



SCIENTIFIC TERRESTRIAL SERVICES

## BIODIVERSITY SCOPING REPORT

**AS PART OF THE ENVIRONMENTAL  
AUTHORISATION PROCESS FOR THE  
PROPOSED TOURNÉE 2 SOLAR PARK  
NEAR THUTHUKANI, MPUMALANGA  
PROVINCE.**

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## GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et al.* (2011), Hui and Richardson (2017) and Wilson *et al.* (2017), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the associated Alien and Invasive Plant (AIP) Species Regulations, 2020].

<b>Alien species</b> (syn. exotic species; non-native species)	A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.
<b>Biological diversity or Biodiversity</b> (as per the definition in NEMBA)	The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
<b>Biome - as per Mucina and Rutherford (2006); after Low and Rebelo (1998).</b>	A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate and major large-scale disturbance factors (such as fires).
<b>Bioregion (as per the definition in NEMBA)</b>	A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act.
<b>Critical Biodiversity Area (CBA)</b>	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges.
<b>Corridor</b>	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
<b>Disturbance</b>	A temporal change, either regular or irregular (uncertain), in the environmental conditions that can trigger population fluctuations and secondary succession. Disturbance is an important driver of biological invasions.
<b>Ecoregion</b>	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".
<b>Endangered</b>	Organisms in danger of extinction if causal factors continue to operate.
<b>Endemic species</b>	Species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional or even within a particular mountain range.
<b>Ecological Support Area (ESA)</b>	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
<b>Ground-Truth</b>	To check the accuracy of (remotely sensed data) by means of in-situ observations.
<b>Habitat</b> (as per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
<b>Important Bird and Biodiversity Area (IBA)</b>	The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that: are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types or sites that have significant populations.
<b>Indigenous vegetation</b> (as per the definition in NEMA)	Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
<b>Integrity (ecological)</b>	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
<b>Invasive species</b>	Alien species that sustain self-replacing populations over several life cycles, produce reproductive offspring, often in very large numbers at considerable distances from the parent and/or site of introduction, and have the potential to spread over long distances.
<b>Listed alien species</b>	All alien species that are regulated in South Africa under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), Alien and Invasive Species Regulations, 2020.
<b>Least Threatened</b>	Least threatened ecosystems are still largely intact.
<b>Native species</b> (syn. indigenous species)	Species that are found within their natural range where they have evolved without human intervention (intentional or accidental). Also includes species that have



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	expanded their range as a result of human modification of the environment that does not directly impact dispersal (e.g. species are still native if they increase their range as a result of watered gardens, but are alien if they increase their range as a result of spread along human-created corridors linking previously separate biogeographic regions).
<b>RDL (Red Data listed) species</b>	According to the Red List of South African plants ( <a href="http://redlist.sanbi.org/">http://redlist.sanbi.org/</a> ) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), critically endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.
<b>Species of Conservation Concern (SCC)</b>	The term SCC in the context of this report refers to all RDL (Red Data) and IUCN (International Union for the Conservation of Nature) listed threatened species as well as protected species of relevance to the project.





## LIST OF ACRONYMS

<b>BESS</b>	Battery Energy Storage System
<b>BGIS</b>	Biodiversity Geographic Information Systems
<b>CARA</b>	Conservation of Agricultural Resource Act
<b>CBA</b>	Critical Biodiversity Area
<b>CR</b>	Critically Endangered
<b>DFFE</b>	Department of Forestry, Fisheries and the Environment
<b>E-GIS</b>	Environmental Geographical Information Systems
<b>EA</b>	Environmental Authorisation
<b>EIA</b>	Environmental Impact Assessment
<b>EN</b>	Endangered
<b>ESA</b>	Ecological Support Area
<b>ESMS</b>	Environmental and Social Management System
<b>GIS</b>	Geographic Information System
<b>GN</b>	Government Notice
<b>GNs</b>	Guidance Notes
<b>Ha</b>	Hectares
<b>IBA</b>	Important Bird Area
<b>IEM</b>	Integrated Environmental Management
<b>IFC</b>	International Finance Corporation
<b>IPP</b>	Independent Power Producer
<b>IUCN</b>	International Union for the Conservation of Nature
<b>km</b>	Kilometres
<b>m</b>	Metres
<b>MAP</b>	Mean Annual Precipitation
<b>MAPE</b>	Mean Annual Potential for Evaporation
<b>MASMS</b>	Mean Annual Soil Moisture Stress
<b>MAT</b>	Mean Annual Temperature
<b>MBCP</b>	Mpumalanga Biodiversity Conservation Plan
<b>MFD</b>	Mean Frost Days
<b>MNCA</b>	Mpumalanga Nature Conservation Ordinance
<b>MRA</b>	Mining Right Area
<b>MW</b>	Mega watt
<b>MWh</b>	Mega Watt Hours
<b>NBA</b>	National Biodiversity Assessment
<b>NEMA</b>	National Environmental Management Act (Act No. 107 of 1998)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
<b>NPAES</b>	National Protected Areas Expansion Strategy
<b>NT</b>	Near Threatened
<b>O&amp;M</b>	Operations and Maintenance
<b>P</b>	Protected
<b>PV</b>	Photovoltaic
<b>PVSEF</b>	Photovoltaic Solar Energy Facilities
<b>QDS</b>	Quarter Degree Square (1:50,000 topographical mapping references)
<b>RDL</b>	Red Data List
<b>SABAP 2</b>	Southern African Bird Atlas 2
<b>SACAD</b>	South Africa Conservation Areas Database
<b>SANBI</b>	South African National Biodiversity Institute
<b>SANParks</b>	South African National Parks



<b>SAPAD</b>	South Africa Protected Area Database
<b>SCC</b>	Species of Conservation Concern
<b>STS</b>	Scientific Terrestrial Services (Pty) Ltd
<b>SWSA</b>	Strategic Water Source Area
<b>TOPS</b>	Threatened Or Protected Species
<b>VEGMAP</b>	National Vegetation Map Project
<b>VU</b>	Vulnerable
<b>WSAs</b>	Water Source Areas



# 1 INTRODUCTION

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed by Tournée 2 Solar Parks (Pty) Ltd to conduct a biodiversity scoping assessment as part of the Environmental Impact Assessment (EIA) and Environmental Authorisation (EA) process for the proposed Tournée 2 Solar Photovoltaic (PV) Park near Thuthukani, Mpumalanga Province.

