African Pipit | *Anthus cinnamomeus* | 0.013 | 23.077 |
| Laughing Dove | *Spilopelia senegalensis* | 0.012 | 19.580 |
| Northern Black Korhaan | *Afrotis afraoides* | 0.012 | 21.678 |
| Ant-eating Chat | *Myrmecocichla formicivora* | 0.011 | 17.483 |
| Southern Fiscal | *Lanius collaris* | 0.011 | 25.175 |

The impact assessment indicates that the species composition during the survey was dominated by invertivores, birds that feed on the ground during the day. Followed by Granivores.

#### *7.8.2.3 Flight and Nest Analysis*

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

No specific flight paths were noted. No confirmed nest sites of SCC have been recorded during the field investigation; this is mainly attributed to the point count analysis protocol, which allows for accurate sampling of the avifauna but does not exhaustively cover the site locating nests.

#### *7.8.2.4 Fine-Scale Habitat Identification*

The main habitat types identified across the area were initially delineated largely based on aerial imagery, and these main habitat types were then refined based on the field coverage and data collected during the surveys.

Emphasis was placed on limiting timed meander searches within the most functional habitats, and therefore habitats with a higher potential of hosting SCC.

The four habitats delineated in terms of avifauna which include secondary grassland, degraded grassland, water resources and modified areas. Refer to section 7.6.4 for more information in this regard.

### 7.9 Visual Consideration

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

A Visual Impact Assessment (Appendix E5) has been undertaken for Acrux Solar PV Project One.

### 7.9.1 Sensitive Visual Receptors

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 | o A large number of smallholdings.<br>o Bloemfontein and associated suburbs, including Quaggafontein.<br>o General De Wet Shooting Range.<br>o De Brug Military Base. |
| Linear Receptors | o N1 National Road.<br>o N8 National Road adjacent to the SEF.<br>o R64 regional road.<br>o R706 regional road.<br>o Abrahamskraal road.<br>o A gravel road adjacent to site. For the sake of this report, this gravel road will be referred to as the "Adjacent gravel road".<br>o Other roads in and around Bloemfontein.<br>o Private aerodromes. |
| Point Receptors | o Homesteads on farms.<br>o Lodging facilities. |

### 7.9.2 Zone of Theoretical Visibility (ZTV) Model

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

**Table 7.10:** ZTV Rating System.

| Distance / radius (km) | Visibility rating in terms of proximity |
|---|---|
| 0-1 | Very high |
| 1-3 | High |
| 3-5 | Medium |
| 5-10 | Low |

Tables 7.11 and 7.12 below reflects the visibility rating in terms of proximity on sensitive receptors of the proposed Acrux Solar PV Project One and the grid connection corridor respectively. 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. Refer to Figures 7.22 and 7.23.

**Table 7.11:** ZTV Visibility Rating in terms of the proximity to Acrux Solar PV Project One.

| Radius | Visual Receptors | Visibility rating in terms of proximity |
|---|---|---|
| 0-1km | - Five homesteads on farms<br>- Adjacent gravel road<br>- Highlands Nature Reserve<br><br>**Visibility Coverage: 77.85%** | Very High |
| 1-3km | - 11 homesteads on farms<br>- Adjacent gravel road<br>- Highlands Nature Reserve<br>- Small section of smallholdings<br>- General De Wet Shooting Range | High |

| | | |
|---|---|---|
| | **Visibility Coverage: 38.97%** | |
| 3-5km | - 10 homesteads on farms<br>- Adjacent gravel road<br>- Abrahamskraal road<br>- Highlands Nature Reserve<br>- Smallholdings<br><br>**Visibility Coverage: 30.08%** | Medium |
| 5-10km | - 47 homesteads on farms<br>- Two lodging facilities<br>- Smallholdings<br>- Highlands Nature Reserve<br>- Abrahamskraal road<br>- R64 regional road<br>- N8 National Road<br>- One private airstrip<br>- Olienkloof Nature Reserve<br>- De Brug Military Base<br><br>**Visibility Coverage: 19.07%** | Low |

**Table 7.12:** ZTV Visibility Rating in terms of the proximity to the grid connection corridor.

| Radius | Visual Receptors | Visibility rating in terms of proximity |
|---|---|---|
| 0-1km | - Six homesteads on farms<br>- Adjacent gravel road<br><br>**Visibility Coverage: 96.67%** | Very High |
| 1-3km | - 23 homesteads on farms<br>- Adjacent gravel road<br>- Smallholdings<br><br>**Visibility Coverage: 64.47%** | High |
| 3-5km | - 15 homesteads on farms<br>- Smallholdings<br>- Adjacent gravel road<br>- Highlands Nature Reserve | Medium |

| | | |
|---|---|---|
| | - Small section of Langenhoven Park, a suburb of Bloemfontein.<br>- N8 National Road<br>- Olienkloof Nature Reserve<br><br>**Visibility Coverage: 35.51%** | |
| 5-10km | - 32 homesteads on farms<br>- 16 lodging facilities<br>- Smallholdings<br>- One private airstrip<br>- R64 regional road<br>- Abrahamskraal road<br>- N8 National Road<br>- N1 National Road<br>- Small area of Bloemfontein<br>- Highlands Nature Reserve<br>- Olienkloof Nature Reserve<br><br>**Visibility Coverage: 17.32%** | Low |

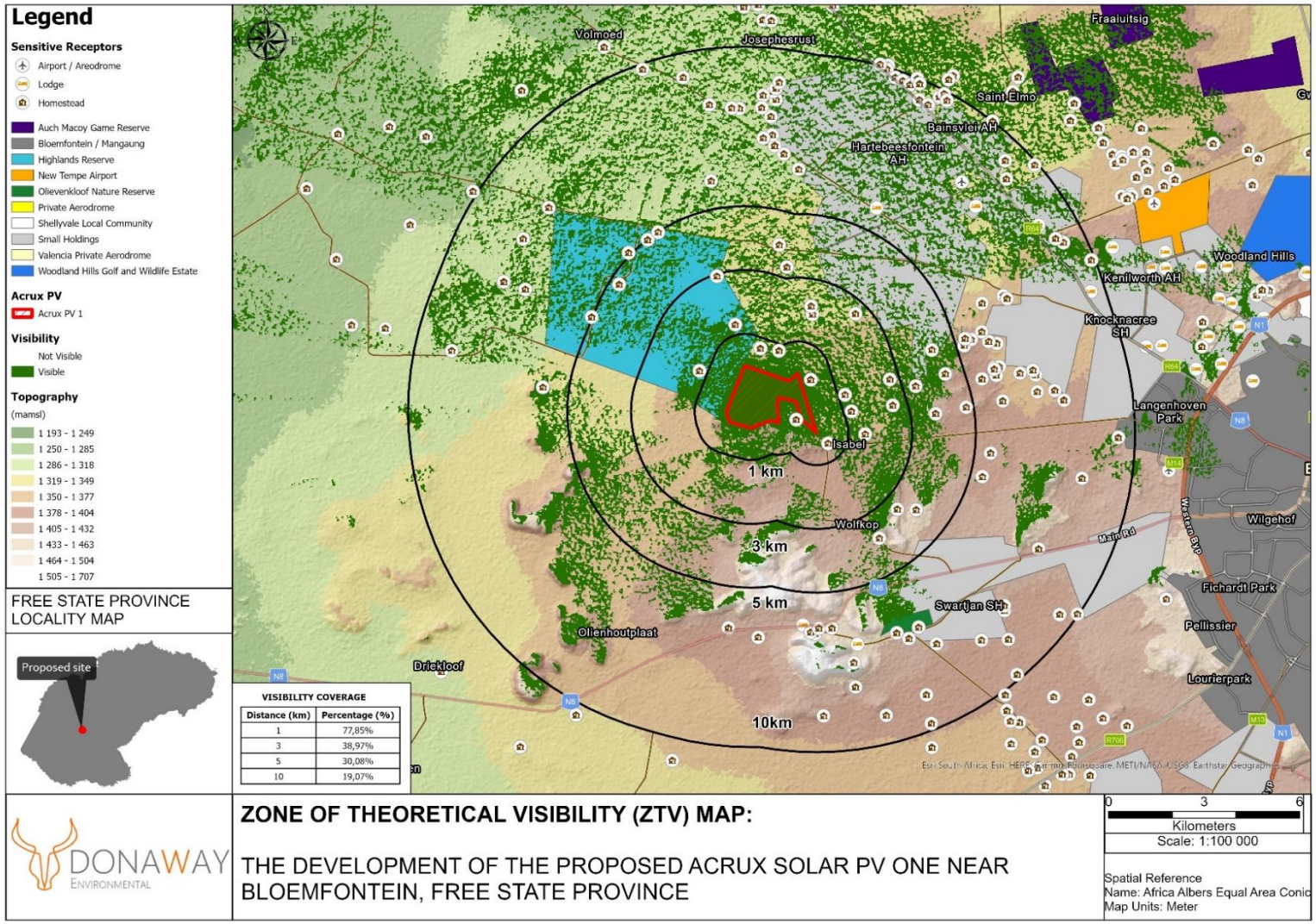


Figure 7.22: ZTV of the Acrux Solar PV Project One.

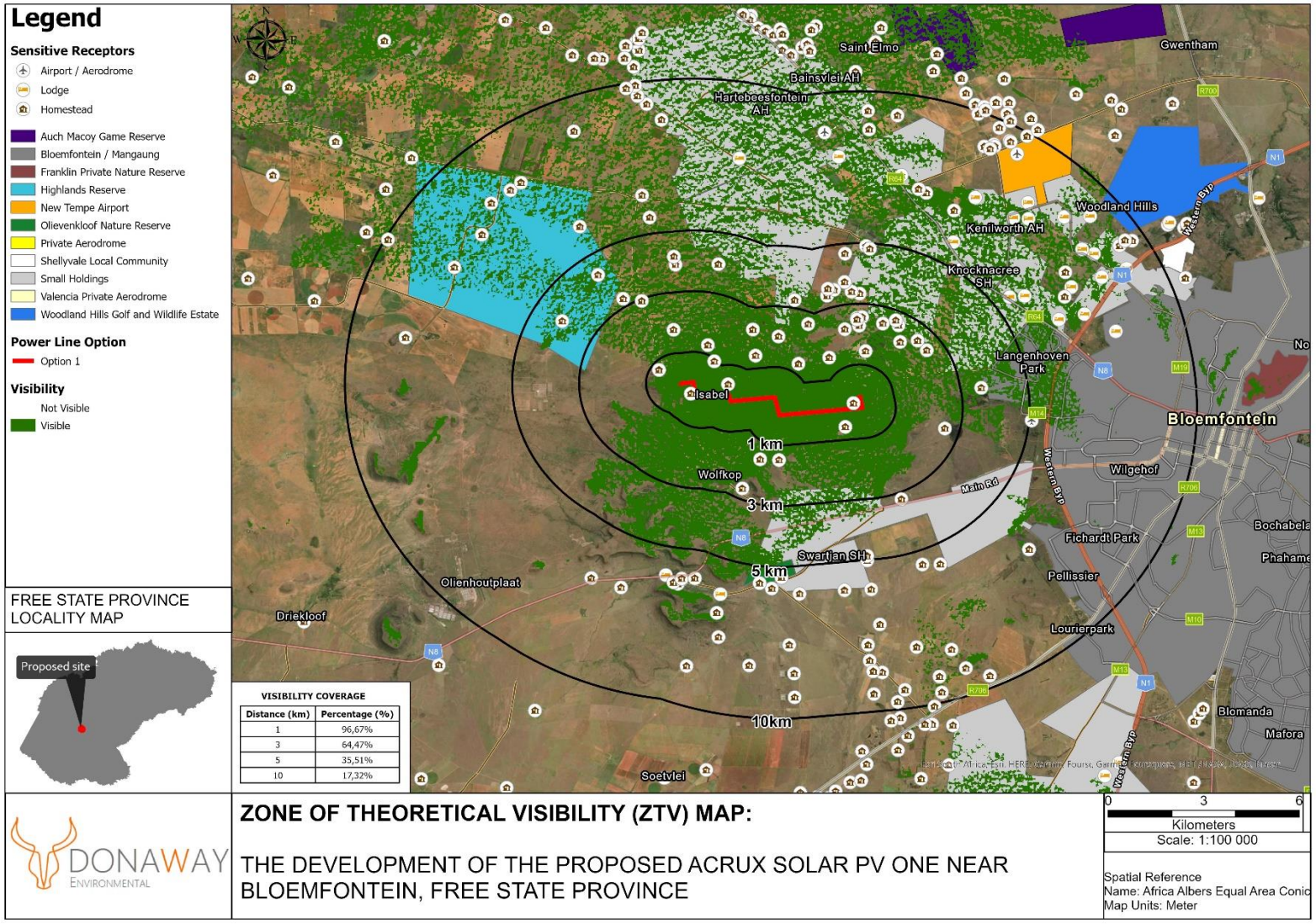


Figure 7.23: ZTV of the grid connection corridor.

## 7.10 Heritage Aspects

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

### 7.10.1 Cultural Landscape and Heritage Resources

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. The sections that follow provide an indication of the landscape considering the Stone Age, Iron Age and Historic period.

*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 the Middle Stone Age (MSA) and Later Stone Age (LSA) stone tools, mostly occurring on hills and outcrops surrounding the city.

*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 development 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. Dreyer (2005c) identified what he believed to be stone walling dating to the Late Iron Age on the farm Wolfkop northwest of the development area. However, on closer inspection, it is believed that these sites are of early historic origin and probably were occupied by early farm labourers.

*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; Van Schalkwyk 2018).

### 7.10.2 Resources identified within the Development Area

From a review of the available old maps and aerial photographs it was confirmed that the development area has always been open space, with the main activity being grazing and agricultural fields. Farming related features such as tracks and dams are the only built elements to be seen.

The specialist has identified through fieldwork specific resources within the Development Area that may be impacted.

Two burial sites have been identified by means of different sources to occur in the vicinity of the development area. According to the 1949 version of the topographic map a cemetery occurs west of the farmstead, outside of the development footprint. Interestingly, it does not feature on any of the later maps. The affected landowner does not have any information on this site or its existence.

The location of the confirmed burial site falls within the development area but outside of the development footprint of the PV Facility. It is however located within the grid connection corridor and will need to be avoided by the placement of the power line. Refer to Figure 7.24 below.

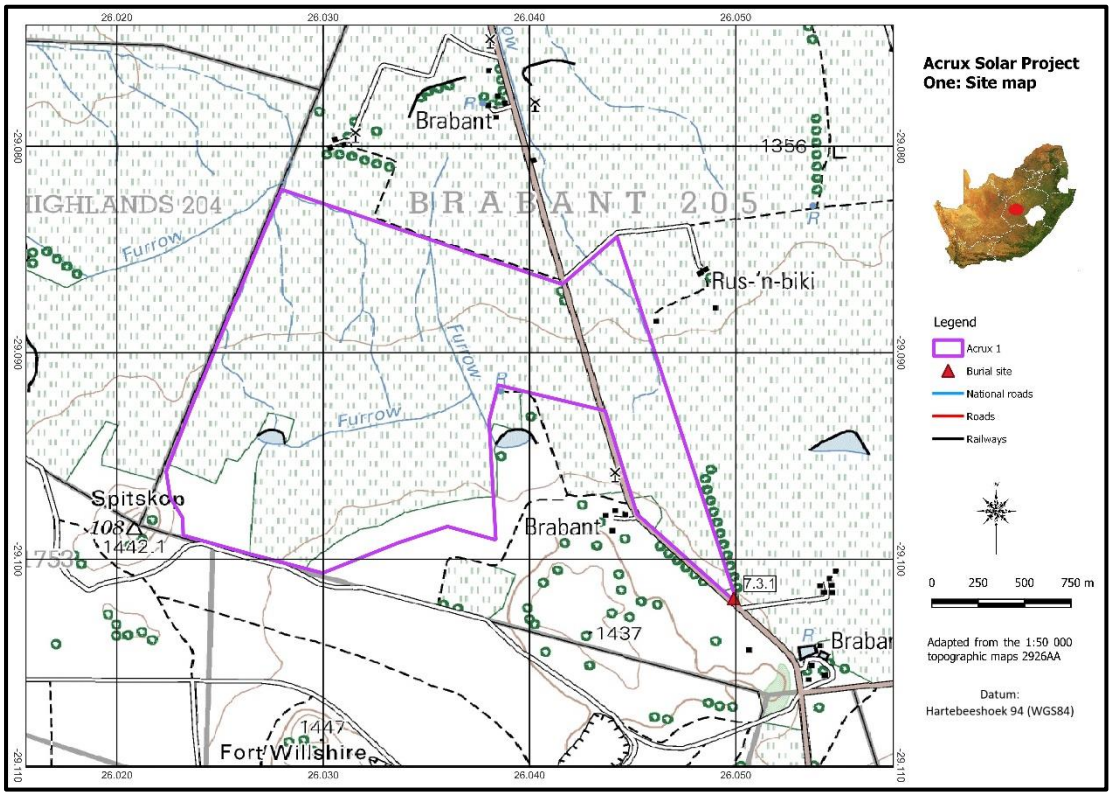


**Figure 7.24:** Heritage resources associated with the Acrux Solar PV Project One site.

The confirmed burial site seems to be a very old and neglected burial site and there are no indications of recent visits by descendants. Due to the dense vegetation cover and the neglected state of the burials, it was impossible to obtain details such as the number of graves or of the people who were buried there.

Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed. Refer to Figure 7.25 below for photographs of the burial site.

**Figure 7.25:** Views of the burial site.

### 7.10.3 Palaeontological Resources

A Palaeontological Impact Assessment (Appendix E8) has been undertaken for the development of the Acrux Solar PV Project One.