## 1.1 Background and Project Description

Tournée 2 Solar PV Park will consist of 150 megawatt (MW) PV solar energy facilities (PVSEF) within a total area of approximately 505.2 hectares (ha), of which 297 ha is considered developable area. The final developable areas will be determined in the EIA phase once the layout has been finalised. The total footprint of the Independent Power Producer (IPP) site substation and battery energy storage system (BESS) will be up to 5 ha in extent (3 ha for the BESS and 2.5 ha for the back to back substation including IPP side and Eskom side). The substation will consist of a high voltage substation yard to allow for multiple (up to) 132 kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc. The associated BESS storage capacity will be up to 150 MW/600 megawatt-hour (MWh) with up to four hours of storage.

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate or Lithium Nickel Manganese Cobalt oxides will be considered as the preferred battery technology. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers.

The Operations and Maintenance (O&M) building footprint is expected to be 1 500m<sup>2</sup> (including stores and workshop). Internal roads of the Tournée 2 Solar PV Park will be 4m to 5m in width and approximately 8 km in length. During the construction phase, the construction camp and laydown area will include a typical construction camp area of 5000 m<sup>2</sup>, a typical laydown area of 20000 m<sup>2</sup> and septic tanks and portable toilets. The proponent provided preliminary development and exclusion areas for the Tournée 2 Solar PV Park (Figure 3) however, the layout will be finalised based on the results of all specialists and presented in the EIA report.

Tournée 2 Solar PV Park is on the remaining portion of Portion 3 of the farm DWARS-IN-DE-WEG 350 (extent in ha 344.1), and Portion 6 of the farm DWARS-IN-DE-WEG 350 (extent in ha 161.1). The Tournée 2 Solar PV Park is surrounded by various major roadways including the R38, which is located approximately 5 km south of the Tournée 2 Solar PV Park and the R38 located 1.5 km West of the Tournée 2 Solar PV Park. The closest town, Thuthukani is





located within the Lekwa Local Municipality and Gert Sibande District Municipality, approximately 10.5 km west of the proposed Tournée 2 Solar PV Park area. The Tournée 2 Solar PV Park is located adjacent to the Tutuka Power Station Ashing facility (Figure 1).

The purpose of this report was to investigate and provide detail on a desktop level and verify national and provincial databases available associated with the Tournée 2 Solar PV Park. This desktop assessment was used in the preparation of the field assessment to verify and to assist in the report findings that will be discussed in detail in the EIA report. This report provides a brief description of field assessment findings and the plan of study for the EIA report and methodologies used.



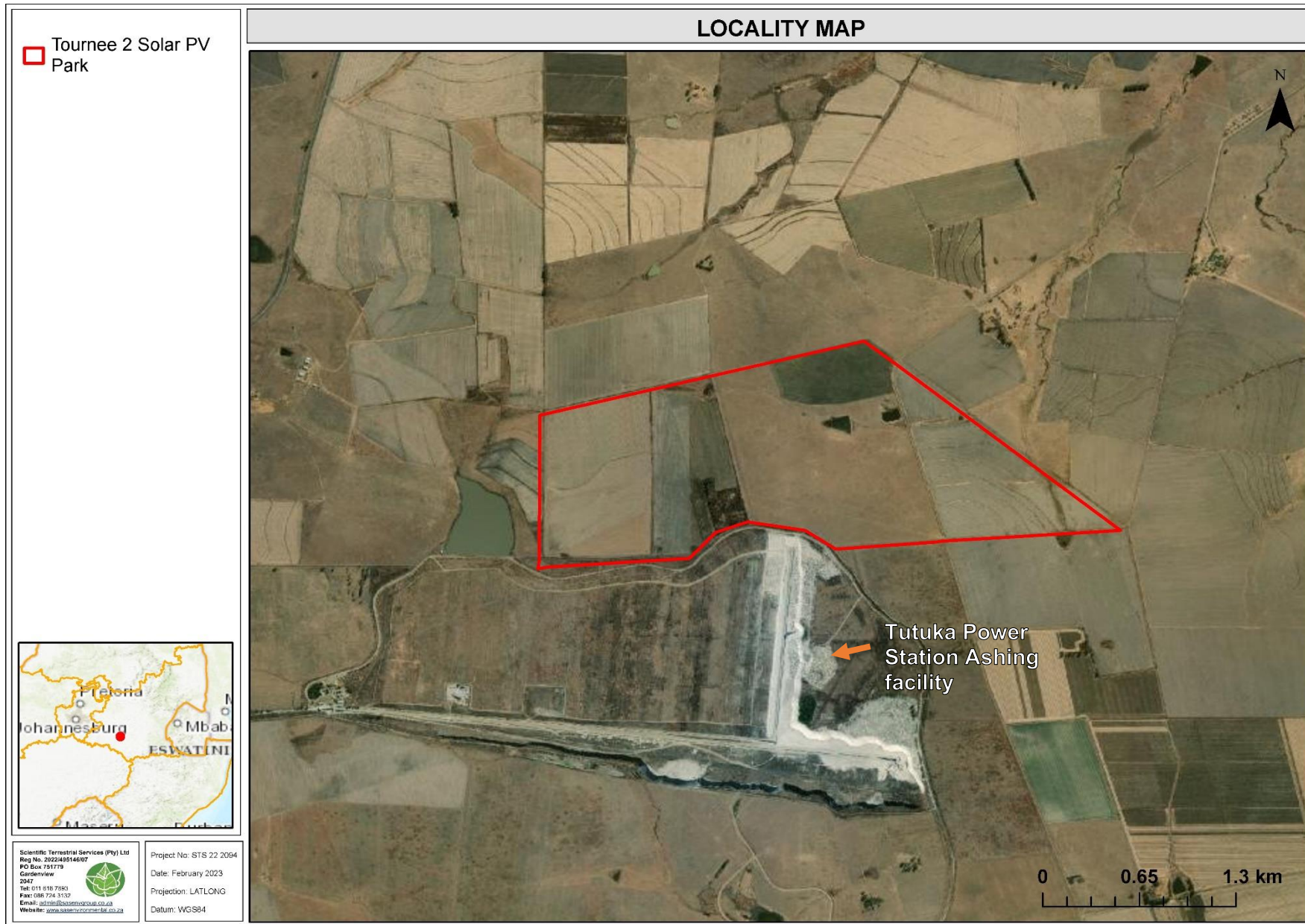


Figure 1: Digital satellite image depicting the Tournée 2 Solar PV Park in relation to the surrounding area.





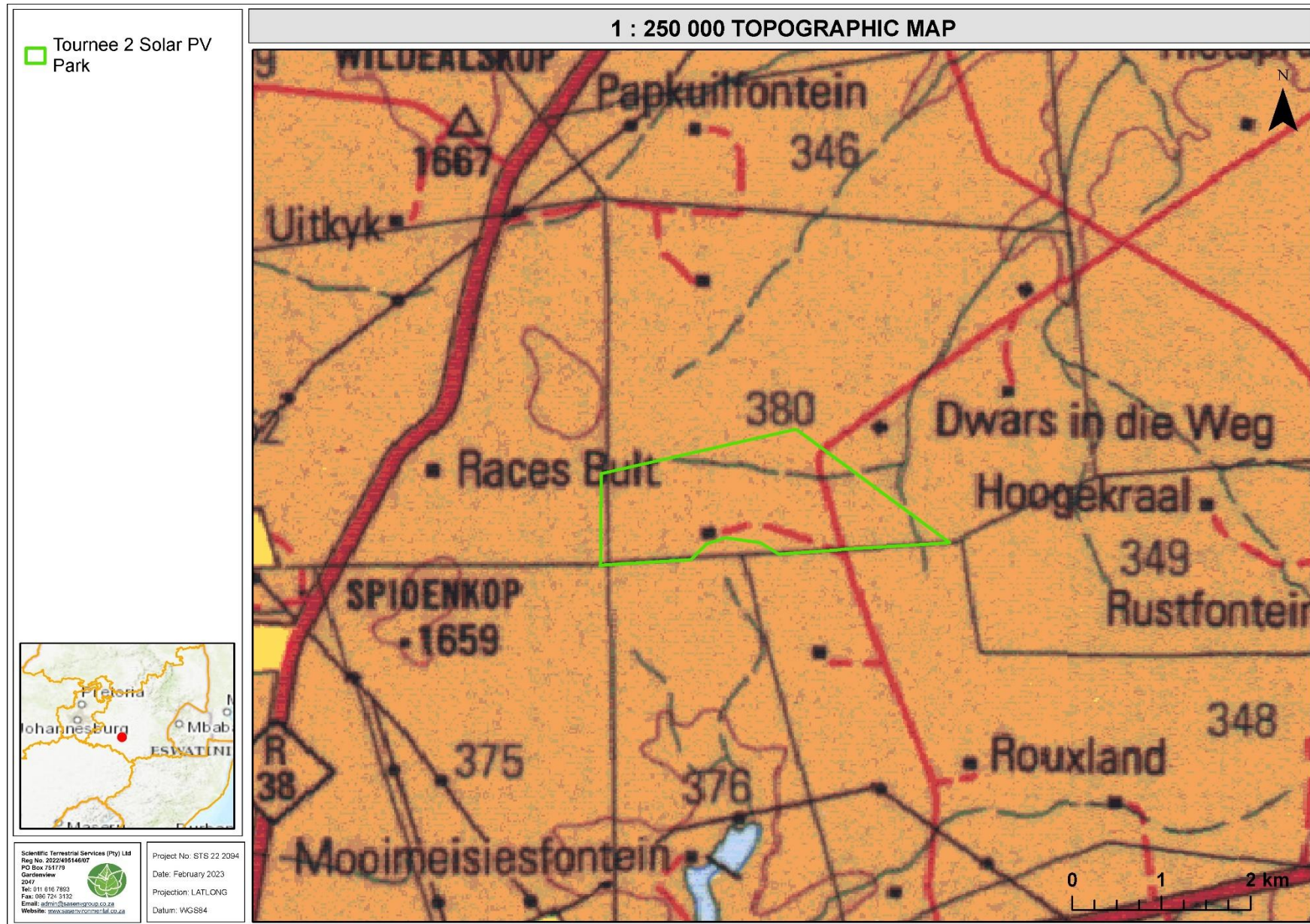


Figure 2: The Tournée 2 Solar PV Park depicted on a 1:250 000 topographical map in relation to the surrounding area.