The proposed Acrux Solar PV Project One near Bloemfontein in the Free State is depicted on the 1:250 000 Bloemfontein 2926 Geological map (1966) (Council of Geoscience, Pretoria). This map indicates that the development area is underlain by the Permian aged sediments of the Ecca (K2u, Upper Stage) in the north while the southern portion of the development is underlain by the Lower Stage (K3l) of the Beaufort Group, Karoo Series. The south-east margins of the development are underlain by Post-Karoo Dolerite.

The grid corridor is underlain by the Lower Stage (K3l) of the Beaufort Group, Karoo Series with the western portion of both alternatives are underlain by the Post-Karoo Dolerite (red).

The PalaeoMap of the South African Heritage Resources Information System (SAHRIS) (Figure 7.25) indicates that the Palaeontological Sensitivity of the Jurassic Dolerite is Zero as it is igneous in origin and thus unfossiliferous, while that of the Adelaide Subgroup (Beaufort Group) is Very High (Almond and Pether, 2009; Almond et al., 2013, Groenewald et al 2014).

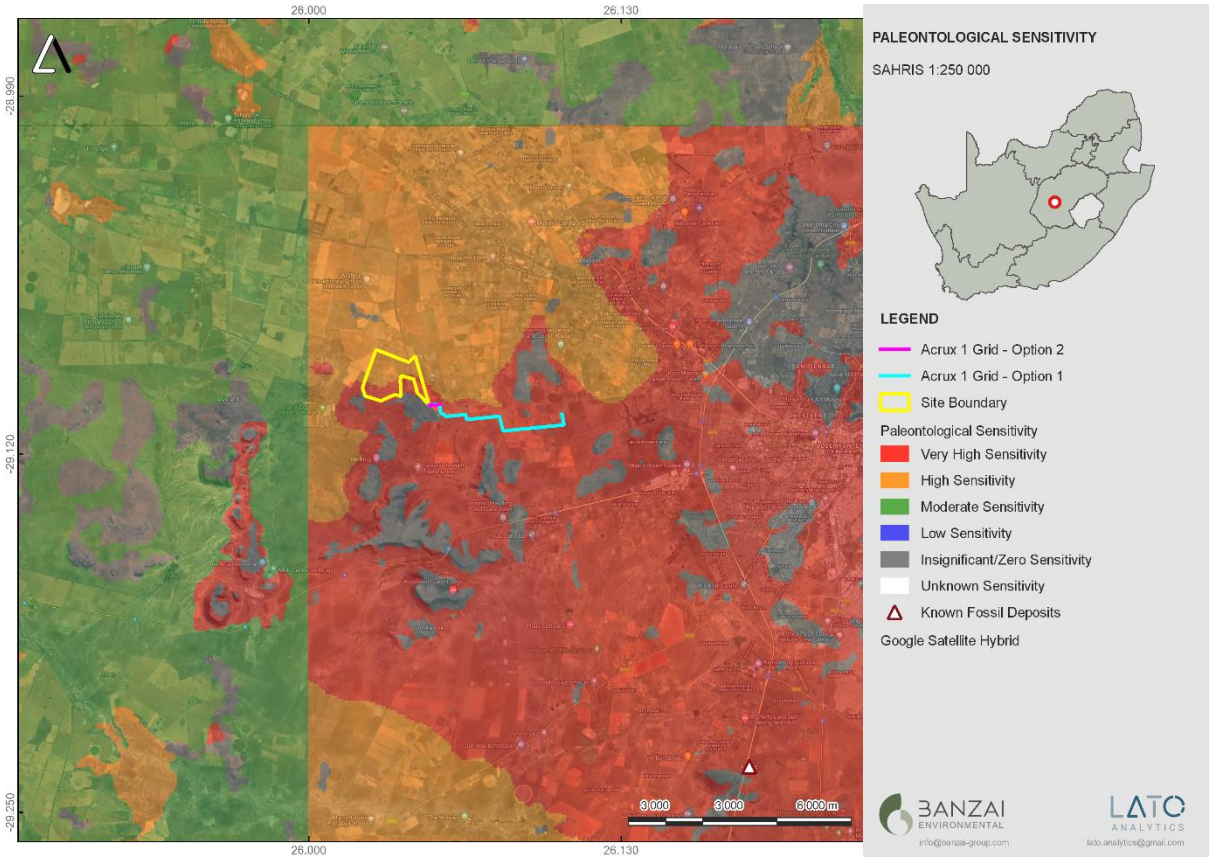


**Figure 7.26:** Extract of the SAHRIS PalaeoMap (Council of Geosciences) indicating that Acrux Solar PV Project One is underlain by sediments with a High (orange), Very High (red) and Zero (grey) Palaeontological Sensitivity.

A site-specific field survey of the development footprint was conducted on foot and by motor vehicle on 15-16 March 2023. No fossiliferous outcrops were identified during the site visit. This could be attributed to the lack of outcrops as well as the lush grassy vegetation in the area. Figures 7.27 – 7.29 provide photographs of the site as per the findings of the Palaeontological Impact Assessment.

**Figure 7.27:** General view of the development area which indicates lush vegetation with a lack of outcrops.

**Figure 7.28:** Dolerite koppie mantled by quaternary sediments and lush vegetation.

**Figure 7.29:** Lush grassy vegetation with no outcrops visible.

## 7.11 Concluding Statement

From an environmental perspective the development footprint proposed within the assessed development area is considered highly desirable in terms of geology, vegetation and landscape features, climate, biodiversity and the visual landscape with minimal confirmed environmental sensitivities which can easily be avoided through the careful placement of infrastructure considering the features and associated buffers (where relevant).

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

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

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

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

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

| | |
|---|---|
| | gathered from on-site investigations and as received from various specialist investigations. Copies of the specialist assessment reports are attached as Appendix E. |

# 8 IMPACT ASSESSMENT

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

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

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

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

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

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

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

## 8.1 Assessment of Potential Impacts and Issues

The impacts and issues are assessed below per specialist field.

### 8.1.1 Impacts on Terrestrial Ecology

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

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

The proposed activities associated with Acrux Solar PV Project One are likely to be of a medium to high impact, and the careful placement of the development and activities is therefore important so as to minimise the damage to natural resources.

Any irresponsible and/or medium to high impact activities will likely result in the loss of indigenous vegetation; local fauna species (through direct mortality during clearing and construction activities, or through indirect mortality via the inappropriate control of waste material); and foraging and traversing routes, and/or nesting sites, relevant to the wide diversity of fauna that will make use of certain areas.

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

Impacts have been identified and assessed for the construction and operation phases of the development. The specialist has indicated that the planning and decommissioning phases were not considered based on the nature of the activity being permanent.

*Construction Phase Impacts*

Three main impacts on the terrestrial biodiversity of the site have been considered for the construction phase of the proposed activities. This phase refers to the period during site preparation, clearing and construction and is considered to have the largest short-term and direct impact on biodiversity - partly because of the high levels of regular activity, and the extensive clearing that usually takes place. The following potential impacts to terrestrial biodiversity were considered, and these are each assessed for their significance in Tables 8.1 – 8.3 that follows:

- Destruction, loss and fragmentation of habitats (including water resources), functional ecosystems and the vegetation community;
- Introduction of AIP species and invasive fauna;
- Displacement of the indigenous faunal community (including possible SCC) due to habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching)

*Operation Phase Impacts*

The impacts of daily activities associated with the operational phase are anticipated to further spread the Aline Invasive Plant species, and lead to the further deterioration of habitats due to the continuing presence of dust and other edge effect impacts. Dust inhibits the ability of plants to photosynthesize and thus leads to the degradation of surrounding natural areas. Additionally, moving vehicles do not only cause sensory disturbances to fauna, affecting their life cycles and movement, but will also lead to displacement and direct faunal mortalities due to collisions.

The operational phase is the longest phase of the project and as such the effects from impacts can cumulate over long periods of time and cause damage to the environment. It is important to actively and continuously implement and update the relevant mitigation measures for this phase to effectively reduce the compounding effect.

The following potential impacts were considered for this phase of the project, and these are each assessed for their significance in Tables 8.4 -8.6 below:

- Continued fragmentation and degradation of functional habitats and ecosystems;
- Continuing spread of AIP and weed species; and
- Ongoing displacement and direct mortalities of the faunal community (including possible SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.).

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

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

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

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

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Destruction, loss and fragmentation of habitats (including water resources), functional ecosystems and the vegetation community. | Before mitigation | Negative | 2 | 4 | 3 | 3 | 4 | 3 | 3 | 57 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | 3 | 3 | 3 | 3 | 2 | 2 | 30 | Medium (29-50) | | |

Mitigation Measures:

- Areas rated as High sensitivity in proximity to the development areas must be avoided as much is feasible. Avoided areas must be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. Mitigated development in medium sensitivity areas is permissible.
- Only those areas earmarked for development must be intruded upon and be clearly demarcated.
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further than that proposed for the project. Clearing of vegetation should be minimized and avoided where possible.
- Any individual of the protected plants that was observed needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program.
- It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the site. No plant species whether indigenous or exotic should be brought into/taken from the site, to prevent the spread of exotic or invasive species or the illegal collection of plants (apart from rehabilitation activities).
- All laydown, chemical toilets etc. should be restricted to Low and Very Low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials where possible. No storage of vehicles or equipment will be allowed outside of the designated project areas.
- All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.
- All activities must make use of existing roads and tracks as far as practically and feasibly possible.
- Any materials may not be stored for extended periods of time and must be removed from the site once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.
- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.
- A fire management plan needs to be complied and implemented to restrict the impact fire would have on the surrounding areas.
- All construction waste must be removed from site at the closure of the construction phase.
- Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes the wetting of exposed soft soil surfaces. Additional dust suppression measures can be implemented where water restrictions are applicable.

- No non-environmentally friendly suppressants may be used as this could result in the pollution of water sources.
- Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant. Additional measures must be implemented where water restrictions are applicable.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.
- A stormwater management plan must be compiled and implemented.

**Table 8.2:** Introduction and encroachment of Alien Invasive Plant Species 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Introduction and encroachment of Alien Invasive Plant (AIP) species and invasive fauna | Before mitigation | Negative | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 34 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 2 | 2 | 3 | 2 | 2 | 1 | 12 | Low (6-28) | | |
| Mitigation Measures:<br>• An Alien Invasive Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.<br>• Erosion Control Programme must be developed and implemented.<br>• All denuded areas to be rehabilitated using local indigenous species.<br>• The footprint area of the construction should be kept to a minimum, where possible. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.<br>• Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis, where possible, to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas.<br>• A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests due to the likely presence of SCC. | | | | | | | | | | | | | |

**Table 8.3:** Displacement of the indigenous faunal community 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Displacement of the indigenous faunal community (including possible SCC) due to | Before mitigation | Negative | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 57 | High (51-73) | Yes | Yes |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| habitat loss, direct mortalities, and disturbance (road collisions, noise, dust, light, vibration, and poaching). | After mitigation | Negative | 1 | 2 | 3 | 3 | 4 | 2 | 2 | 30 | Medium (29-50) | | |

Mitigation Measures:

- A qualified environmental control officer must be on site when activities begin. A site walk through is recommended by a suitably qualified ecologist prior to any activities taking place and any SCC or protected species should be noted. In situations where these species are observed and must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. In the abovementioned situation the development and implementation of a search, rescue and recovery program is suggested for the protection of these species. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.
- Clearing and disturbance activities must be conducted in a progressive linear manner and over several days, so as to provide an easy escape route for all small mammals and herpetofauna.
- Areas to be cleared must first be checked thoroughly for all fauna species and be allowed to move off or in the case of more secretive species, these must be relocated to appropriate nearby habitats via a Search and Rescue process.
- Speed control measures must be implemented.
- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- The duration of the activities should be minimized to as short a term as possible, to reduce the period of disturbance on fauna.
- Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to reptile species and nocturnal mammals.
- No trapping, killing, or poisoning of any wildlife is to be allowed.
- Signs must be put up to enforce this. Monitoring must take place in this regard.
- Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights / warm LED lights (not white light) should be used wherever possible.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons where possible.
- Any holes/deep excavations must be dug and planted in a progressive manner and shouldn't be left open overnight where possible. Should any holes remain open overnight they must be properly covered temporarily to ensure that no small fauna species fall in, and subsequently inspected prior to backfilling.
- Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed (~50 cm), the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.
- Use environmentally friendly cleaning and dust suppressant products.
- Once the development layout has been confirmed, the footprint area must be fenced off appropriately in segments pre-construction to allow animals to move or be moved out of these areas before breaking ground activities occur. Construction activities must take place systemically and the perimeter fence should not be completed (i.e., leaving sections unfenced to allow fauna to escape) until systematic clearing is completed.

Table 8.4: Continued fragmentation and degradation during Operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continued fragmentation and degradation of functional habitats and ecosystems. | Before mitigation | Negative | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 32 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 24 | Low (6-28) | | |

Mitigation Measures:

- Areas rated as High sensitivity in proximity to the development areas must be avoided as much is feasible. Avoided areas must be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent access to these areas from construction workers and machinery. Mitigated development in medium sensitivity areas is permissible.
- Avoid the further disturbance or destruction of High SEI areas, as far as possible / feasible.
- Brush cutting should be implemented beneath the panels, where possible, no vegetation clearing should be permitted as far as possible.
- No plant species whether indigenous or exotic should be brought into/taken from the development area, to prevent the spread of exotic or invasive species or the illegal collection of plants.
- A Rehabilitation Plan must be written for the development area prior to commencement of operation and ensured that it be adhered to
- Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further than that proposed for the project. Clearing of vegetation should be minimized and avoided where possible.
- Any individual of the protected plants that was observed needs a relocation or destruction permit in order for any individual that may be removed or destroyed due to the development. High visibility flags must be placed near any protected plants in order to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program.
- It must be made an offence for any staff to take/ bring any plant species into/out of any portion of the site. No plant species whether indigenous or exotic should be brought into/taken from the site, to prevent the spread of exotic or invasive species or the illegal collection of plants (apart from rehabilitation activities).
- All laydown, chemical toilets etc. should be restricted to Low and Very Low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials where possible. No storage of vehicles or equipment will be allowed outside of the designated project areas.
- All personnel to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.
- All activities must make use of existing roads and tracks as far as practically and feasibly possible.
- Any materials may not be stored for extended periods of time and must be removed from the site once the construction phase has been concluded. No permanent construction phase structures should be permitted. Construction buildings should preferably be prefabricated or constructed of re-usable/recyclable materials. No storage of vehicles or equipment will be allowed outside of the designated laydown areas.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation according to a habitat rehabilitation plan, to prevent erosion during flood and wind events and to promote the regeneration of functional habitat. This will also reduce the likelihood of encroachment by invasive alien plant species. All grazing mammals must be kept out of the areas that have recently been re-planted.
- A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.
- A fire management plan needs to be complied and implemented to restrict the impact fire would have on the surrounding areas.

- A habitat rehabilitation and revegetation plan must be developed and implemented to reduce the occurrence of bare soil areas and the associated damage to the nearby ridge and watercourses as a result of excessive erosion.
- Speed limits must be put in place to reduce erosion. Soil surfaces must be wetted as necessary to reduce the dust generated by the project activities. Speed bumps and signs must be erected to enforce slow speeds where relevant.
- Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events etc.
- A stormwater management plan must be compiled and implemented.

**Table 8.5:** Continuing spread of Alien Invasive Plant Species 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continuing spread of Alien Invasive Plant (AIP) and weed species. | Before mitigation | Negative | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 34 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 24 | Low (6-28) | | |
| Mitigation Measures:<br>• An Alien Invasive Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition.<br>• The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprints of the roads must be kept to prescribed widths.<br>• Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis, where possible, to prevent rodents and pests entering the site. A location specific waste management plan must be put in place to limit the presence of rodents and pests and waste must not be allowed to enter surrounding areas.<br>• A pest control plan must be put in place and implemented; it is imperative that poisons not be used to control pests due to the likely presence of SCC. | | | | | | | | | | | | | |

**Table 8.6:** Ongoing displacement and direct mortalities of the faunal community 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ongoing displacement and direct mortalities of the faunal community (including possible SCC) due to continued disturbance (road collisions, noise, light, dust, vibration, poaching, etc.). | Before mitigation | Negative | 3 | 3 | 2 | 3 | 3 | 4 | 2 | 36 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 26 | Low (6-28) | | |

Mitigation Measures:

- The areas to be disturbed must be specifically and responsibly demarcated to prevent the movement of staff or any individual into the surrounding environments, signs must be put up to enforce this.
- Noise must be kept to an absolute minimum from dusk till dawn to minimize all possible disturbances to reptile species and nocturnal mammals.
- Speed control measures must be implemented.
- No trapping, killing, or poisoning of any wildlife is to be allowed.
- Signs must be put up to enforce this. Monitoring must take place in this regard.
- Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights /warm LED (not white light) should be used wherever possible.
- All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited.
- Schedule activities and operations during least sensitive periods, to avoid migration, nesting, and breeding seasons.
- Use environmentally friendly cleaning and dust suppressant products.

### 8.1.2 Impacts to Wetlands

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

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

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

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

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

*Construction Phase Impacts*

- Direct disturbance / degradation / loss to wetland soils or vegetation due to the construction.
- Increased bare surfaces, runoff, erosion and sedimentation.
- Potential contamination of the wetland with machine oils and construction materials.
- Introduction and spread of alien and invasive vegetation.
- Increased sediment loads to downstream reaches.
- Contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment and vehicles as well as contamination and eutrophication of wetland systems with human sewerage and litter.