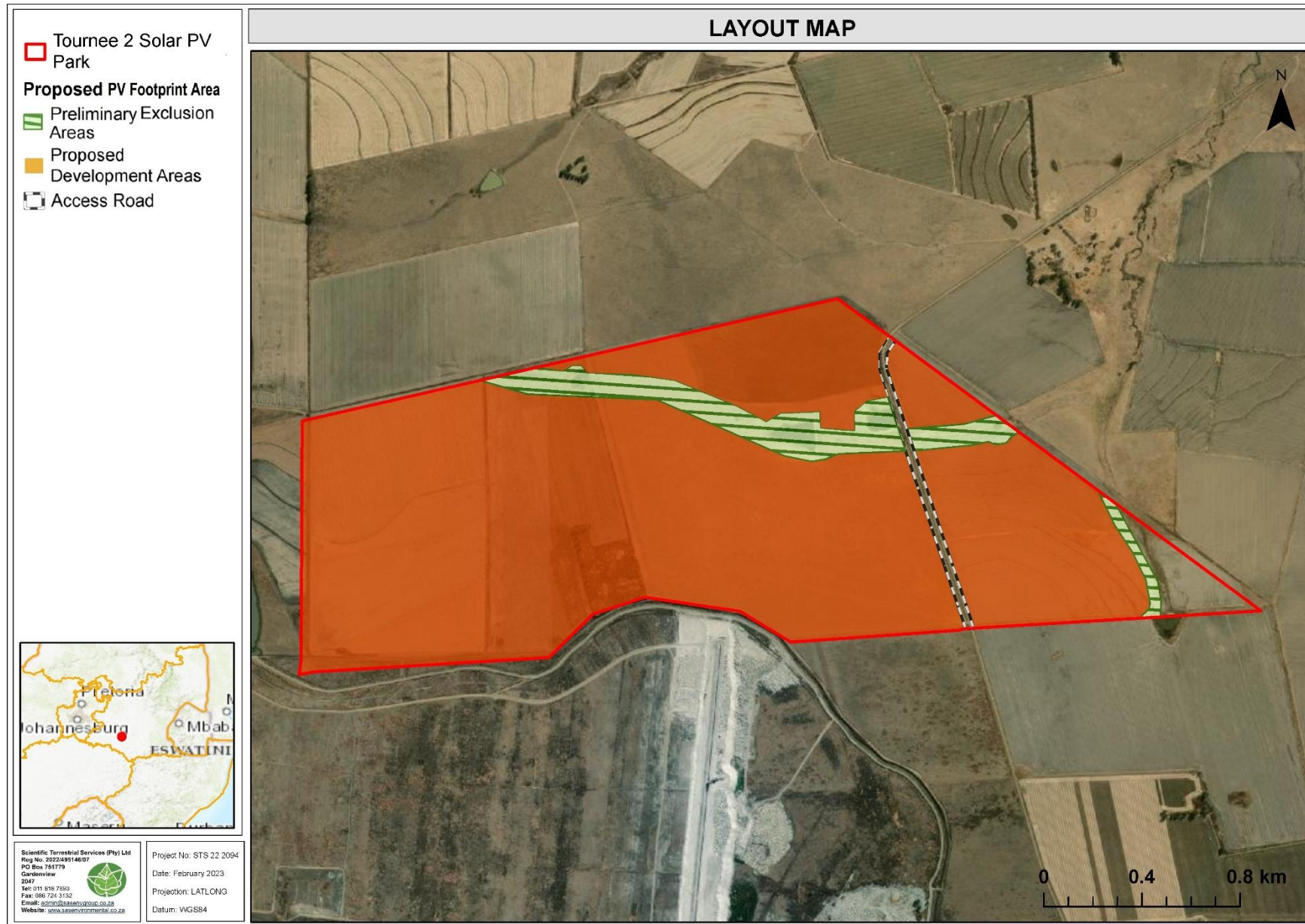


Figure 3: The proposed layout of the Tournée 2 Solar PV Park, overlaid on digital satellite imagery.



## 1.2 Scope of Work

Specific outcomes in terms of the Scoping Phase report are as follows:

- To compile a desktop assessment with all relevant information as presented by the South African National Biodiversity Institute's (SANBI's) Biodiversity Geographic Information Systems (BGIS) website (<http://bgis.sanbi.org>) and the Environmental Geographical Information Systems (E-GIS) website (<https://egis.environment.gov.za/>). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the Tournée 2 Solar PV Park;
- Compile a report presenting the results and findings of the scoping assessment, as well as identify potential preliminary impacts associated with the proposed infrastructure development within the Tournée 2 Solar PV Park;
- Present the plan of study for the EIA phase of the project, including the methods of assessment to be use; and
- A site visit was conducted between the 6<sup>th</sup> and 9<sup>th</sup> of February 2023 to comply with the National Environmental Management Act (NEMA; Act 107 of 1998), associated EIA Regulations (Government Notice (GN) number R982, GN R983, R984 and R985 of 2014). The findings of the site assessment, as well as potential cumulative impacts for consideration and a plan of study for the impact assessment phase is provided within this assessment.

## 1.3 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The biodiversity desktop assessment was confined to the Tournée 2 Solar PV Park and did not include the neighbouring and adjacent properties, although the sensitivity of surrounding areas is included on the respective maps;
- The scope of work as undertaken by STS excludes any avifaunal assessments of the Tournée 2 Solar PV Park;
- It is acknowledged that the data presented within this report may change in due course as more background studies are undertaken and further information is obtained for the Tournée 2 Solar PV Park. However, the data presented within this report is considered sufficient, with suitable detail, to fulfil the needs of the scoping phase and initial decision-making processes; and
- This scoping phase study was undertaken primarily as a desktop assessment and as such, the information gathered must be considered with caution, as inaccuracies and



data-capturing errors are often present within the online databases. Since this information forms part of the scoping phase, this desktop assessment with supporting preliminary field assessment results should provide adequate information for informed decision-making and to inform the Plan of Study for the EIA phase.