*Operation Phase Impacts*

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

*Decommissioning Phase Impacts*

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

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

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

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

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

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

| Activity | Aspect | Impact | Mitigation | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | |
| Construction | | | | | | | | | | | | | | | | | | | |
| Site clearing and preparation. | Wetland disturbance / loss. | Direct disturbance / degradation / loss to wetland soils or vegetation due to the construction of the solar facility. | Without | 4 | 4 | 4 | 4 | 4 | 1 | 2 | 7 | 1 | 3 | 5 | 2 | 11 | 77 | M | • Clearly demarcate the construction footprint and restrict all construction activities to within the proposed infrastructure area.<br>• When clearing vegetation, where possible allow for some vegetation cover as opposed to bare areas.<br>• Minimize the disturbance footprint and the unnecessary clearing of vegetation outside of this area.<br>• Use the wetland shapefiles to signpost the edge of the wetlands closest to site. Place the sign 25 m from the edge (this is the buffer zone). Label these areas as "environmentally sensitive areas, keep out!".<br>• Educate staff and relevant contractors on the location and importance of the identified wetland through toolbox talks and by including them in site inductions as well as the overall master plan.<br>• All activities (including driving) must adhere to the 20m buffer area.<br>• Promptly remove / control all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.<br>• All alien vegetation along the transmission powerline servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources |
| | | | With | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 4 | 1 | 2 | 5 | 2 | 10 | 40 | L | |

| Activity | Aspect | Impact | Mitigation | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | Act, Act 43 of 1983. By this Eskom is obliged to control.<br>• Landscape and re-vegetate all denuded areas as soon as possible. |
| | Water runoff from construction site. | Increased erosion and sedimentation. | Without | 4 | 4 | 3 | 2 | 3.25 | 3 | 2 | 8.25 | 1 | 4 | 1 | 2 | 8 | 66 | M | • Where possible, limit construction activities near (< 50m) the wetland to winter (as much as possible) when rain is least likely to wash concrete and sand into the wetland. Activities in black turf soils can become messy during the height of the rainy season and construction activities should be minimised during these times to minimise unnecessary soil disturbances.<br>• Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.<br>• No activities are permitted within the wetland and associated buffer areas.<br>• Landscape and re-vegetate all unnecessarily denuded areas as soon as possible. |
| | | | With | 2 | 2 | 1 | 1 | 1.5 | 2 | 2 | 5.5 | 1 | 2 | 1 | 2 | 6 | 33 | L | |
| | | Potential contamination of the wetland with machine oils and construction materials. | Without | 1 | 4 | 3 | 2 | 2.5 | 1 | 1 | 4.5 | 2 | 3 | 5 | 2 | 12 | 54 | L | • Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.<br>• Appropriately stockpile topsoil cleared from the site / development footprint.<br>• Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site |
| | | | With | 1 | 2 | 1 | 1 | 1.25 | 1 | 1 | 3.25 | 2 | 2 | 5 | 2 | 11 | 35.75 | L | |

| Activity | Aspect | Impact | Mitigation | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | (e.g. concrete) in such a way as to prevent them leaking and entering the wetland.<br>• Ensure that no activities are permitted within the wetland and associated buffer area. |
| Operation | | | | | | | | | | | | | | | | | | | |
| Operation of the solar facility. | Hardened surfaces. | Potential for increased stormwater runoff leading to Increased erosion and sedimentation. | Without | 4 | 4 | 2 | 2 | 3 | 3 | 2 | 8 | 5 | 4 | 1 | 2 | 12 | 96 | M | • Design and implement an effective stormwater management plan.<br>• Promote water infiltration into the ground beneath the solar panels.<br>• Release only clean water into the environment.<br>• Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g. slabs of concrete with rocks cemented in).<br>• Re-vegetate denuded areas as soon as possible.<br>• Regularly clear drains.<br>• Minimise the extent of concreted / paved / gravel areas.<br>• A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving.<br>• Avoid excessively compacting the ground beneath the solar panels. |
| | | | With | 2 | 2 | 1 | 1 | 1.5 | 2 | 2 | 5.5 | 5 | 2 | 1 | 2 | 10 | 55 | L | |
| | Contamination. | Potential for increased contaminants entering the wetland systems. | Without | 2 | 3 | 2 | 2 | 2.25 | 1 | 1 | 4.25 | 5 | 2 | 5 | 2 | 14 | 59.5 | M | • Where possible minimise the use surfactants to clean solar panels and herbicides to control vegetation beneath the panels. If surfactants and herbicides must be used do so well prior to any significant predicted rainfall events. |
| | | | With | 1 | 2 | 1 | 1 | 1.25 | 1 | 1 | 3.25 | 5 | 2 | 5 | 1 | 13 | 42.25 | L | |

| Activity | Aspect | Impact | Mitigation | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | |
| Closure | | | | | | | | | | | | | | | | | | | |
| Decommissioning of the solar facility. | Rehabilitation. | Potential loss or degradation of nearby wetlands through inappropriate closure. | Without | 4 | 4 | 4 | 4 | 4 | 3 | 2 | 9.75 | 1 | 3 | 1 | 1 | 6 | 58.5 | M | • Develop and implement a rehabilitation and closure plan.<br>• Appropriately rehabilitate the project area by ripping landscaping and re-vegetating with locally indigenous species. |
| | | | With | 2 | 2 | 1 | 1 | 1.5 | 2 | 2 | 5.5 | 1 | 2 | 1 | 1 | 5 | 27.5 | L | |
| In accordance with General Notice 509 "Risk is determined after considering all listed control / mitigation measures. Borderline Low / Moderate risk scores can be manually adapted downwards up to a maximum of 25 points (from a score of 80) subject to listing of mitigation measures. | | | | | | | | | | | | | | | | | | | |

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

| Activity | Aspect | Impact | Mitigation Scenario | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | |
| Construction | | | | | | | | | | | | | | | | | | | |
| Clearing and preparation of powerline route including storage of equipment | Wetland vegetation deterioration and soil exposure. | Disturbance and degradation of wetland vegetation | Without | 2 | 2 | 3 | 2 | 2.25 | 2 | 2 | 6.25 | 2 | 3 | 5 | 1 | 11 | 68.75 | M | • Restrict the disturbance and clearance footprint to within 5 m on either side of the proposed grid connection corridor (10 m disturbance corridor, where possible). In this case, 31 m is required as a servitude area and so efforts should be made to restrict clearance to this distance.<br>• Avoid wetlands and buffers where feasible.<br>• Implement a rehabilitation plan for any disturbed wetland. Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent wetland and buffer area. |
| | | | With | 2 | 1 | 1 | 1 | 1.25 | 2 | 2 | 5.25 | 2 | 1 | 5 | 1 | 9 | 47.25 | L | |

| Activity | Aspect | Impact | Mitigation Scenario | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | • Reduce the disturbance footprint and the unnecessary clearing of vegetation when traversing the identified drainage lines.<br>• Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas. |
| | | Increased bare surfaces, runoff and potential for erosion | Without | 2 | 3 | 2 | 2 | 2.25 | 2 | 2 | 6.25 | 2 | 3 | 5 | 1 | 11 | 68.75 | M | • Keep tower base excavation and soil heaps neat and tidy.<br>• Where possible, limit construction activities in proximity (< 50 m) to wetlands to the dry season when storms are least likely to wash concrete and sand into wetlands. This is only where pylons are within wetlands and buffer areas.<br>• Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.<br>• Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished.<br>• Limit the placement of pylons within wetlands and buffer areas where feasible.<br>• Do not situate any of the construction material laydown areas within any wetland or buffer area. Try adhering to a 20m buffer in these instances.<br>• No machinery should be allowed to park in any wetlands or buffer areas. |
| | | | With | 2 | 2 | 1 | 1 | 1.5 | 2 | 2 | 5.5 | 2 | 1 | 5 | 1 | 8 | 44 | L | |
| | | Introduction and spread of alien and invasive vegetation | Without | 1 | 1 | 3 | 3 | 2 | 1 | 2 | 5 | 3 | 3 | 5 | 1 | 12 | 60 | M | • Promptly remove all alien and invasive plant species that may emerge during construction (i.e. weedy annuals and other alien forbs) must be removed.<br>• Limit soil disturbance. |
| | | | With | 1 | 1 | 2 | 1 | 1.25 | 1 | 2 | 4.25 | 3 | 1 | 1 | 1 | 6 | 26 | L | |

| Activity | Aspect | Impact | Mitigation Scenario | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | • The use of herbicides is not recommended in or near wetlands (opt for mechanical removal).<br>• Appropriately stockpile topsoil cleared from the power line footprint.<br>• Clearly demarcate power line construction footprint and limit all activities to within this area.<br>• Minimize unnecessary clearing of vegetation beyond the tower footprints and power line corridors.<br>• Lightly till any disturbed soil around the tower footprint to avoid compaction. |
| Excavation, levelling and installation of transmission towers. | Soil disturbance, sedimentation | Increased sediment loads to downstream reaches | Without | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 7 | 3 | 2 | 1 | 1 | 7 | 49 | L | • See mitigation for increased bare surfaces, runoff and potential for erosion.<br>• Re-instate topsoil and lightly till transmission tower disturbance footprint. |
| | | | With | 1 | 1 | 1 | 1 | 1 | 3 | 2 | 6 | 3 | 1 | 1 | 1 | 6 | 42 | L | |
| | | Contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles as well as Contamination and eutrophication of wetland systems with human | Without | 1 | 3 | 3 | 2 | 2.25 | 2 | 2 | 6.25 | 3 | 3 | 1 | 1 | 8 | 50 | L | • Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.<br>• Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering wetland or buffer areas.<br>• Mixing of concrete must under no circumstances take place within the wetland or buffer area.<br>• Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter.<br>• Provide appropriate sanitation facilities for workers during construction and service them regularly.<br>• The Contractor should supply sealable and properly marked domestic waste collection bins |
| | | | With | 1 | 2 | 1 | 1 | 1.25 | 2 | 2 | 5.25 | 3 | 1 | 1 | 1 | 6 | 31.5 | L | |

| Activity | Aspect | Impact | Mitigation Scenario | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | |
| | | sewerage and litter. | | | | | | | | | | | | | | | | | and all solid waste collected must be disposed of at a licensed disposal facility.<br>• The Contractor must be in possession of an emergency spill kit that must always be complete and available on site.<br>• Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility. |
| Operation | | | | | | | | | | | | | | | | | | | |
| Routine operation and maintenance of power line route | Clearing of wetland vegetation beneath power line | Degradation of wetland vegetation wetland vegetation. | Without | 1 | 1 | 2 | 3 | 1.75 | 2 | 1 | 4.75 | 3 | 3 | 5 | 1 | 10 | 47.5 | L | • Clear vegetation in line with the 2010 Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead powerline servitudes".<br>• Avoid the use of herbicides and diesel to treat stumps within the wetland and buffer areas.<br>• Make use of existing access routes as much as possible, before new routes are considered. Any selected "new" route must not encroach into the wetland areas. |
| | | | With | 1 | 1 | 1 | 2 | 1.25 | 2 | 1 | 4.25 | 3 | 1 | 5 | 1 | 10 | 42.5 | L | |
| | Alien and Invasive species | Proliferation of alien and invasive species | Without | 1 | 1 | 3 | 2 | 1.75 | 2 | 2 | 5.75 | 3 | 1 | 5 | 1 | 10 | 67.5 | M | • In line with the 2010 Eskom Environmental Procedure Document entitled "Procedure for vegetation clearance and maintenance within overhead powerline servitudes" all alien vegetation along the transmission servitude should be managed in terms of the Regulation GNR.1048 of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. By this Eskom is obliged to control category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, |
| | | | With | 1 | 1 | 1 | 2 | 1.25 | 2 | 1 | 4.25 | 3 | 1 | 5 | 1 | 10 | 42.5 | L | |

| Activity | Aspect | Impact | Mitigation Scenario | Severity | | | | | Spatial scale | Duration | Consequence | Frequency of activity | Frequency of impact | Legal Issues | Detection | Likelihood | Significance | Risk Rating | Control Measures |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Flow Regime | Water Quality | Habitat | Biota | Severity | | | | | | | | | | | multiplication, propagation, regeneration and spreading such plants within servitude areas. |
| **Decommissioning** | | | | | | | | | | | | | | | | | | | |
| Removal of transmission towers and lines | Vehicle access | Degradation of wetland vegetation and proliferation of alien and invasive species | Without | 2 | 2 | 3 | 3 | 2.5 | 2 | 2 | 6.5 | 3 | 1 | 5 | 1 | 10 | 65 | M | • See mitigation for the impacts on direct loss, disturbance and degradation of wetlands and spread of alien and invasive plants.<br>• Control should continue for a minimum of three years following decommissioning. |
| | | | With | 1 | 1 | 2 | 2 | 1.5 | 2 | 2 | 5.5 | 3 | 1 | 5 | 1 | 10 | 55 | L | |
| | Re-excavation of Transmission Towers | Increased bare surfaces, runoff and potential for erosion | Without | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 3 | 3 | 1 | 1 | 8 | 48 | L | • See mitigation for increased bare surfaces, runoff and potential for erosion and increased sediment loads during construction. |
| | | | With | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 5 | 3 | 1 | 1 | 1 | 6 | 30 | L | |
| In accordance with General Notice 509 "Risk is determined after considering all listed control / mitigation measures. Borderline Low / Moderate risk scores can be manually adapted downwards up to a maximum of 25 points (from a score of 80) subject to listing of mitigation measures. | | | | | | | | | | | | | | | | | | | |

### 8.1.3 Impacts on Avifauna

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

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

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

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

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

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

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

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

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

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

- Indigenous vegetation;
- Local fauna species (through direct mortality during clearing and construction activities, or through indirect mortality via the inappropriate control of waste material); and
- Foraging and traversing routes, and/or nesting sites, relevant to the wide diversity of fauna that will make use of certain areas.

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

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

The results of the assessment indicate that during the construction, operation and decommissioning phases impacts may be of high or medium significance, depending on the impact under consideration, and with the implementation of the recommended mitigation measures the impact significance will be reduced to either low or medium. All impacts can be reduced to an appropriate level of significance with the implementation of the recommended mitigation measures and therefore the development is considered to be appropriate. Tables 8.9-8.21 provide the results of the avifauna impact assessment.

Table 8.9: Vegetation clearance during construction.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vegetation clearance as part of the construction phase activities | Before mitigation | Negative | 2 | 4 | 2 | 3 | 3 | 3 | 3 | 51 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | 4 | 2 | 2 | 3 | 3 | 2 | 30 | Medium (29-50) | | |
| Mitigation Measures:<br>• Demarcation and avoidance of the riparian area outside of the development footprint must be done by using safety tape / or a sign to ensure a known barrier is present that may not be crossed.<br>• Solar panels must be mounted on pile driven or screw foundations, such as post support spikes, rather than heavy foundations, such as trench-fill or mass concrete foundations, to reduce the negative effects on natural soil functioning, such as its filtering and buffering characteristics, while maintaining habitats for both fossorial and epigenic biodiversity (Bennun et al, 2021). If concrete foundations are used that would increase the impact of the project as there would be direct impacts to soil permeability and characteristics, thereby influencing inhabitant fauna. In addition, stormwater runoff and runoff from cleaning the panels would be increased, increasing erosion in the surrounding areas.<br>• Indigenous vegetation to be maintained under the solar panels to ensure biodiversity is maintained and to prevent soil erosion (Beatty et al, 2017; Sinha et al, 2018). The photographs below are sourced from these documents.<br>• Vegetation clearing to commence only after the necessary permits have been obtained.<br>• Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities.<br>• Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place. | | | | | | | | | | | | |

Table 8.10: Destruction, degradation and fragmentation 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Destruction, degradation and fragmentation of surrounding habitats | Before mitigation | Negative | 2 | 4 | 2 | 4 | 3 | 3 | 3 | 54 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | Low (6-28) | | |
| Mitigation Measures:<br>• Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, remaining within demarcated construction areas etc.<br>• All solid waste must be managed in accordance with a Solid Waste Management Plan. Recycling is encouraged.<br>• All construction activities and roads to be within the clearly defined and demarcated areas.<br>• Temporary laydown areas must be clearly demarcated and rehabilitated with indigenous vegetation subsequent to end of use.<br>• Appropriate dust control measures to be implemented. | | | | | | | | | | | | |

- Suitable sanitary facilities to be provided for construction staff as per the guidelines in Health and Safety Act.
- Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.
- All hazardous materials, if any, must be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner.

Table 8.11: Displacement/emigration of avifauna due to noise 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Displacement/emigration of avifauna community (including SCC) due to noise pollution | Before mitigation | Negative | 2 | 4 | 2 | 2 | 2 | 3 | 3 | 45 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 28 | Low (6-28) | | |
| Mitigation Measures:<br>• Construction activity should be restricted to daylight hours where possible, as nocturnal species are highly dependent on sound and/or vocalisations for behavioural processes. However, low impact and low noise construction activities with minimal light might be considered during nighttime.<br>• All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.<br>• If generators are to be used these must be soundproofed. Reduce the decibel level of a generator by 15-30 decibels. | | | | | | | | | | | | | |

Table 8.12: Direct mortality from prosecution 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct mortality from persecution or poaching of avifauna species and collection of eggs | Before mitigation | Negative | 2 | 3 | 2 | 2 | 2 | 4 | 3 | 45 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 8 | Low (6-28) | | |
| Mitigation Measures:<br>• All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting species and collecting eggs.<br>• Prior to commencing work each day, where possible, two individuals should traverse the working area in order to disturb any avifauna and so they have a chance to vacate the area.<br>• Any avifauna threatened by the construction activities that does not vacate the area should be removed safely by an appropriately qualified environmental officer or removal specialist. | | | | | | | | | | | | | |

**Table 8.13:** Direct mortality from increased traffic 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct mortality from increased vehicle and heavy machinery traffic | Before mitigation | Negative | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 32 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 11 | Low (6-28) | | |
| Mitigation Measures:<br>• All personnel must undergo environmental induction with regards to awareness about speed limits and roadkill.<br>• All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected. | | | | | | | | | | | | | |

**Table 8.14:** Collisions with PV 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Collisions with infrastructure associated with the Solar PV Facility | Before mitigation | Negative | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 60 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 48 | Low (6-28) | | |
| Mitigation Measures:<br><br>Solar:<br>• Post-construction monitoring should follow the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). If monitoring results indicate excessive bird fatalities, then adaptive mitigations should be implemented. Before implementation, these should be discussed with the avifaunal specialist and ECO and could include the retrofitting/incorporation of additional visual cues/diverters to existing PV panels/infrastructure.<br><br>Fencing:<br>• Top 2 strands must be smooth wire.<br>• Routinely retention loose wires.<br>• Minimum distance between wires is 300 mm.<br>• Place markers on fences. | | | | | | | | | | | | | |

Power Line:

- The design of the proposed grid connection must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.
- The air space used by the gridlines /tie in lines must be minimised by placing them underground as far as possible.
- Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. Place pylons and associated infrastructure along exciting infrastructure if possible (e.g. roads, other power lines).
- The power line should be marked with bird diverters along the entire line in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that Blue Crane mortality was reduced by 92% (95% confidence interval [CI]: 77–97%) and all large birds by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted along the entire length of the OHL. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites. The devices must be placed between 5 m and 15 m apart.

**Table 8.15:** Electrocution due to 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electrocution due to infrastructure associated with the Solar PV Facility | Before mitigation | Negative | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 45 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 22 | Low (6-28) | | |
| Mitigation Measures:<br>• The design of the proposed grid connection must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa.<br>• Insulation where energised parts and/or grounded parts are covered with materials appropriate for providing incidental contact protection to birds. It is best to use suspended insulators and vertical disconnectors, if upright insulators or horizontal disconnectors are present, these should be covered.<br>• The use of perch guards or spikes are discouraged. It is recommended to make use of artificial bird safe perches, which are placed at a safe distance from the energised parts. | | | | | | | | | | | | |

**Table 8.16:** Direct mortality from roadkill, persecution or poaching 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct mortality from roadkills, persecution or poaching of avifauna species and collection of eggs | Before mitigation | Negative | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 32 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 10 | Low (6-28) | | |

Mitigation Measures:

- All personnel must undergo environmental awareness training that includes educating on not poaching/persecuting avifauna species and collecting eggs.
- Signs must be put up to enforce this. Should someone be caught, an appropriate fine must be enforced.
- All personnel must undergo environmental induction with regards to awareness about speed limits and roadkill.
- All vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected.

**Table 8.17:** Pollution of water sources and surrounding habitat 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pollution of water sources and surrounding habitat due to cleaning products of the solar panels | Before mitigation | Negative | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 51 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | Low (6-28) | | |
| Mitigation Measures:<br>• Only environmentally friendly chemicals are to be used for cleaning of the panels. | | | | | | | | | | | | | |

**Table 8.18:** Heat radiation during operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heat radiation from the BESS and solar panels | Before mitigation | Negative | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 45 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 22 | Low (6-28) | | |
| Mitigation Measures:<br>• The BESS must be enclosed in a structure with a non-reflective surface.<br>• A fire management plan needs to be put in place.<br>• Existing vegetation should be kept under the panels to ensure that additional reflection is not taking place from the surface below the panels. | | | | | | | | | | | | | |

**Table 8.19:** Encroachment of Invasive Alien Plants during operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Encroachment of Invasive Alien Plants (AIP) into disturbed areas | Before mitigation | Negative | 2 | 4 | 3 | 4 | 4 | 3 | 3 | 60 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | Low (6-28) | | |
| Mitigation Measures:<br>• An IAP Management Plan must be written and implemented for the development. The developer must contract a specialist to develop the plan and the developer is responsible for its implementation; and<br>• All IAP species must be removed/controlled using the appropriate techniques as indicated in the IAP management plan. | | | | | | | | | | | | | |

**Table 8.20:** Direct mortality during decommissioning.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Direct mortality due to earthworks, vehicle collisions and persecution. | Before mitigation | Negative | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 32 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 8 | Low (6-28) | | |
| Mitigation Measures:<br>• All personnel should undergo environmental awareness training including educating about not harming or collecting avifauna species;<br>• Prior to commencing work each day, two individuals should traverse the working area in order to disturb any avifauna and so they have a chance to vacate;<br>• Any avifauna threatened by the construction activities must be removed safely by an appropriately qualified environmental officer or removal specialist;<br>• All construction vehicles must adhere to a speed limit of maximum 40 km/h to avoid collisions. Appropriate speed control measures and signs must be erected;<br>• All hazardous materials, if any, should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner;<br>• All infrastructure must be removed if the facility is decommissioned; and<br>• The development footprint must be rehabilitated, and a management plan must be in place to ensure that it is done successfully to restore the avifauna community and their associated habitat. | | | | | | | | | | | | |

**Table 8.21:** Continued habitat degradation due to Invasive Alien Plant encroachment during decommissioning.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continued habitat degradation due to Invasive Alien Plant (AIP) encroachment and erosion | Before mitigation | Negative | 2 | 4 | 4 | 4 | 4 | 3 | 3 | 63 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 22 | Low (6-28) | | |
| Mitigation Measures:<br>• Rehabilitation in accordance with the Rehabilitation Plan for the development must be undertaken in areas disturbed during the decommissioning phase as developed by a specialist. | | | | | | | | | | | | | |

### 8.1.4 Impacts on Soil and Agriculture

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

The compliance statement confirms that through a combination of desktop data and collated baseline information the overall sensitivity for the development area is of moderate sensitivity and low sensitivity. The "L4" land potential is characterised by moderate potential and is arable, and it is characterised with a "Moderate" sensitivity. The "L5" land potential is characterised by restricted land potential and classes as non-arable, with a "Low" sensitivity.

Despite considerable portions of the development area coinciding with delineated crop field areas, it was apparent from the assessment that these areas are not actively cultivated for the Acrux Solar PV Project One development area. Further to this, no irrigation infrastructure, such as centre pivots or drip irrigation are present within the development area and irrigated agricultural is currently not practiced in the area.

Considering the soil properties, agricultural potential as well as the current land use of the development area associated with the PV project components, the area has a "Medium" agricultural sensitivity.

In terms of the grid connection corridor under assessment, the agricultural sensitivity is also a function of the severity of the impact which that development poses to agriculture. This impact is negligible for overhead transmission power lines. Based on this, the agricultural sensitivity for the transmission line is considered to be "Low". Power lines pose negligible impacts to agriculture for the following reasons:

- Agricultural activities which include crop cultivation and livestock grazing can continue below the power lines; and
- Direct disturbances to agricultural activities are restricted to the footprint area of pylon / tower bases.

Based on the confirmed sensitivities, the overall sensitivity of the proposed project area can be categorized as "Medium".

Further to the above the compliance statement considers allowable development limits which refers to the area of a particular land capability that can be directly impacted by a renewable energy development. The limits were determined for the proposed 320 ha development

footprint, with the allowable limits outside crop field boundaries uses (medium sensitivity). The proposed development footprint (320 ha) exceeds the allowable limit of 112 ha, however the exceedance is considered acceptable as the crop fields are not actively cultivated, with a moderate to restricted agricultural potential.

Considering the above, the specialist has provided management and mitigation measures for implementation:

- Vegetation clearance must be restricted to areas authorised for development;
- Land clearing and preparation may only be undertaken immediately prior to construction activities and within authorised areas;
- A stormwater management plan must be developed and implemented for the project; and
- If soil erosion is detected, the area must be stabilised using geo-textiles and facilitated re-vegetation.

To conclude the above, the specialist states that the development of Acrux Solar PV Project One and the associated infrastructure will have an acceptable negative impact on the agricultural production capability of the area. This is based on:

- The land capability of the area ranges from very low to moderate;
- The agricultural potential of the area ranges from low to restricted;
- The delineated crop fields for the PV area are not cultivated;
- The agricultural sensitivity for the area ranges from medium (for the PV area) to low (for the transmission line); and
- The agricultural impacts associated with the transmission line are expected to be negligible.

Development of the crop fields is permissible, and it is recommended that alternative crops perhaps be considered for the developed PV areas, if feasible. An agreement between the applicant and landowner must be completed for the development of the crop areas, despite these areas not being actively cultivated.

For the transmission lines, it is recommended to keep the number of tower / pylon bases to an absolute and feasible minimum to minimise the disturbance to agricultural activities.

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

### 8.1.5 Impacts on the Visual Landscape

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

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

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

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

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

During the operation phase, most impacts will be of a medium significance, with some of a low significance prior to the implementation of the recommended mitigation measures. The significance of most impacts during operation following the implementation of the recommended mitigation measures will be reduced to a low significance, with some impacts still having a medium impact significance, however with a lower impact significance rating.

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

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

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

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual impact of construction activities on sensitive visual receptors: Solar PV Project | Before mitigation | Negative | 2 | 4 | 1 | 2 | 1 | 4 | 2 | 28 | Low (6-28) | Yes | Yes |
| | After mitigation | Negative | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 24 | Low (6-28) | | |

Mitigation Measures:

<u>Planning:</u>

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

<u>Construction:</u>

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

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual impact of construction activities on sensitive visual receptors: Grid Connection | 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:

<u>Planning:</u>

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

| 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 PV Project | Before mitigation | Negative | 2 | 4 | 4 | 2 | 3 | 4 | 2 | 38 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 30 | Medium (29-50) | | |
| Mitigation Measures:<br><br>Planning:<br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• Where insufficient natural vegetation exists next to the property, a 'screen' can be planted if the landowner requests additional mitigation. This can be done using endemic, fast growers that are water efficient. Additionally, placed in an optimal position to create a screening effect and limit shading on nearby panels.<br><br>Operation:<br><br>• Maintain general appearance of the facility as a whole. | | | | | | | | | | | | | |

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

| 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 | Before mitigation | Negative | 2 | 4 | 4 | 2 | 3 | 3 | 2 | 38 | Medium (29-50) | Yes | Yes |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1km radius: Grid Connection Infrastructure | After mitigation | Negative | 2 | 4 | 2 | 2 | 3 | 3 | 2 | 32 | Medium (29-50) | | |
| Mitigation Measures:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the infrastructure as a whole. | | | | | | | | | | | | | |

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

| 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 PV Project | Before mitigation | Negative | 2 | 3 | 4 | 2 | 3 | 3 | 2 | 34 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 28 | Low (6-28) | | |
| Mitigation Measures:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the facility as a whole. | | | | | | | | | | | | | |

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

| 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 | Before mitigation | Negative | 2 | 3 | 4 | 2 | 3 | 3 | 2 | 34 | Medium (29-50) | Yes | Yes |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a 1km and 3km radius: Grid Connection Infrastructure | After mitigation | Negative | 2 | 3 | 2 | 2 | 3 | 3 | 2 | 30 | Medium (29-50) | | |
| Mitigation Measures:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the facility as a whole. | | | | | | | | | | | | | |

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

| 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 3km and 5km radius: Solar PV Project | Before mitigation | Negative | 2 | 2 | 4 | 2 | 3 | 3 | 2 | 32 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 26 | Low (6-28) | | |
| Mitigation Measures:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the facility as a whole. | | | | | | | | | | | | | |

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

| 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 3km and 5km radius: Grid Connection Infrastructure | 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:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the infrastructure as a whole. | | | | | | | | | | | | | |

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

| 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 5km and 10km radius: Solar PV Project | Before mitigation | Negative | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 13 | Low (6-28) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 1 | 1 | 3 | 2 | 1 | 11 | Low (6-28) | | |
| Mitigation Measures:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• Maintain general appearance of the facility as a whole. | | | | | | | | | | | | | |

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

| 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 5km and 10km radius: Grid Connection Infrastructure | 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:<br><br><u>Planning:</u><br><br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint.<br>• 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.<br><br><u>Operation:</u><br><br>• - Maintain general appearance of the infrastructure as a whole. | | | | | | | | | | | | | |

**Table 8.32:** Visual Impact during operation due to lighting at night.

| 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 | 3 | 4 | 3 | 48 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 1 | 1 | 1 | 3 | 2 | 2 | 20 | Low (6-28) | | |
| Mitigation Measures:<br><br><u>Planning and Operation:</u><br><br>• As far as practically possible:<br>o Shield the source of light by physical barriers (walls, vegetation etc.)<br>o Limit mounting heights of lighting fixtures, or alternatively use footlights or bollard level lights.<br>o Make use of minimum lumen or wattage in fixtures.<br>o 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 8.33:** Visual Impact during operation due to solar glint and glare as a visual distraction.

| 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 | Yes |
| | After mitigation | Negative | 2 | 1 | 1 | 1 | 3 | 1 | 2 | 18 | Low (6-28) | | |
| Mitigation Measures:<br>• No mitigation measures are required. | | | | | | | | | | | | | |

**Table 8.34:** Visual Impact during operation on the sense of place due to the Solar PV Project.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual impacts on sense of place associated with the operational phase: Solar PV Project | Before mitigation | Negative | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 30 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 2 | 1 | 3 | 3 | 2 | 1 | 13 | Low (6-28) | | |
| Mitigation Measures:<br>• The subjectivity towards the project in its entirety can be influenced by implementing public awareness campaigns.<br>• Implement good housekeeping measures. | | | | | | | | | | | | | |

**Table 8.35:** Visual Impact during operation on the sense of place due to the Grid Connection Infrastructure.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual impacts on sense of place associated with the operational phase: Grid Connection Infrastructure | 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:<br>• The subjectivity towards the project in its entirety can be influenced by implementing public awareness campaigns.<br>• Implement good housekeeping measures. | | | | | | | | | | | | | |

### 8.1.6 Impacts on the Social Environment

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

This SIA 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 One. Secondary data was collected and presented in a literature review and primary data was collected through consultations with affected and adjacent landowners and key stakeholders. The environmental assessment framework for assessment of impacts and the relevant criteria were applied to evaluate the significance of the potential impacts.

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

Potential negative social impacts can be associated with the construction phase of the Acrux Solar PV Project One, 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.

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

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

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

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

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

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

**Table 8.36:** Direct and indirect employment opportunities and skills development 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 enhancement | Positive | 2 | 4 | 1 | 1 | 1 | 2 | 2 | 22 | Low (6-28) | Yes | Yes |
| | After enhancement | Positive | 2 | 4 | 1 | 1 | 1 | 3 | 3 | 36 | Medium (29-50) | | |
| Enhancement:<br>• A local employment policy should be adopted to maximise opportunities made available to the local labour force.<br>• 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.<br>• Where feasible, training and skills development programmes should be initiated prior to the commencement of the construction phase.<br>• As with the labour force, suppliers should also as far as possible be sourced locally.<br>• Where feasible, local contractors that are compliant with Broad-Based Black Economic Empowerment (B-BBEE) criteria should be used.<br>• The recruitment selection process should seek to promote gender equality and the employment of women wherever possible. | | | | | | | | | | | | | |

**Table 8.37:** 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 enhancement | Positive | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 18 | Low (6-28) | Yes | Yes |
| | After enhancement | Positive | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 36 | 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 8.38**: Potential 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:<br>• The proposed site for the Acrux Solar PV Project One needs to be fenced off prior to the construction phase and all construction related activities should be confined in this fenced off area.<br>• Livestock grazing on the proposed development footprint area need to be relocated.<br>• 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).<br>• Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints.<br>• Mitigation measures from the Agricultural and Soil Report, should also be implemented. | | | | | | | | | | | | | |

**Table 8.39:** Influx of jobseekers and change in population 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 | Before mitigation | Negative | 2 | 2 | 4 | 3 | 4 | 3 | 2 | 36 | Medium (29-50) | Yes | Yes |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| resultant change in population, and increase in pressure on local resources and social networks, or existing services and infrastructure | After mitigation | Negative | 2 | 2 | 4 | 3 | 3 | 2 | 1 | 16 | Low (6-28) | | |
| Mitigation Measures:<br>• Develop and implement a local procurement policy which prioritises "locals first" to prevent the movement of people into the area in search of work.<br>• Engage with local community representatives prior to construction to facilitate the adoption of the locals first procurement policy.<br>• 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.<br>• Working hours should be kept between daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities.<br>• Compile and implement a grievance mechanism.<br>• Appoint a Community Liaison Officer (CLO) to assist with the procurement of local labour.<br>• Prevent the recruitment of workers at the project site.<br>• Implement, manage and monitor a grievance mechanism for the recording and management of social issues and complaints.<br>• Establish clear rules and regulations for access to the proposed site.<br>• Appoint a security company and implement appropriate security procedures to ensure that workers do not remain onsite after working hours.<br>• Inform local community organisations and policing forums of construction times and the duration of the construction phase.<br>• Establish procedures for the control and removal of loiterers from the construction site. | | | | | | | | | | | | | |

**Table 8.40:** Safety and security impacts during construction.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temporary increase in safety and security concerns associated with the influx of people during the construction phase | Before mitigation | Negative | 2 | 3 | 1 | 1 | 1 | 3 | 3 | 33 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 1 | 1 | 1 | 1 | 2 | 3 | 24 | Low (6-28) | | |
| Mitigation Measures:<br>• Working hours should be kept within daylight hours during the construction phase, and / or as any deviation that is approved by the relevant authorities if required.<br>• If possible, provide transportation for workers to prevent loitering within or near the project site outside of working hours.<br>• 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 by the EPC.
- 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, in consultation with the CLO, 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 8.41:** Impacts on daily living and movement patterns during construction.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temporary increase in traffic disruptions and movement patterns during the construction phase | Before mitigation | Negative | 2 | 3 | 2 | 2 | 1 | 2 | 4 | 48 | Medium (29-50) | Yes | Yes |
| | After mitigation | Negative | 2 | 3 | 2 | 1 | 1 | 2 | 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 8.42:** Nuisance impacts during construction phase.

| 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:<br>• The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible.<br>• 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.<br>• Ensure all vehicles are road worthy, drivers are qualified and are made aware of the potential noise and dust issues.<br>• A CLO should be appointed, and a grievance mechanism implemented. | | | | | | | | | | | | | |

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

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 20 | Low (6-28) | | |
| Mitigation Measures:<br>• A firebreak should be implemented before the construction phase. The firebreak should be controlled and implemented around the perimeters of the project site. | | | | | | | | | | | | | |

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

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

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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:<br>• Implement mitigation measures identified in the Visual Impact Assessment (VIA) prepared for the project.<br>• To the extent possible, limit noise generating activities to normal daylight working hours and avoid weekends and public holidays.<br>• The movement of heavy vehicles associated with the construction phase should be timed to avoid weekends, public holidays, and holiday periods where feasible.<br>• 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.<br>• 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.<br>• Communication, complaints, and grievance channels must be implemented, and contact details of the CLO must be provided to the local community in the study area. | | | | | | | | | | | | | |

**Table 8.45:** Direct and indirect employment opportunities and skills development during operation.

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

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| skills development opportunities during the operation phase for the country and local economy | After enhancement | Positive | 3 | 4 | 4 | 1 | 3 | 3 | 2 | 36 | Medium (29-50) | | |
| Enhancement:<br>• It is recommended that local employment policy is adopted to maximise the opportunities made available to the local community.<br>• The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.<br>• Vocational training programs could be established to promote the development of skills, or other investments in local skills development, education and/or local enterprise development initiatives. | | | | | | | | | | | | | |

**Table 8.46:** Development of Non-Polluting, Renewable Energy Infrastructure During Operation.

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

**Table 8.47:** Potential loss of agricultural land during operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 3 | 2 | 2 | 22 | Low (6-28) | | |

Mitigation Measures:

- Proposed mitigation measures of the construction phase should have been implemented at this stage.
- Mitigation measures from the Agricultural and Soil Compliance Statement should also be implemented.