## 1.4 Legislative Requirements

The following legislative requirements were considered during the assessment:

- The Constitution of the Republic of South Africa, 1996<sup>1</sup>;
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA);
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
  - Government Notice (GN) number 2747: The Revised National List of Ecosystems that are Threatened and in need of Protection, published in Gazette No. 47526, dated 18 November 2022, as it relates to the NEMBA;
  - GN number R.1020: Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020 as it relates to the NEMBA;
  - Government Notice number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 September 2020;
  - GN 3009: Regulations Pertaining to Threatened or Protected Terrestrial Species and Freshwater Species in Government Gazette 47984 dated 3 February 2023, as it relates to the NEMBA; and
  - GN 3012: List of Terrestrial and Freshwater Species that are Threatened or Protected, Restricted Activities that are Prohibited, and Restricted Activities that are Exempted, in Government Gazette 47984 dated 3 February 2023, as it relates to the NEMBA.
- The National Forest Act, 1998 (Act No. 84 of 1998, amended) (NFA);
  - GN 1935: List of Protected Tree Species as published in the Government Gazette 46094 dated 25 March 2022, as it relates to the NFA;
- The National Environmental Management: Protected Areas Act, 2003 (Act. No. 57 of 2003) (NEMPAA); and
- Government Gazette 45421 dated 10 May 2019 as it relates to the Department of Forestry, Fisheries, and the Environment's (DFFE) national environmental screening

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<sup>1</sup> Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996'. It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it nor the acts amending it are allocated act numbers.





report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations:

- For the Terrestrial Biodiversity Theme: GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020; and
  - For Animal and Plant Species Themes: GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species as published in Government Gazette 43855 dated 30 October 2020; and
- The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA).

## 2 ASSESSMENT APPROACH

The below section briefly outlines the approach taken for the scoping report.

### 2.1 Desktop Assessment

Maps and digital satellite images were generated prior to the field assessment to determine broad habitats, vegetation types and potentially sensitive sites. The biodiversity desktop assessment is confined to the Tournée 2 Solar PV Park and does not include the neighbouring and adjacent properties, although the sensitivity of surrounding areas is included on the respective maps. Relevant databases and documentation that were considered during the assessment of the Tournée 2 Solar PV Park include:

- National Protected Areas Expansion Strategy (NPAES) – 2018 database;
- The South African Conservation Areas Database, Quarter 3 (SACAD, 2022);
- The South African Protected Areas Database, Quarter 3 (SAPAD, 2022);
- The Mpumalanga Biodiversity Sector Plan (MBSP) – 2019 terrestrial data set;
- The National Vegetation Map Project (VEGMAP), with the below vector dataset used for information on Biomes, Bioregions and Vegetation Type(s):
  - 2018 Final Vegetation Map of South Africa, Lesotho, and Swaziland (SANBI, 2018a)
- The 2022 Red List of Ecosystems (RLE) for the terrestrial realm for South Africa (SANBI 2022a and 2022b);
- From the National Biodiversity Assessment (NBA, 2018) Terrestrial Assessment project (Skowno et al., 2019):
  - 2018 Terrestrial ecosystem threat status and protection level - remaining extent (SANBI, 2018b); and



- 2018 Terrestrial ecosystem threat status and protection level layer (SANBI, 2018c);
- The Important Bird and Biodiversity Areas (IBA) Programme and vector dataset (BirdLife South Africa, 2015; Marnewick et al., 2015a and 2015b), in conjunction with the South African Bird Atlas Project 2 (SABAP 2);
- From the 2017 Strategic Water Source Areas (SWSA) project:
  - 2017 SWSA **Surface water** (Water Research Commission, 2017);
- The International Union for Conservation of Nature (IUCN); and
- The National Web-Based Environmental Screening Tool (accessed 2023).

The field assessments took place during the summer months to “ground-truth” the results of the desktop assessment. The preliminary findings of the site assessment, as well as potential cumulative impacts for consideration and a plan of study for the impact assessment phase is provided within section 4 to 6 of this report.

### **3 RESULTS OF THE DESKTOP ANALYSIS**

#### ***3.1 Conservation Characteristics of the Tournée 2 Solar PV Park based on National and Provincial Datasets***

The following section contains data accessed as part of the desktop assessment and are presented as a “dashboard” report below (Table 1). The dashboard report aims to present concise summaries of the data on as few pages as possible to allow for improved assimilation of results by the reader to take place. Where required, further discussion and interpretation are provided.



**Table 1: Summary of the biodiversity characteristics associated with the Tournée 2 Solar PV Park [Quarter Degree Squares (QDS) 2629CD].**