**Table 8.48:** Contribution to Local Economic Development (LED) and Social Upliftment during operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated / enhanced? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Contribution to LED and social upliftment during the operation of the project | Before enhancement | Positive | 4 | 4 | 2 | 1 | 3 | 2 | 3 | 48 | Medium (29-50) | Yes | Yes |
| | After enhancement | 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 8.49:** Impact on tourism during operation.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated / enhanced? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The potential impact on tourism due to the establishment of the Solar PV Project | 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:

- 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.

**Table 8.50:** 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:<br>• To effectively mitigate the visual impact and the impact on sense of place during the operational phase of the proposed Acrux Solar PV Project One, it is suggested that the recommendations made in the Visual Impact Assessment (specialist study) should be followed in this regard. | | | | | | | | | | | | | |

### 8.1.7 Impacts on Heritage Resources

A Heritage Impact 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.

From a review of available databases, publications, as well as available heritage impact assessments done for the purpose of developments in the region it was determined that the Acrux One site is in an area with a low presence of heritage sites and features. Reports indicate that stone tools, mostly dating to the Early or Middle Stone Age, occur in low densities sporadically across the larger region. Historic structures, inclusive of buildings, monuments and bridges, occur sporadically across the larger region. Formal and informal burial sites occur sporadically throughout the region.

During the survey no sites, features or objects of cultural significance dating to the Stone Age or Iron Age were identified. In terms of the historic period of the development area, a burial site has been identified along the most southeastern corner of the development area. This seems to be a very old and neglected burial site as there are no indications of recent visits by descendants. Due to the dense vegetation cover and the neglected state of the burials, it was impossible to obtain details such as the number of graves or of the people who were buried there. Burial sites are viewed as having high emotional and sentimental value. However, mitigation is possible if proper procedures have been followed.

It is confirmed however that the burial site is located outside of the development footprint of the PV facility but falls within the grid connection corridor.

For the development area, the impacts to heritage sites are expected to be of low significance. This can be further reduced by implementing mitigation measures, include isolating sites, relocating sites (e.g. burials) and excavating or sampling any significant archaeological material found to occur within the project area. The chances of further such material being found, however, are considered to be negligible. After mitigation, the overall impact significance would therefore be low.

The specialist has indicated that from a heritage point of view, it is recommended that the Acrux Solar PV Project One be allowed to continue on acceptance of the conditions proposed below.

The potential impacts to the loss of heritage resources are assessed below in Tables 8.51.

**Table 8.51:** Impact to the burial site.

| 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? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Although this site is located in an area that has already been excised from the project area, it is close to the proposed power line therefore there is a possibility that it might accidently be damaged. | Before mitigation | Negative | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 24 | Low (6-28) | Yes | Yes |
| | After mitigation | Negative | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | Low (6-28) | | |

Mitigation Measures:

- (1) Avoidance/Preserve: This is viewed to be the primary form of mitigation and applies where any type of development occurs within a formally protected or significant or sensitive heritage context and is likely to have a high negative impact. This measure often includes the change / alteration of development planning and therefore impact zones in order not to impact on resources.
- The burial site must be fenced off with wire or danger tape with a buffer zone of at least 50m for the duration of the construction activities.
- In the event of an impact occurring on the identified burial site, a permit for mitigation and/or destruction must be obtained from SAHRA/PHRA prior to any work being carried out. The appropriate steps to take are indicated in Section 9 of the Heritage Impact Assessment, as well as in the Management Plan: Burial Grounds and Graves, with reference to general heritage sites, in the Addendum, Section 13.5 of the Heritage report.

Other management measures include:

- Known sites (where discovered) must be clearly marked, so that they can be avoided during construction activities.
- The contractors and workers must be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, must cease immediately and the Environmental Control Officer (ECO) shall be notified as soon as possible.
- All discoveries must be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the ECO must advise the necessary actions to be taken.
- Under no circumstances must any artefacts be removed, destroyed or interfered with by anyone on the site.
- Contractors and workers must be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the NHRA, Section 51(1).
- A person or entity, e.g. the ECO, must be tasked to take responsibility for the maintenance heritage sites (where present).
- In areas where the vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it must be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official must be part of the team executing these measures.

- The assessment has determined that sites, features or objects of heritage significance occur in the site. Therefore, relevant permits might be required from SAHRA or the PHRA, if avoidance is not adhered to.
- If heritage features are identified during construction, as stated in the management recommendations, these finds must be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

### 8.1.8 Impacts on Palaeontology

The proposed Acrux Solar PV Project One is underlain by Jurassic dolerite, Balfour Formation (Adelaide Subgroup, Beaufort Group, Karoo Supergroup) as well as the Tierberg Formation of the Ecca Group. 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, while that of the Tierberg Formation (Ecca Group) is Moderate. Jurassic dolerite is igneous in origin, unfossiliferous and has a Zero Palaeontological Sensitivity (Almond and Pether, 2009; Almond et al., 2013).

A site-specific field survey of the development footprint was conducted on foot and by motor vehicle on 15-16 March 2023 as part of the Palaeontological Impact Assessment. No fossiliferous outcrop was detected in the development area. 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 Palaeosensitivity Map and DFFE Screening Tool.

A High 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 development will not lead to damaging impacts on the palaeontological resources of the area. The construction of the development may therefore 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.

The palaeontological impacts are assessed below in Tables 8.52.

**Table 8.52:** Palaeontological impacts associated with the construction phase of Acrux Solar PV Project One.

| 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 | - | 4 | 4 | 4 | 2 | 4 | 60 | High (51-73) | Yes | Yes |
| | After mitigation | Negative | 1 | - | 4 | 4 | 4 | 2 | 1 | 15 | Low (6-28) | | |
| Mitigation Measures:<br>• If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol (section 11 of the Palaeontological Impact Assessment) 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.<br>• 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 Concluding Statement on the Impact Assessment

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

Majority of the negative impacts have been identified as being of a medium significance before the implementation of recommended mitigation measures and can in most instances be reduced to a low impact significance.

Limited impacts of high significance have been identified specifically for impacts relating to ecology, avifauna and palaeontology, however with the implementation of the recommended mitigation measures the impact significance is reduced to either a low or medium significance which is considered to be an acceptable reduction of the impact significance.

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

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(h)(v) a full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: (v) the impacts and risks identified, including the nature, significance, consequence extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed; (bb) may cause irreplaceable loss 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 One is considered in section 8.1. This includes the details of the impact nature, significance, consequence extent, duration and probability of the impacts, including the degree to which these impacts can be reversed; may cause irreplaceable loss pf resources; and can be avoided, managed or mitigated. |

| | |
|---|---|
| 3(1)(h)(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. | The potential positive and negative impacts and risks identified to be associated with the development of the Acrux Solar PV Project One is considered in section 8.1. These impacts have been identified from the inputs provided by the various independent specialist reports included in Appendix E. |
| 3(1)(h)(viii) the possible mitigation measures that could be applied and the level of residual risk. | Mitigation measures and recommendations for the management of the potential impacts and environmental sensitivities have been included in section 8.1. |
| 3(1)(i)(i) a full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process. | The potential impacts, risks and issues identified to be associated with the development of Acrux Solar PV Project One is considered in section 8.1. |
| 3(1)(i)(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures. | Each impact has been assessed in section 8.1 which provides an indication of the impact significance with mitigation and without mitigation. |
| 3(1)(j) an assessment of each identified potentially significant impact and risk, including (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk | The potential impacts and risks identified to be associated with the development of Acrux Solar PV Project One is considered in section 8.1. This includes the details of the impact nature, significance, consequence extent, duration and probability of the |

| | |
|---|---|
| occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be mitigated. | impacts, including the degree to which these impacts can be reversed; may cause irreplaceable loss pf resources; and can be avoided, managed or mitigated. |
| 3(1)(k) where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 of these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report. | A summary of the findings and recommendations from each specialist report is included in section 8.1. |
| 3(1)(m) based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation. | The recommendations from the specialist reports for Acrux solar PV Project One is included in section 8.1. |

# 9 CUMULATIVE IMPACT ASSESSMENT

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

A geographic area must be determined within which the 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 on agriculture, natural grazing and urban development (town of Bloemfontein).

## 9.1 Process followed for the identification and assessment of cumulative impacts

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

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

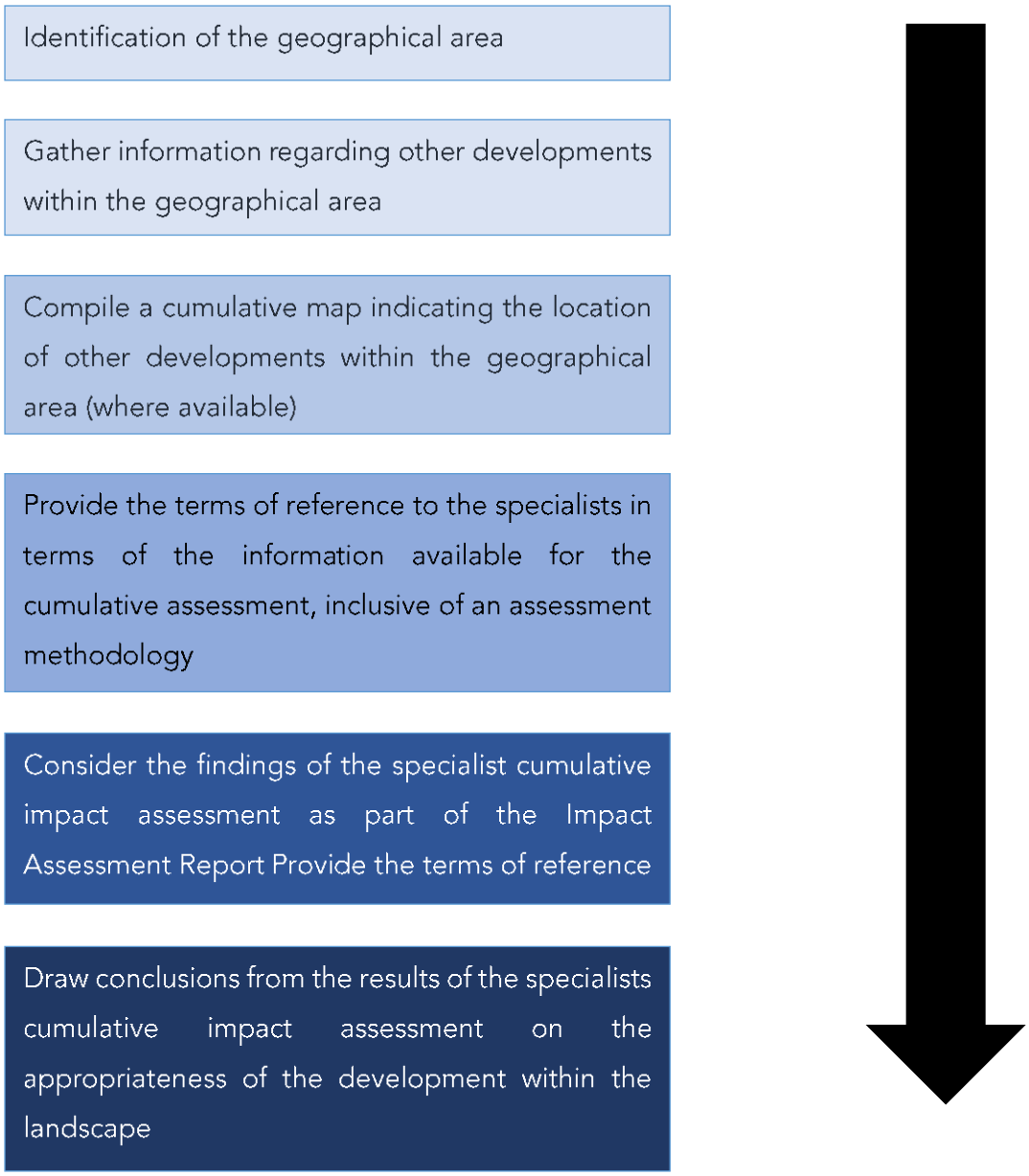


**Figure 9.1:** Process flow indicating the process followed for the assessment of cumulative impacts.

## 9.2 Other Developments within the area

Acrux Solar PV Project One is proposed in an area which has historically been used for agricultural activities with the site being specifically used for natural grazing at present and has historically been used for crop production. The Bloemfontein area and its surrounds (within which Acrux Solar PV Project One is proposed) receives a suitable annual amount of solar radiation which is considered appropriate for the development of solar energy facilities. It can therefore be expected that the area will be developed for solar energy facilities, adding to the cumulative impact of the overall area.

Table 9.1 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 and the Applicant. Also refer to Figure 9.1.

**Table 9.1:** Renewable Energy Developments Located within a 30 km radius of the Acrux Solar PV Project One.

| Project name | Distance | Capacity (MW) | DFFE reference | EIA process | Project status |
|---|---|---|---|---|---|
| Projects included in the REEA database (May 2023) | | | | | |
| Jedwater Solar Power Facility | 18 km | 164 | 12/12/20/1972 | Scoping and EIA | Approved |
| SSS1 5MW Solar PV Power Plant | 2.7 km | 5 | 14/12/16/3/3/1/1092 | BAR | Approved |
| SSS1 5MW Solar PV Power Plant | 2.7 km | 5 | 14/12/16/3/3/1/1093 | BAR | Approved |
| Solaire Direct Glen Thorne Solar PV Facility | 14 km | 10 | 14/12/16/3/3/1/455 | BAR | In process |
| Farm Mara No. 2571 PV Solar Facility | 29 km | 15 | 14/12/16/3/3/1/564 | BAR | Approved |
| Portion 1 and Portion 9 | 0.7 km | 75 | 14/12/16/3/3/2/641 | Scoping and EIA | Approved |

| | | | | | |
|---|---|---|---|---|---|
| Spes Bona PV Solar Facility | | | | | |
| Sonneblom photovoltaic solar energy facility | 29 km | 84 | 14/12/16/3/3/2/673 | Scoping and EIA | Approved |
| Serurubele photovoltaic solar energy facility | 30 km | 84 | 14/12/16/3/3/2/675 | Scoping and EIA | Approved |
| Steenbok Solar 1, Steenbok Solar 2 and Steenbok Grid Connection | 20km | 35 MW each | 14/12/16/3/3/2/2235 | Scoping and EIA | Approved |
| Projects not included in REEA database or Applications in process | | | | | |
| Acrux Solar PV Project Two | < 1 km | 650 | 14/12/16/3/3/2/2390 | Scoping and EIA | In process |
| Mira Solar PV Project One | 10 km | TBC | TBC | Scoping and EIA | In process |

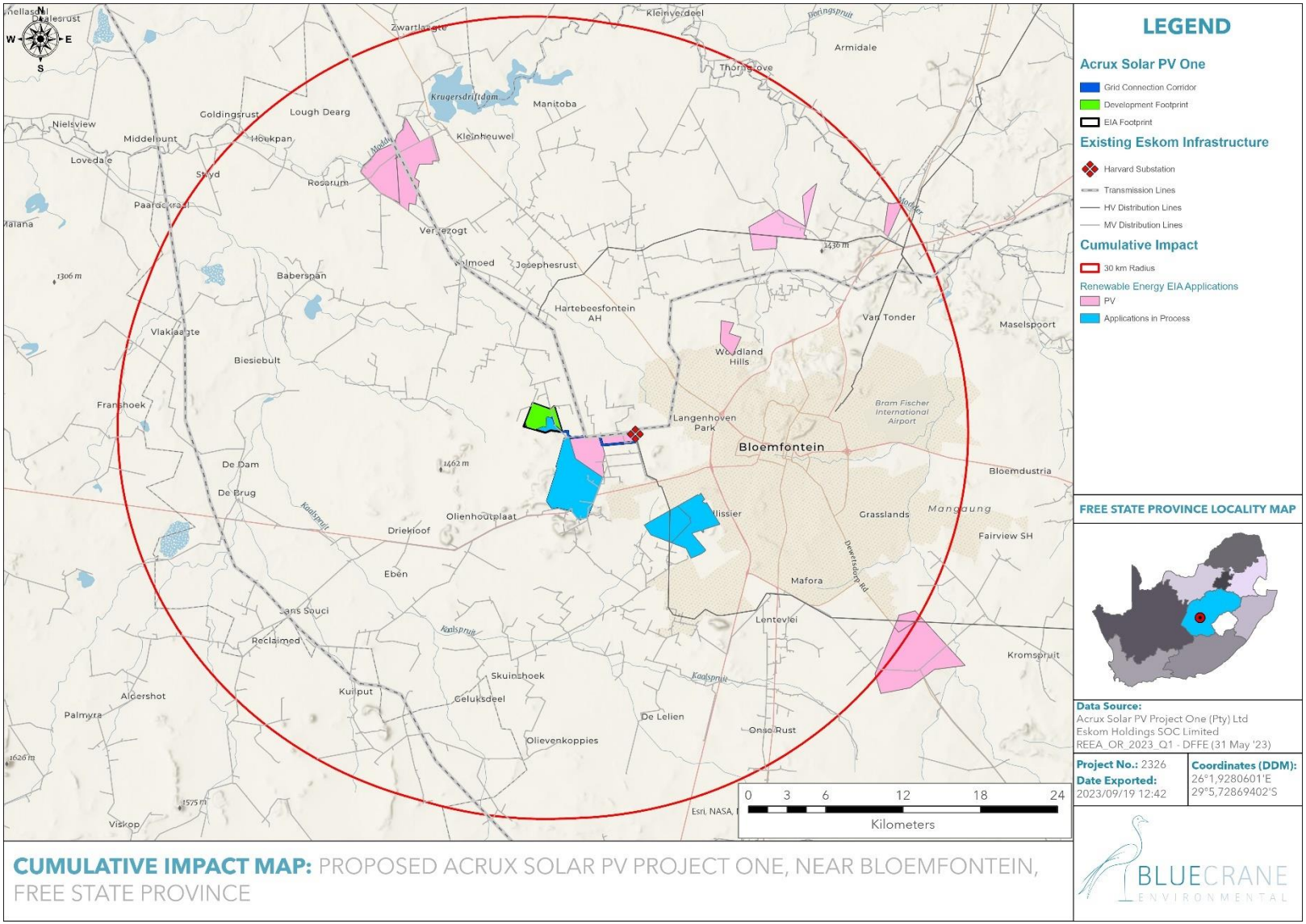


Figure 9.2: Cumulative Map of the Acrux Solar PV Project One.