DETAILS OF THE TOURNÉE 2 SOLAR PV PARK IN TERMS OF THE 2018 FINAL VEGMAP OF SOUTH AFRICA, LESOTHO, AND SWAZILAND (SANBI, 2006-2018) ORIGINAL EXTENT OF VEGETATION TYPES		DESCRIPTION OF THE SOWETO HIGHVELD GRASSLAND WITHIN THE TOURNÉE 2 SOLAR PV PARK (MUCINA & RUTHERFORD, 2006)														
<b>Biome</b>	The Tournée 2 Solar PV Park is situated within the <b>Grassland Biome</b> .	<b>Distribution</b>	Mpumalanga, Gauteng (and to a very small extent also in neighbouring Free State and North-West) Provinces: In a broad band roughly delimited by the N17 road between Ermelo and Johannesburg in the north, Perdekop in the southeast and the Vaal River (border with the Free State) in the south. It extends further westwards along the southern edge of the Johannesburg Dome (including part of Soweto) as far as the vicinity of Randfontein. In southern Gauteng it includes the surrounds of Vanderbijlpark and Vereeniging as well as Sasolburg in the northern Free State.													
<b>Bioregion</b>	The Tournée 2 Solar PV Park is situated within the <b>Mesic Highveld Grassland Bioregion</b> .															
<b>Vegetation Type</b>	The Tournée 2 Solar PV Park occurs within the <b>Soweto Highveld Grassland (Gm8)</b> vegetation type.															
CONSERVATION DETAILS PERTAINING TO THE TOURNÉE 2 SOLAR PV PARK (VARIOUS DATABASES)		<b>Climate</b>	Summer-rainfall region (MAP 662 mm). Cool-temperate climate with thermic continentality (high extremes between maximum summer and minimum winter temperatures, frequent occurrence of frost, large thermic diurnal differences, especially in autumn and spring).													
<b>National Biodiversity Assessment (2018) Figure 4</b>	The Tournée 2 Solar PV Park is largely transformed, and vast sections thereof are identified as being within the remaining extent of the <b>Soweto Highveld Grassland</b> . This vegetation type is considered Vulnerable (VU) and Not Protected.  Ecosystem types are categorised <sup>2</sup> as “not protected”, “poorly protected”, “moderately protected” and “well protected” based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA and compared with the biodiversity target for that ecosystem.		<table border="1"> <thead> <tr> <th>MAP (mm)</th> <th>MAT (°C)</th> <th>MFD (days)</th> <th>MAPE (mm)</th> <th>MASMS (%)</th> </tr> </thead> <tbody> <tr> <td>662</td> <td>14.8</td> <td>41</td> <td>2060</td> <td>75</td> </tr> </tbody> </table>	MAP (mm)	MAT (°C)	MFD (days)	MAPE (mm)	MASMS (%)	662	14.8	41	2060	75			
		MAP (mm)	MAT (°C)	MFD (days)	MAPE (mm)	MASMS (%)										
		662	14.8	41	2060	75										
<b>Altitude (m)</b>	1 420–1 760 m															
		<b>Conservation</b>	<b>Endangered (EN)</b> . Target 24%. Only a handful of patches statutorily conserved (Waldrift, Krugersdorp, Leeuwkuil, Suikerbosrand, Rolfe’s Pan Nature Reserves) or privately conserved (Johanna Jacobs, Tweefontein, Gert Jacobs, Nikolaas and Avalon Nature Reserves, Heidelberg Natural Heritage Site). Almost half of the area already transformed by cultivation, urban sprawl, mining and													

<sup>2</sup> The ecosystem protection level status is assigned using the following criteria:

- i. If an ecosystem type has more than 100% of its biodiversity target protected in a formal protected area either A or B, it is classified as Well Protected;
- ii. When less than 100% of the biodiversity target is met in formal A or B protected areas it is classified as Moderately Protected;
- iii. If less than 50% of the biodiversity target is met, it is classified as Poorly Protected; and
- iv. If less than 5% it is Hardly Protected.



<p><b>National Red Listed Ecosystems (2022) Figure 5</b></p>	<p>Based on the National Red Listed Ecosystems Database (2022), vast sections of the Tournée 2 Solar PV Park are identified as being within the remaining extent of the <b>VU Soweto Highveld Grassland</b>.</p> <p>The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. The revised list (known as the RLE 2022) is based on assessments that followed the IUCN RLE Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa (Mucina and Rutherford 2006; with updates described in Dayaram et al., 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types).</p> <p>Following a series of consultations with conservation authorities and the public in 2020/21, the revised list of terrestrial ecosystems that are threatened and in need of protection was approved by the Minister for implementation in August 2022. The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022.</p>		<p>building of road infrastructure. Some areas have been flooded by dams (Grootdraai, Leeukuil, Trichardtsfontein, Vaal, Willem Brummer). Erosion is generally very low (93%).</p>
<p><b>Geology &amp; Soils</b></p>	<p>Shale, sandstone or mudstone of the Madzaringwe Formation (Karoo Supergroup) or the intrusive Karoo Suite dolerites which feature prominently in the area. In the south, the Volksrust Formation (Karoo Supergroup) is found and in the west, the rocks of the older Transvaal, Ventersdorp and Witwatersrand Supergroups are most significant. Soils are deep, reddish on flat plains and are typically Ea, Ba and Bb land types.</p>		
<p><b>Vegetation &amp; landscape features (Dominant Floral Taxa in Appendix E)</b></p>	<p>Gently to moderately undulating landscape on the Highveld plateau supporting short to medium-high, dense, tufted grassland dominated almost entirely by <i>Themeda triandra</i> and accompanied by a variety of other grasses such as <i>Elionurus muticus</i>, <i>Eragrostis racemosa</i>, <i>Heteropogon contortus</i> and <i>Tristachya leucothrix</i>. In places not disturbed, only scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops interrupt the continuous grassland cover.</p>		
<p><b>STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)</b></p>		<p><b>MPUMALANGA BIOBASE (2002)</b></p>	
<p>Surface water Strategic Water Source Areas (SWSAs) are defined as areas of land that supply a disproportionate (i.e., relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.</p>	<p>The demarcation of floristic regions is based on groups of taxa with more or less similar geographical distributions. Floristic regions can be classified hierarchically to reflect similarities and differences between regions. A phytochorion is a floristic (phytogeographical) region of any rank. At a particular scale, a phytochorion may also be called a 'centre of endemism' when distinguished by a high concentration of endemic plant taxa (van Wyk &amp; Smith 2001). Phytochoria usually incorporates different vegetation types, so it may include forest, grassland, and bushveld, but these will have common recurring floristic elements.</p>		
<p><b>Name &amp; Criteria</b></p>	<p>The Tournée 2 Solar PV Park is not within 10 km of a SWSA.</p>	<p><b>Phyto Regions and centres of Endemism</b></p>	<p>The Tournée 2 Solar PV Park is not located within any Phyto regions and / or centres of endemism.</p>



<b>MPUMALANGA BIODIVERSITY SECTOR PLAN (2019) TERRESTRIAL DATABASE – FIGURE 7</b>	
<b>Other Natural Areas</b>	<p>A moderate extent of the Tournée 2 Solar PV Park is represented by <b>Other Natural Areas</b> (approximately 179.4 ha). These areas are generally located within sections Tournée 2 Solar PV Park that area not cultivated. These are Natural areas which are not identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs), but which provide a range of ecosystem services from their ecological infrastructure.</p> <p><u>Primary Objective:</u> Minimise habitat and species loss through strategic landscape planning and ensure basic ecosystem functionality</p>
<b>Heavily modified</b>	<p>Most of the Tournée 2 Solar PV Park occurs within <b>Heavily Modified</b> areas (approximately 162.6 ha). These are areas currently modified to such an extent that any valuable biodiversity and ecological functions have been lost in this case the cultivated areas.</p> <p><u>Primary Objective:</u> Manage the land-use in a biodiversity-friendly manner aiming to maximise ecological functionality.</p>
<b>Moderately modified - Old lands</b>	<p>The presence of <b>Moderately Modified</b> areas (old lands) are generally adjacent to the Heavily Modified areas (approximately 8.4 ha), these areas are old cultivated lands that have been allowed to recover (within the last 80 years), and support some natural vegetation. Although biodiversity patterns and ecological functioning may have been compromised, the areas may still play a role in supporting biodiversity and providing ecosystem services.</p> <p><u>Primary Objective:</u> Moderately modified areas (old lands) should be stabilised and restored where possible, especially for soil carbon and water-related functionality. In old lands, stabilise ecosystems and manage them to restore ecological functionality, particularly soil carbon and water related functionality, using indigenous plant cover. Old lands should be burnt and grazed appropriately.</p>
<b>Critical Biodiversity Area: Optimal</b>	<p>A very small portion of the proposed Tournée 2 Solar PV Park is identified as Optimal CBA (approximately 0.33 ha), located in the lower western corner of the proposed Tournée 2 Solar PV Park. These are areas required to meet targets and with irreplaceability values of more than 80%; Critical linkages or pinch-points in the landscape that must remain natural; and often include Critically Endangered (CR) ecosystems, or hosts species of conservation concern.</p> <p>The CBA Optimal Areas (previously called ‘important and necessary’ in the Mpumalanga Biodiversity Conservation Plan (MBCP) are the areas optimally located to meet both the various biodiversity targets and other criteria defined in the analysis. Although these areas are not ‘irreplaceable’ they are the most efficient land configuration to meet all biodiversity targets and design criteria.</p> <p><u>Primary Objective:</u> Maintain in a natural state with no loss of ecosystems, functionality or species; some flexibility in land-use options.</p>
<b>NATIONAL PROTECTED AND CONSERVATION AREAS – VARIOUS DATABASES</b>	
<b>SAPAD (2022, Q2); SACAD (2022, Q2); NPAES (2018); and IBA (2015)</b>	<p>The SAPAD<sup>3</sup> (2022, Q3) and SACAD (2022, Q3) databases did not identify any areas that are nationally protected or of national conservation importance located within the Tournée 2 Solar PV Park boundary or within 10 km of the Tournée 2 Solar PV Park.</p> <p>The NPAES (2018) database did not identify any priority focus areas within the Tournée 2 Solar PV Park, however, is located adjacent to the Tournée 2 Solar PV Park (on the north western boundary). This however this does not intersect with the distribution of the Tournée 2 Solar PV Park itself and therefore the proposed development will not impact any NPAES focus areas (Figure 6).</p>

<sup>3</sup> **SAPAD (2022):** The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the “System of Protected Areas”, which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