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 to freshwater resources;
- 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 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 and wetland 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 impacts 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 – 25 years) and subsequently the impact is also expected to be long-term.

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.

## 9.3 Specialist input

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

It must be noted that cumulative impacts have not been identified from a soils and agricultural perspective as the specialist confirmed that only a compliance statement would be required considering the development area associated with Acrux solar PV Project One. The compliance statement indicates that an Agricultural Compliance Statement is not required to complete an impact assessment, but where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr must be provided – which has been provided and included in the draft EIA Report accordingly.

### 9.3.1 Terrestrial Ecology

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent reserves.

In order to spatially quantify the cumulative effects of the Acrux Solar PV Project One, the project in isolation is compared with the overall effects of surrounding development (including total transformation and transformation as a result of new and proposed developments of a similar type, i.e., solar).

According to the 2018 National Biodiversity Assessment, the total amount of habitat within 30 km of the project amounts to 345 561,274 ha, but when considering the transformation that has taken place within this radius – only 189 094,107 ha remains. Therefore, the area within 30 km of the Acrux Solar PV Project One has experienced approximately 45,28 % loss in natural habitat. Considering this context, the project footprint is 320 ha (assuming the total extent of the project area is developed), and seven (7) additional similar project exists in the 30 km region measuring a maximum of 6168,319 ha (as per the latest South African Renewable Energy EIA Application Database). This means that the total amount of remaining habitat lost as a result of solar projects in the region amounts to 3,44 % (the sum of all related developments as a percentage of the total remaining habitat).

Approximately 45,28 % of natural habitat has been lost, and as discussed above the proposed Acrux Solar PV Project One will result in a further loss of approximately 3.44 % from only

similar developments (Solar) in the area, as such the cumulative impact from the proposed development is rated as "moderately high". It is imperative that careful spatial management and planning of the entire region be a priority, and existing large infrastructure projects must be carefully monitored over the long term.

Refer to Table 9.2 below for the cumulative impact assessment.

**Table 9.2:** Terrestrial ecology cumulative impact assessment.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Loss of functional habitat corridors and wetland habitat connectivity | Impact in isolation | Negative | 1 | 3 | 2 | 3 | 2 | 2 | 1 | 13 | Low (6-28) | Yes | Yes |
| | Cumulative impact | Negative | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 36 | Medium (29-50) | | |
| Mitigation Measures:<br>• Demarcate areas to be developed.<br>• Avoid all sensitive environmental features. | | | | | | | | | | | | | |

### 9.3.2 Wetland Ecology

Localised cumulative impacts include those from operations that are close enough (within 30 km) to potentially cause additive effects on the local environment or any sensitive receptors (relevant operations include nearby large road networks, other solar PV facilities, and power infrastructure). Relevant impacts include the overall reduction of wetland habitat, disruption of ecological corridors provided by watercourses and wetlands, alteration of groundwater and surface water quantity and quality, subsequent erosion and downstream deposition.

The South African Inventory of Inland Aquatic Ecosystems (2018), together with the National Freshwater Ecosystem Priority Areas Wetlands (2011) was used to establish the baseline of the current functional wetland habitat within a 30 km radius of Acrux Solar PV Project One. The overlap of wetland features between the two databases was considered, and where overlaps did exist the areas of the said features were differenced to avoid an overestimation of wetland habitat.

Long-term cumulative impacts due to the proposed electricity generation adjacent to the watercourses, in combination with agricultural activities currently present in the surrounding catchment has the potential to degrade watercourse habitat across the catchment.

It should however be noted that total transformation and subsequent loss of natural wetland habitat and ecological functioning is the worst-case scenario, and the proposed developments can mitigate against this with the avoidance of wetland habitat on a site-specific. Residual impacts to the wetland resources will then be likely, which provides the opportunity for rehabilitating the water resources and essentially improving upon the current ecological functioning of the systems. In terms of the Acrux Solar PV Project One, the delineated wetlands have been avoided by the preferred development footprint.

The total wetland habitat associated with the 30 km radius amounts to 9822 ha. Similar projects within the 30 km radius were identified using the South African Renewable Energy EIA Application Database. Furthermore, with data refinements the total wetland habitat within the footprints of other applications in process and specifically within the Acrux Solar PV Project One footprint was calculated to be 18.04 ha and 1.02 ha, respectively. It is anticipated that no wetland loss will occur for the Acrux Solar PV Project One as the wetlands have been avoided by the preferred development footprint. Under the assumption of complete transformation, the cumulative wetland habitat loss of 0.19% is expected for the Acrux Solar PV Project One and other applications in process. In consideration of the

surrounding solar projects the cumulative total of habitat loss was calculated to be 2.25% (the sum of all related developments as a percentage of the total wetland habitat within a 30 km radius), assuming that the wetlands are not avoided on a site-specific level.

In consideration of the cumulative loss percentages, the cumulative impact from the proposed Acrux Solar PV Project One is rated as "Low" as the calculations yield a percentage less than one (1). The percentage of cumulative loss is expected to decrease further given the avoidance of the wetland habitat by the Acrux Solar PV Project One. When similar projects within the area are considered, the cumulative impact is higher although, may be attributed to the presence of more or larger wetlands that are intersected by an overall larger project area (that being the collective of other solar projects within 30 km of the Acrux Solar PV Project One). Even where wetland areas are avoided and only low to moderate residual risks are potential to the water resources, it remains imperative that careful spatial management and planning of the entire region be a priority and, existing large infrastructure projects must be carefully monitored over the long term.

### 9.3.3 Avifauna

Long-term cumulative impacts associated with the site development activities can lead to the loss of endemic and threatened species, including natural habitat and vegetation types, and these impacts can even lead to the degradation of conserved areas such as the adjacent reserves.

In order to spatially quantify the cumulative effects of the Acrux Solar PV Project One, the project in isolation is compared with the overall effects of surrounding development (including total transformation and transformation as a result of new and proposed developments of a similar type, i.e., solar).

According to the 2018 National Biodiversity Assessment, the total amount of habitat within 30 km of the project amounts to 345 561,274 ha, but when considering the transformation that has taken place within this radius – only 189 094,107 ha remains. Therefore, the area within 30 km of the project has experienced approximately 45,28 % loss in natural habitat. Considering this context, the project footprint is 320 ha (assuming the total extent of the project area is developed), and seven (7) additional similar project exists in the 30 km region measuring a maximum of 6168,319 ha (as per the latest South African Renewable Energy EIA Application Database). This means that the total amount of remaining habitat lost as a result

of solar projects in the region amounts to 3,44 % (the sum of all related developments as a percentage of the total remaining habitat).

Approximately 45,28 % of natural habitat has been lost, and as discussed above the proposed development will result in a further loss of approximately 3.44 % from only similar developments (Solar) in the area, as such the cumulative impact from the Acrux Solar PV Project One is rated as "moderately high". It is imperative that careful spatial management and planning of the entire region be a priority, and existing large infrastructure projects must be carefully monitored over the long term.

Refer to Table 9.3 below for the cumulative impact assessment.

**Table 9.3:** Avifauna cumulative impact assessment.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Loss of habitat, and disruption of surrounding ecological corridors. As well as the influences of pollution (water, noise, air, etc.). | Impact in isolation | Negative | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 26 | Low (6-28) | Yes, through site specific mitigation per facility | Yes |
| | Cumulative impact | Negative | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 48 | Medium (29-50) (moderately high) | | |
| Mitigation Measures:<br>• None identified by the specialist | | | | | | | | | | | | | |

### 9.3.4 Visual

The Acrux Solar PV Project One is located in a close proximity to intensive urban development and might have a cumulative impact on viewers. Other solar facilities are also proposed in the area and the potential for cumulative impacts to occur as a result of the projects is therefore highly likely. Permanent residents of the area might be desensitised over time with the construction of more solar facilities, but will stay subjective for each viewer. Although the cumulative impact might be high if all proposed projects be constructed, the location of the solar facilities within the geographical area will contribute to the consolidation of solar PV structures to this locality and avoid a potentially scattered proliferation of solar energy infrastructure throughout the region. Residents of the area might already be desensitised to a variety of developments due to the large-scale urban development in close proximity to the Acrux Solar PV Project One. Large scale urban development, in this case the larger Mangaung Metropolitan area, also includes intensive industrial development.

The anticipated cumulative visual impact for the Acrux Solar PV Project One is expected to include the change in sense of place, as well as the precedent being set for Solar PV projects in the area where currently there is only a precedent for agricultural developments to the west of Bloemfontein. The construction and operation of Acrux Solar PV Project One in the area is likely to have a negative impact.

Refer to Table 9.4 below for the cumulative impact assessment.

**Table 9.4:** Visual cumulative impact assessment.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| The anticipated cumulative impact is expected to include the change in sense of place, as well as the precedent being set for Solar PV projects in the area where currently there is only a precedent for agricultural developments to the west of Bloemfontein. | Impact in isolation | Negative | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 26 | Low (6-28) | Yes | Yes, considering the disturbed landscape within which the development is proposed. |
| | Cumulative impact | Negative | 2 | 4 | 4 | 3 | 3 | 3 | 3 | 57 | High (51-73) | | |
| Mitigation Measures:<br>• Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint / servitude. | | | | | | | | | | | | | |

### 9.3.5 Social

Acrux Solar PV Project One and the establishment of other solar power projects within the area has the potential to result in significant positive cumulative impacts, specifically with regards to the creation of a number of socio-economic opportunities for the region, which in turn, can result in positive social benefits. The positive cumulative impacts include creation of employment, skills development and training opportunities, and downstream business opportunities. The cumulative benefits to the local, regional, and national economy through employment and procurement of services are more considerable than that of Acrux Solar PV Project One alone.

Further to the above, negative cumulative social impacts may occur, specifically, as there are multiple proposed solar energy developments in the area which may result in a large-scale in-migration of people to the area.

While the development of a single solar PV project may not result in a major influx of people into an area, the development of several projects may have a cumulative impact on the in-migration and movement of people. In addition, the fact that the project is proposed within an area characterised by good levels of solar irradiation suitable for the development of commercial solar energy facilities implies that the surrounding area is likely to be subject to considerable future applications for PV energy facilities. Levels of unemployment, and the low level of earning potential may attract individuals to the area in search of better employment opportunities and higher standards of living.

It is exceedingly difficult to control an influx of people into an area, especially in a country where unemployment rates are high. It is therefore important that the project proponent implement and maintain strict adherence with a local employment policy in order to reduce the potential of such an impact occurring.

The significance of the positive cumulative impact will be of a high significance and the significance of the negative cumulative impact will be of a medium significance.

Refer to Tables 9.5 and 9.6 below for the cumulative impact assessment.

**Table 9.5:**Social cumulative impact from employment, skills and business opportunities.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| An increase in employment opportunities, skills development and business opportunities with the establishment of more than one solar power facility. | Impact in isolation | Positive | 3 | 3 | 1 | 1 | 3 | 2 | 3 | 39 | Medium (29-50) | Yes | Yes. |
| | Cumulative impact | Positive | 3 | 4 | 1 | 1 | 3 | 2 | 4 | 56 | High (51-73) | | |
| Enhancement Measures:<br>• The establishment of several solar power projects under the REIPPP Programme in the area has the potential to have a positive cumulative impact on the area in the form of employment opportunities, skills development and business opportunities. The positive benefits will be enhanced if local employment policies are adopted, and local services providers are utilised by the developers to maximise the project opportunities available to the local community. | | | | | | | | | | | | | |

**Table 9.6:**Social cumulative impact from large-scale in-migration of people.

| Nature of the Impact | Status | | Extent | Probability | Reversibility | Irreplaceability | Duration | Cumulative Effect | Magnitude | Impact Significance | Impact Rating | Can impact be mitigated? | Is the impact acceptable? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Negative impacts and change to the local economy with an in-migration of labourers, businesses and jobseekers to the area. | Impact in isolation | Negative | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 9 | Low (6-28) | Yes | Yes |
| | Cumulative impact | Negative | 3 | 3 | 1 | 1 | 3 | 3 | 3 | 39 | Medium (29-50) | | |
| Mitigation Measures:<br>• Develop a recruitment policy / process (to be implemented by contractors), which will source labour locally.<br>• Work together with government agencies to ensure service provision is in line with the development needs of the local area. | | | | | | | | | | | | | |

### 9.3.6 Heritage

Heritage resources are sparsely distributed on the wider landscape with highly significant (Grade 1) sites being rare. Because of the low likelihood of finding further significant heritage resources in the area of Acrux Solar PV Project One and the generally low density of sites in the wider landscape the overall impacts to heritage are expected to be of generally low significance before mitigation.

For the Acrux Solar PV Project One development area, the impacts to heritage sites are expected to be of low significance. This can further be lowered by implementing mitigation measures, include isolating sites, relocating sites (e.g. burials) and excavating or sampling any significant archaeological material found to occur. The chances of further such material being found, however, are considered to be negligible. After mitigation, the overall impact significance would therefore be low.

Considering the above, the specialist has not provided an impact assessment table in terms of cumulative impacts.

### 9.3.7 Palaeontology

The general palaeontological sensitivity of the area is Low to High (see SAHRIS Palaeomap. However, it is important to note that the quality of preservation of these different sites will most probably vary and it is therefore difficult to allocate a cumulative sensitivity to the solar developments located within a 30km radius. If all site specific mitigation measures are carried out, a conservative estimate of the cumulative impacts on fossil Heritage will vary between Zero and Very High depending on the site specific results.

The estimated cumulative impacts of the development is considered to be medium pre-mitigation and Low post mitigation and falls within the acceptable limits. It is therefore considered that the Acrux Solar PV Project One will not lead to damaging impacts on the palaeontological resources of the area.

Considering the above, the specialist has not provided an impact assessment table in terms of cumulative impacts.

## 9.4 Concluding Statement

When considering the location of the Acrux Solar PV Project One and the 30 km geographical area the project is proposed in a close proximity to intensive urban development (Bloemfontein) which also includes intensive industrial development. The area is further characterised by agricultural activities and linear disturbances such as national and regional roads and transmission and distribution overhead power lines.

Only one high cumulative impact has been identified, which is related to the visual impact, however considering the location and current disturbance within the landscape it is not foreseen that this high impact is of an unacceptable level.

What must be considered and taken into consideration as part of the cumulative assessment is that not all solar developments that are awarded Environmental Authorisation are constructed and ultimately operated which is based on various technical aspects such as grid capacity to evacuate the power into the national grid as well as obtaining preferred bidder status under the REIPPP programme or securing a private off-taker.

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

The cumulative impact associated with Acrux Solar PV Project One is therefore considered to be acceptable within the landscape.

## 9.5 Legal Requirements Complied with in Section 9 as per the Requirements of the EIA Regulations, 2014 (as amended)

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts. | Section 9 of this report provides an assessment of the cumulative impacts associated with Acrux Solar PV Project One |

# 10 DEVELOPMENT FOOTPRINT AND ALTERNATIVES ANALYSIS

This section provides and analysis of the draft development footprint proposed by the Applicant for the Acrux Solar PV Project One. Furthermore, the preferred alternatives from an environmental perspective are discussed and motivated for as part of this section.

## 10.1 Site Sensitivity and Alternatives Analysis for the Facility Layout Design

The independent specialist studies undertaken has confirmed specific ground-truthed environmental sensitivities within the development area and draft development footprint / facility layout that needs to be avoided by the placement of infrastructure and within which no disturbance is allowed to take place.

The large extent of the development area (i.e., 428 ha) assessed results in an opportunity for the avoidance of the sensitive environmental features and areas through the careful placement of the development footprint and infrastructure layout. The Applicant has considered all environmental sensitivities as part of this EIA Phase and has designed an appropriate facility layout that is considered to be acceptable. This facility layout has also considered and assessed by the independent specialists as part of the EIA Phase.

The mitigation hierarchy explored as part of the site selection process (section 2.3) was further applied as part of the design of the development footprint. The Applicant has considered all recommended buffers, and thereby designed a facility layout which avoids these no-go areas to ensure no disturbance is undertaken, including the placement of infrastructure. The facility layout proposed is therefore considered to be optimised and preferred as small changes and tweaks to the design has resulted in an optimised layout which is considered to be appropriate from an environmental perspective.

The specific environmental sensitivities that have been identified and avoided, including the recommended buffers, are described below:

- *Terrestrial, Avifauna and Wetlands*
  Water resources present within the development footprint have been identified. These include depression and seepage wetlands as well as drainage features that are non-perennial and perennial. The seepage and depression wetlands, and the associated buffers, need to be avoided by the development footprint. The wetland specialist has recommended 16 m buffers for the wetlands. A Stormwater Management Plan needs to be developed for the management of waterflow over the drainage features. Refer to Figure 10.1.

- *Heritage*
  One burial site has been identified within the development area, however outside of the development footprint of the PV facility. The burial site does however fall within the grid connection corridor. The specialist has recommended a 50 m buffer around the burial site that needs to be avoided. The power line route to be placed within the grid connection corridor will need to be micro-sited as to avoid infringement on the burial site. Refer to Figure 10.2.

Figure 10.3 provides the environmental sensitivity map overlain with the optimised and preferred development footprint proposed for Acrux Solar PV Project One.

The following is concluded regarding the alternatives assessed for Acrux Solar PV Project One:

- Considering the optimisation undertaken by the Applicant to the development footprint to ensure avoidance of sensitive environmental features it is confirmed that the optimised development footprint / facility layout is preferred from an environmental perspective. Refer to Appendix F).
- In terms of the BESS location alternatives, it is confirmed that both options, a central designated location within the development footprint where a large specified area is developed or the placement and distribution of the BESS infrastructure throughout the PV array and adjacent to the inverters, is acceptable from an environmental perspective and therefore the technically preferred option takes preference. The final location of the BESS will therefore be confirmed during the micro-siting of the facility layout.
- Considering the grid connection corridor assessed for the placement of the grid connection infrastructure the route is considered as preferred based on the fact that no significant environmental issues are associated with the corridor, and it provides the shortest and most technically feasible route for connection to the Harvard Main Transmission Substation.

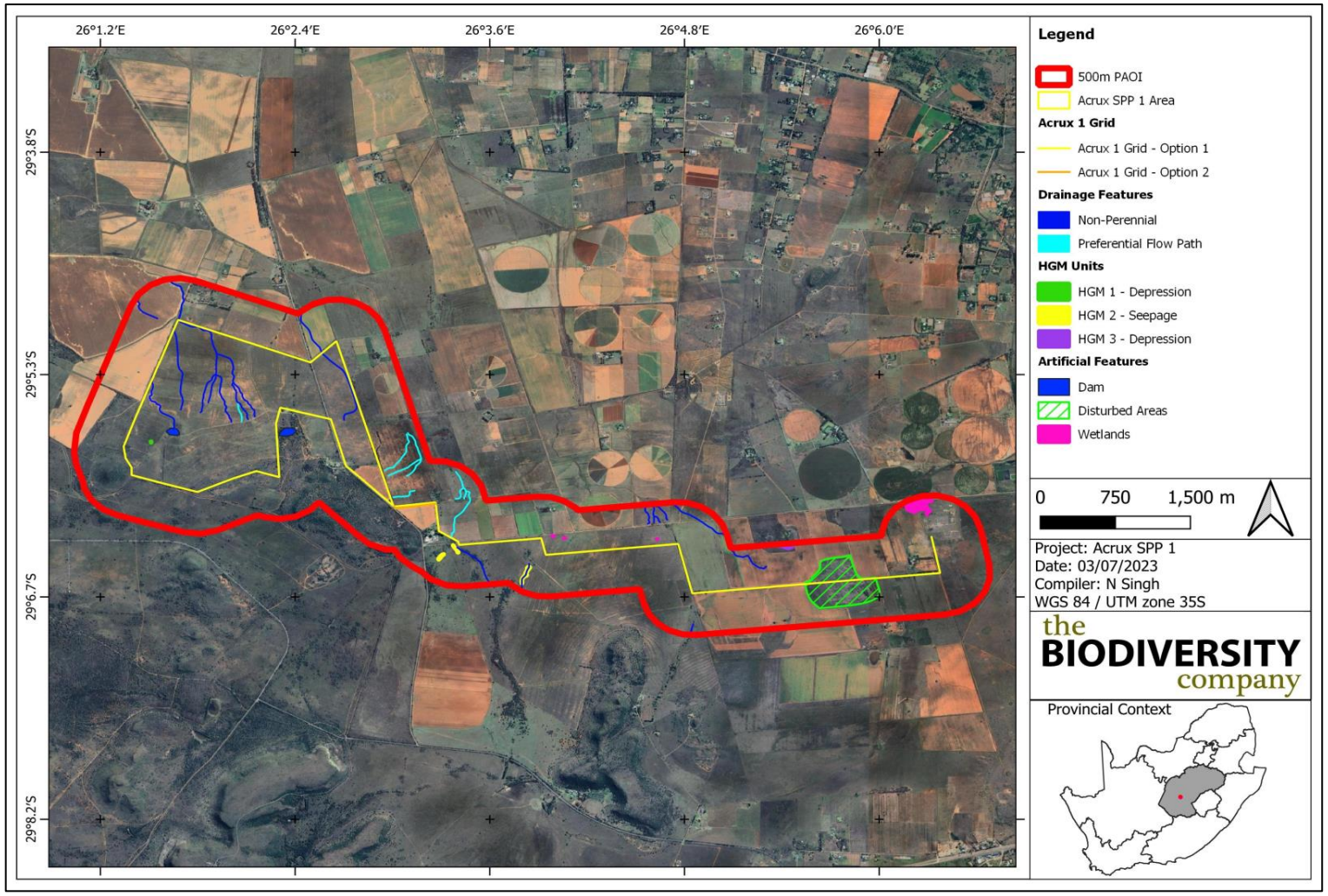


Figure 10.1: Wetland features present within the Acrux Solar PV Project One development footprint.

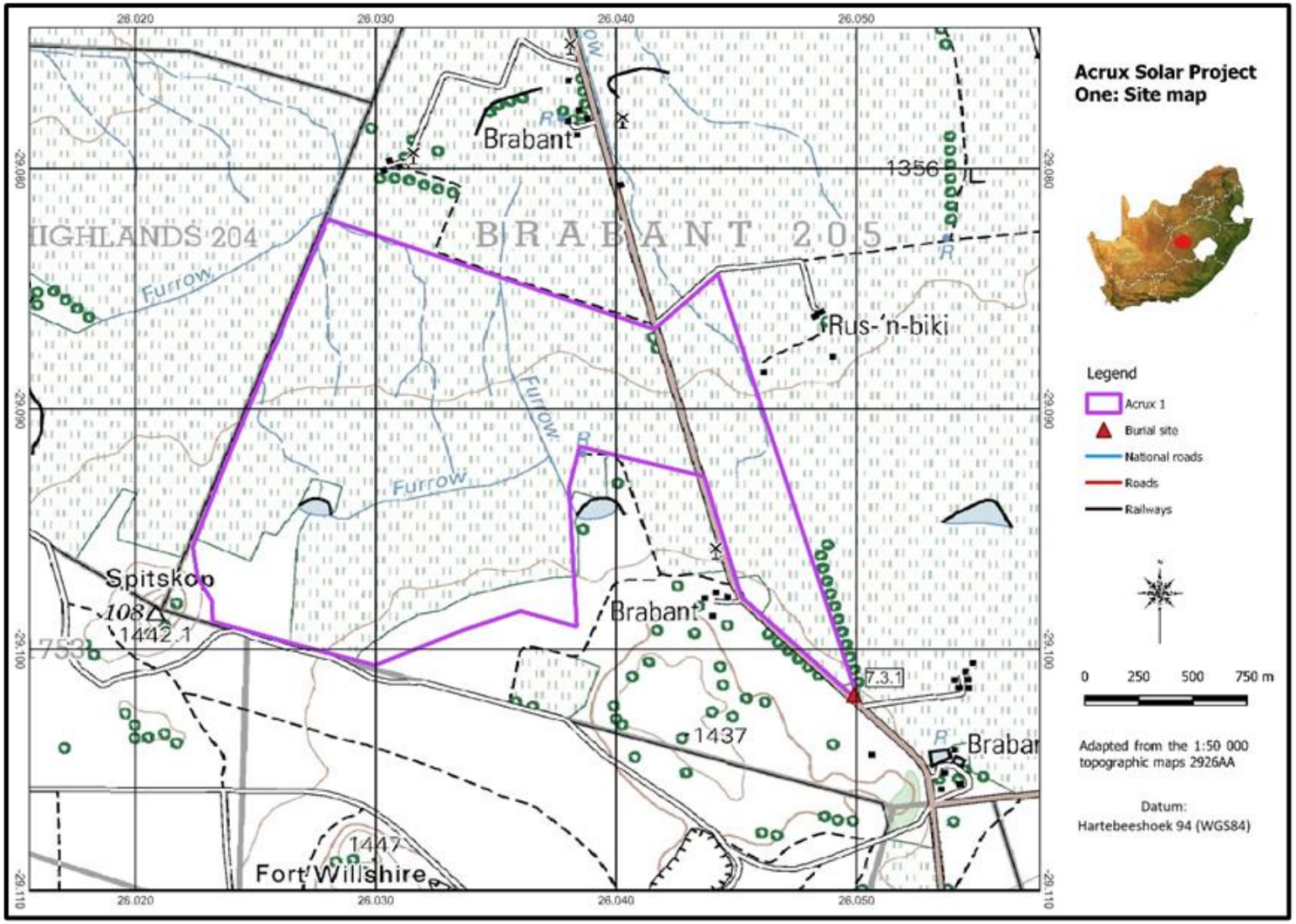


**Figure 10.2:** Burial site located within the development area and grid connection corridor of Acrux Solar PV Project One.

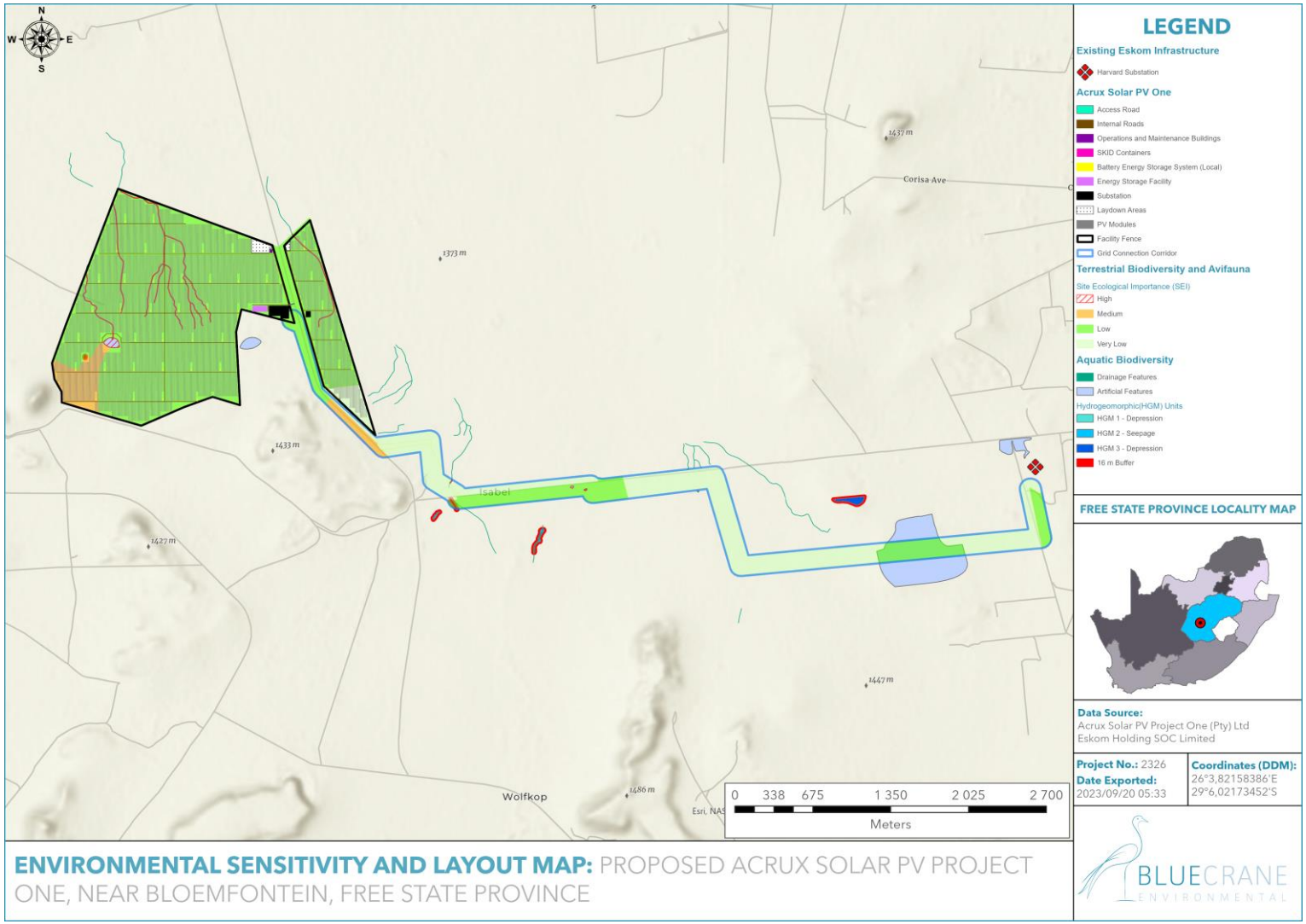


**Figure 10.3:** Optimised preferred layout map overlain by the environmental sensitivities. Also refer to Figure H3a appended.

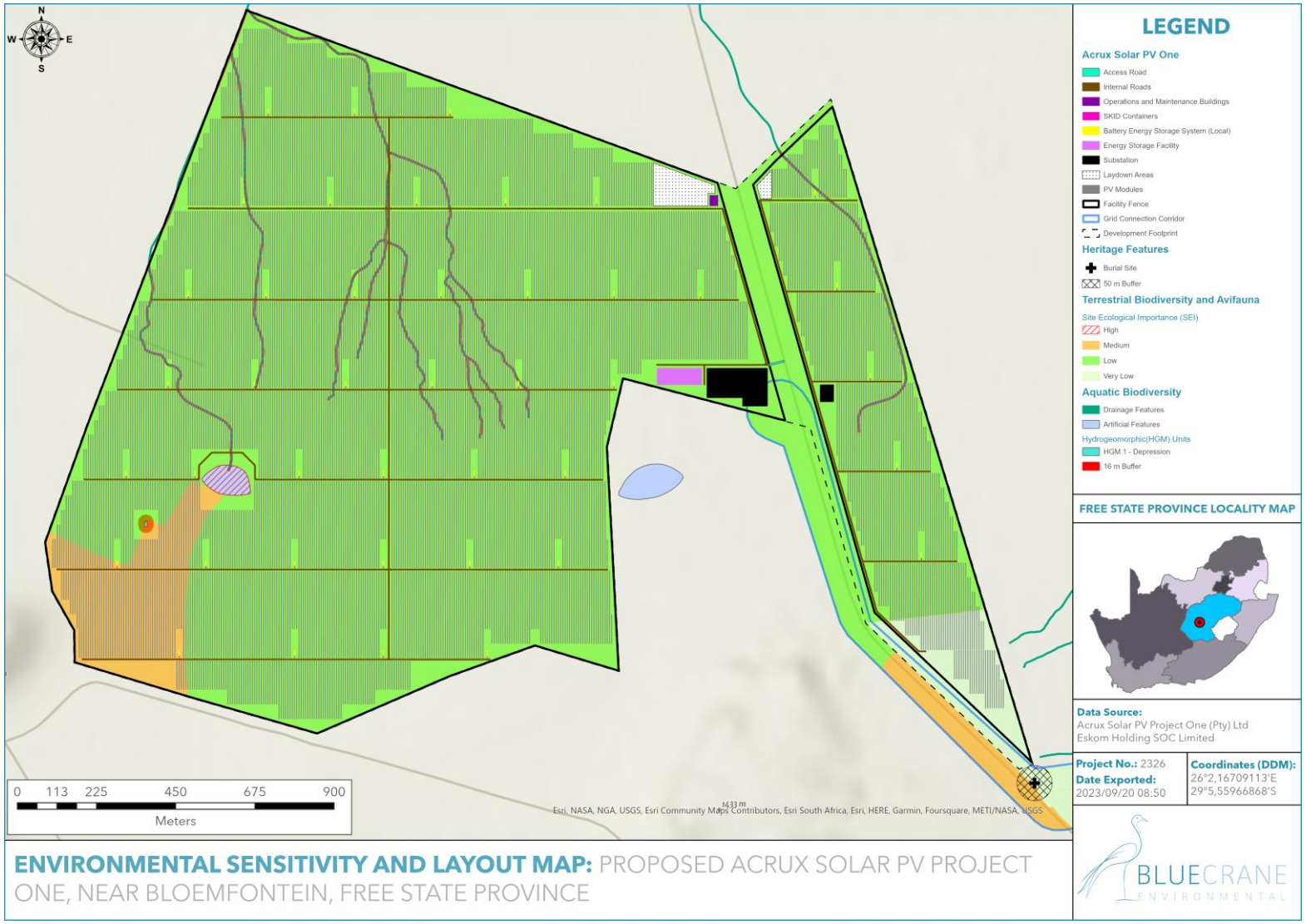


**Figure 10.4:** Optimised preferred layout map overlain by the environmental sensitivities (PV Zoom) . Also refer to Figure H3b appended.

## 10.2 Legal Requirements Complied with in Section 9 as per the Requirements of the EIA Regulations, 2014 (as amended)

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(g) a motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report. | A motivation for the preferred development footprint is included in section 10.1. |
| 3(1)(h)(x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report. | A concluding statement indicating preferred development footprint is included in section 10.1 and Figure 10.3. |
| 3(1)(n) the final proposed alternatives which respond to the impact management measures, avoidance and mitigation measures identified through assessment. | The final preferred alternatives considering the environmental sensitivities and mitigation measures are indicated in section 10.1. |

# 11 CONCLUSION

The draft EIA Report was undertaken with the main aim of assessing the impacts that may occur with the development of the proposed Acrux Solar PV Project One within the development area.

The development of a solar energy facility on a site located on Remaining extent of Portion 6 of the Farm Brabant No. 205 as well as the associated required grid connection infrastructure may potentially result in both negative and positive environmental impacts that need to be mitigated to ensure that the development is appropriate from an environmental perspective. The entire extent of a 320 ha development footprint, and a grid connection corridor have been assessed as part of this draft EIA Report.

Key potential environmental impacts have been identified for the development through inputs provided from independent specialists. The impacts and the significance of the impacts listed below is without the implementation of the required mitigation measures.

## 11.1 Summary of key impacts

The Acrux Solar PV Project One impact assessment highlights several key impacts across various aspects, including terrestrial biodiversity, wetland, avifauna, soil and agriculture, social, and heritage. Here is a summary of the key impacts and their significance:

*Overall Environmental Impact:*

- The project is expected to have medium to high environmental impact, especially during the construction phase. These impacts can be mitigated and reduced to an acceptable level through the implementation of the recommended mitigation measures.

Mitigation measures are crucial to prevent the total destruction of valuable natural resources, including indigenous vegetation and local fauna species.

*Terrestrial Biodiversity Impact (Construction Phase):*

- Destruction, loss, and fragmentation of habitats, ecosystems, and vegetation.
- Introduction of invasive alien plant species.

- Displacement of indigenous faunal communities.

These impacts can be mitigated to medium and low significance with recommended measures.

*Terrestrial Biodiversity Impact (Operation Phase):*

- Continuing spread of invasive plant species.
- Displacement and direct mortalities of faunal communities.

These Impacts can be mitigated to low significance through appropriate measures.

*Wetland Impact:*

- Moderate risk to wetlands due to construction and within the grid connection corridor.
- Seepage and depression wetlands (and recommended buffers) need to be avoided by the development footprint

Mitigation measures can reduce risks and impacts to a low level, but some impacts are still expected.

*Avifauna Impact:*

- Negative impacts on avifauna due to construction and operation activities.
- Impacts include habitat loss, noise pollution, poaching and roadkill, collision and electrocution.

Mitigation measures are recommended to reduce the significance of these impacts to acceptable level.

*Soil and Agriculture Impact:*

- The impact of Acrux Solar PV Project One on agricultural land is considered acceptable.
- Agricultural sensitivity ranges from medium to low.

Mitigation measures include restricting land clearing and implementing stormwater management.

*Social Impact:*

- The construction phase may have social impacts related to the influx of non-local workforce, noise, dust, road wear, and safety risks.

- Operation phase impacts include both positive (employment, economic development) and negative (agricultural land loss, visual impacts).
- Decommissioning impacts are similar to construction.

Most impacts can be mitigated to low significance with proper planning.

*Heritage Impact:*

- Limited heritage sites identified in the development area.
- Burial site identified within the development area, but outside of the development footprint. The burial site is located within the grid connection corridor and therefore the power line route alignment within the corridor must be micro-sited to avoid the burial site and it associate buffer.

Impacts on heritage sites are expected to be low and can be further reduced with mitigation measures.

*Palaeontological Impact:*

- The development area is considered low in palaeontological sensitivity.
- Construction phase has high pre-mitigation and low post-mitigation significance.
- No significant impacts expected during operation and decommissioning phases.

No further studies or mitigation are required.

In conclusion, the impact assessment has indicated that with careful consideration and implementation of the recommended mitigation measures, the Acrux Solar PV Project One is not expected to result in unacceptable high impacts that cannot be managed. However, careful planning and adherence to mitigation measures are essential to minimise adverse effects on the environment, biodiversity, wetlands, avifauna, agriculture, social aspects, heritage, and palaeontology. No fatal flaws have been identified.

## 11.2 Preferred Development Footprint

An iterative process has been undertaken as part of the EIA process between the Applicant, EAP and independent specialists which included the sharing of information and solutions in terms of the environmental sensitivities and challenges present within the development footprint. The process considered optimisation of the development footprint within the development area which has been fully assessed and considered as part of this draft EIA Report.

The Applicant has considered and implemented the recommendations made by the independent specialists and have adhered to and optimised the development footprint to a point where it is considered to be environmentally appropriate and acceptable for development, on the condition that all other recommended mitigation measures be implemented accordingly. This is in line with the mitigation hierarchy which has been applied as part of this EIA process.

It is therefore confirmed that the preferred development footprint (Figures 11.1 and 11.2 and Figures J1 and J2) is put forward for decision-making on the Application for Environmental Authorisation.

Furthermore, it is confirmed that the following list of infrastructure is put forward for decision-making on the Application for Environmental Authorisation:

- PV Panel Array, including mounting structures, to enable the generation of up to 200 MWac of electricity.
- Inverters and transformers.
- Battery Energy Storage System (BESS) / facilities required for the storage of generated electricity.
- Site and internal access roads (between 8 m and 12 m wide). Roads are required to access the site, as well as internally to access the various project components.
- Grid connection infrastructure including:
    - 33 kV cabling between the project components and the facility substations;
    - Two facility substations up to 132 kV (one located on either side of the road);
    - A 132 kV single/double circuit overhead power line linking the two facility substations; and
    - A collector switching station up to 132kV;
    - A 132 kV single/double circuit overhead power line linking the facility substation / Eskom switching station to the existing Harvard Transmission Substation
- Supporting infrastructure is required in the form of auxiliary buildings (including basic services such as water and electricity). These include an operations and 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.
- Temporary concrete batching plant for construction purposes.

- For health, safety and security reasons, the facility will be required to be fenced off from the surrounding farms.

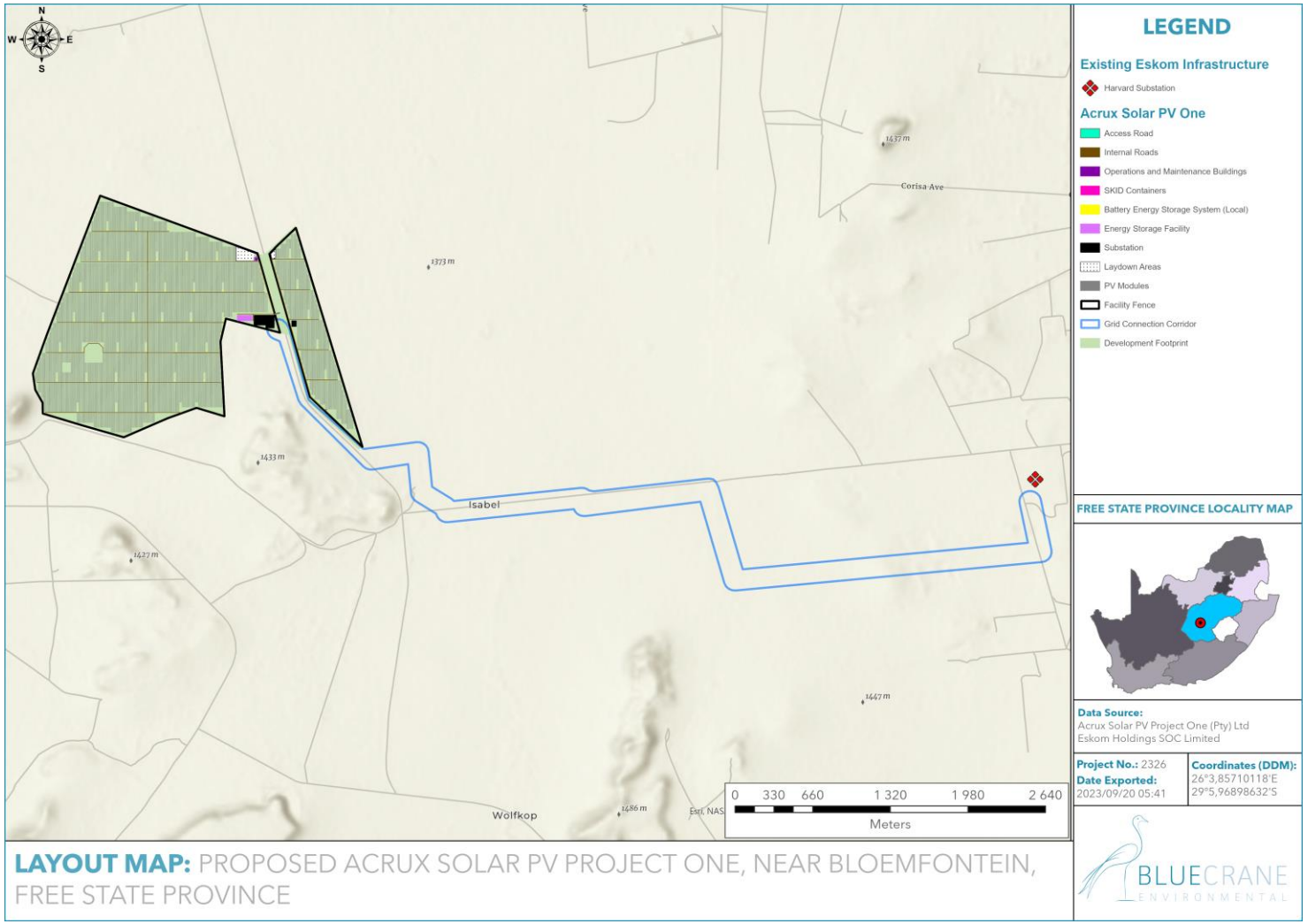


Figure 11.1: Optimised preferred development footprint / facility layout put forward for authorisation for the Acrux Solar PV Project One.

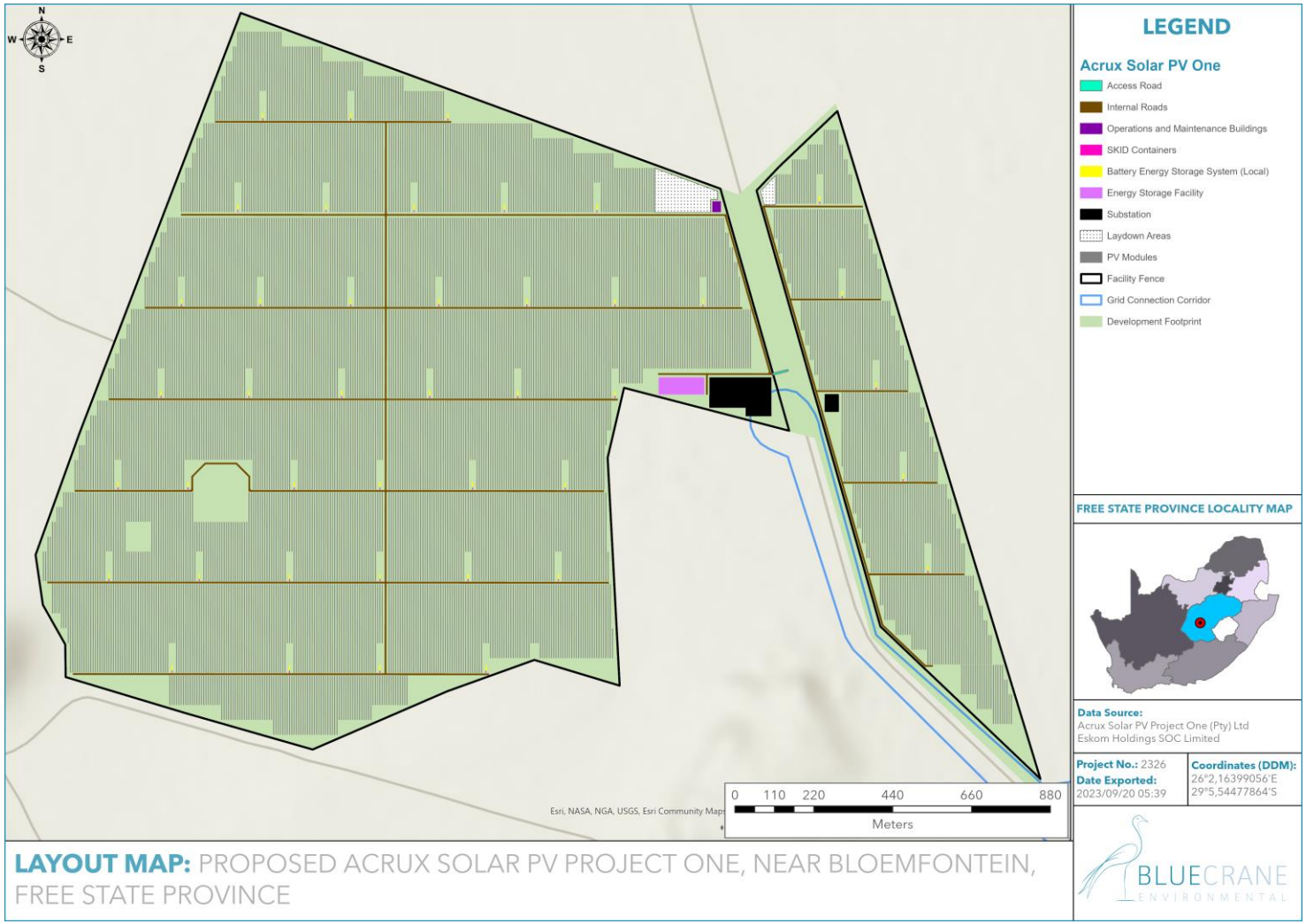


Figure 11.2: Optimised preferred development footprint / facility layout put forward for authorisation for the Acrux Solar PV Project One.

## 11.3 Conditions of the EA

The following specific conditions are recommended for inclusion as part of the Environmental Authorisation, should this be awarded by the Department of Forestry, Fisheries and the Environment:

- All mitigation measures set out in the EMPr(s) must be implemented and adhered to.
- All mitigation measures set out in the specialist studies must be implemented and adhered to.
- All relevant national environmental laws and regulations relevant to Acrux Solar PV Project One must be adhered to.
- A detailed Geotechnical Assessment must be undertaken for the development footprint as part of the micro-siting of the layout.
- Authorisation in terms of the National Water Act (Section c & i) must be obtained for the water features present within the development footprint.
- A Stormwater Management plan must be designed and implemented and must specifically consider the perennial and non-perennial drainage features present within the development footprint.
- The optimised preferred development footprint must be implemented as it avoids the environmental sensitive features present.
- A wet season walkthrough of the development footprint must be conducted by a suitably qualified ecologist prior to the commencement of the construction phase. This does not constitute a post EA study.

## 11.4 Reasoned Opinion of the EAP

In determining whether the Acrux Solar PV Project One should be authorised, a balanced assessment of its positive and negative impacts as revealed by the impact assessment must be considered. It's crucial to weigh the potential benefits of the project against its adverse effects on various aspects, including the environment, biodiversity, social factors, and heritage. It must also be considered whether the mitigation measures proposed are of such a degree that the impacts can be reduced to an acceptable level. Furthermore, it must be considered whether the Applicant has adhered to the requirements for avoidance of environmental sensitivities in the design and placement of infrastructure within the environment.

In conclusion, while the Acrux Solar PV Project One presents both positive and negative impacts, the decision to authorise the project should be based on a thorough and balanced evaluation of these factors. The authorisation should be contingent on the effective implementation of mitigation measures and a commitment to minimising adverse effects while maximising its positive contributions to clean energy and economic development.

Considering the results of the impact assessment and the optimisation of the development footprint of the applicant, as well as the opportunities available to minimise the impacts through the implementation of mitigation measures, it is the reasoned opinion of the EAP that Acrux Solar PV Project One be awarded Environmental Authorisation , subject to the implementation of the recommended mitigation measures included in this draft EIA Report and the Environmental Management Programme (Appendix G).

Blue Crane Environmental therefore confirms the suitability of Acrux Solar PV Project One within the assessed development area.

## 11.5 Legal Requirements Complied with in Section 9 as per the Requirements of the EIA Regulations, 2014 (as amended)

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

| Requirement | Relevant Section |
|---|---|
| 3(1)(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment. | A summary of the key impacts, including positive and negative impact, associated with Acrux Solar PV Project One is included in section 11.1. |
| 3(1)(l) an environmental impact statement which contains (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping | The preferred development footprint map which has been optimised to consider the environmental sensitivities and associated buffers is included in section 11.2. |

| | |
|---|---|
| report indicating any areas that should be avoided, including buffers. | |
| 3(1)(l) an environmental impact statement which contains (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives. | A summary of the key impacts, including positive and negative impact, associated with Acrux Solar PV Project One is included in section 11.1. |
| 3(1)(o) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation. | Conditions to the Acrux Solar PV Project Environmental Authorisation is included in section 11.3. |
| 3(1)(q) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation. | The reasoned opinion of the EAP regarding the approval or refusal of the Acrux Solar PV Project One is included in section 11.4. |
| 3(1)(r) where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised. | The period for which the environmental authorisation is required is included in section 11.4.<br><br>It is however not possible to indicate the date on which the activity will be concluded and the date on which the post construction monitoring requirements finalised as the development iss intended to be bid as part of the REIPPP programme. |

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