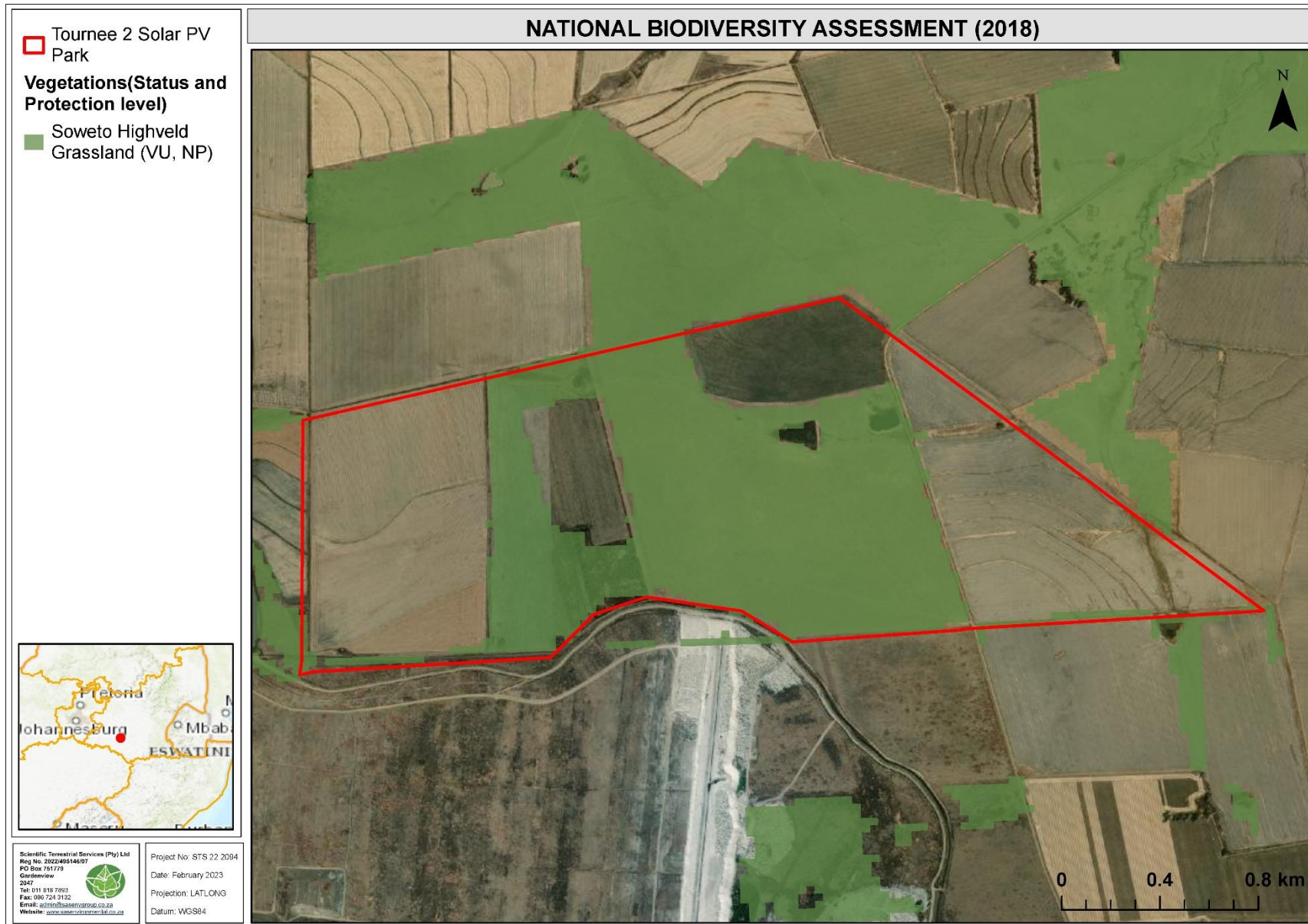


	The IBA (2015) database did not identify the any IBA within the proposed of the Tournée 2 Solar PV Park.
<b>NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL (accessed 2022)</b>	
<p>The Screening Tool is intended to allow for pre-screening of sensitivities in the landscape to be assessed within the Environmental Authorisation process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below:</p> <ul style="list-style-type: none"> <li>➤ <b>Very High:</b> Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km<sup>2</sup> are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under <b>CR, EN, or VU D</b> criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa's National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.</li> <li>➤ <b>High:</b> Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level.</li> <li>➤ <b>Medium:</b> Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level.</li> <li>➤ <b>Low:</b> Areas where no Species of Conservation Concern (SCC) are known or expected to occur.</li> </ul>	
<b>Animal Species Figure 10</b>	<p>For the Animal Species theme, the Tournée 2 Solar PV Park is considered to have a <b>medium sensitivity</b> due to potential suitable habitat for the following trigger species:</p> <ul style="list-style-type: none"> <li>- <b>Medium:</b> <u>Aves:</u> <i>Tyto capensis</i> (African Grass Owl; VU), <i>Hydroprogne caspia</i> (Caspian tern; VU) and <i>Eupodotis senegalensis</i> (White Bellied Korhaan; VU). <u>Insecta:</u> <i>Lepidochrysops procera</i> (Potchefstroom Blue; Rare) and <u>Mammalia:</u> <i>Crocidura maquassiensis</i> (Maquassie Musk Shrew; VU).</li> </ul>
<b>Plant Species Figure 11</b>	<p>For the Plant Species theme, the screening tool identified the Tournée 2 Solar PV Park as a <b>low and medium sensitivity</b> area. The majority of the Tournée 2 Solar PV Park is considered to have a <b>low sensitivity</b>, with a portion in the centre of the Tournée 2 Solar PV Park identified as a medium sensitivity areas. The medium sensitivity is associated with the “other natural areas” as identified by the MBSP (2019). The sensitivity of the Tournée 2 Solar PV Park is due to the potential presence of habitat for the following trigger species:</p> <ul style="list-style-type: none"> <li>- <b>Medium:</b> Sensitive species 1252 (VU) and Sensitive species 691(VU).</li> </ul>
<b>Terrestrial Sensitivity Figure 12</b>	The Terrestrial Sensitivity for the entire Tournée 2 Solar PV Park is considered to be a <b>very high</b> . The trigger features include <b>CBA 2 and a VU ecosystem</b> .
<b>RENEWABLE ENERGY DEVELOPMENT ZONES AND CORRIDORS- FIGURE 8</b>	
The proposed Tournée 2 Solar PV Park is not located within any Renewable Energy Development Zone (REDZ).	
<b>STRATEGIC TRANSMISSION CORRIDORS- FIGURE 9</b>	
The proposed Tournée 2 Solar PV Park is not located within any Strategic Transmission Corridors.	
<p>The five strategic transmission corridors were assessed as part of the 2016 Electricity Grid Infrastructure (EGI) Strategic Environmental Assessment (SEA). These corridors were Gazetted for implementation on 16 February 2018 in government Gazette 41445, GN 113. The gazette documented notice given by the minister of environmental affairs of alternative procedures to be followed when applying for environmental authorisation for large scale electricity transmission and distribution development activities, identified in terms of section 24(2)(a) of the NEMA in the identified strategic transmission corridors (i.e., Areas declared as geographical areas of strategic importance).</p>	

NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; SACAD = South African Conservation Areas Database; NPAES = National Protected Areas Expansion Strategy; IBA = Important Bird Area; MAP = Mean Annual Precipitation; MAT = Mean Annual Temperature; MAPE = Mean Annual Potential Evaporation; MFD = Mean Frost Days; MASMS = Mean Annual Soil Moisture Stress (% of days when evaporative demand was more than double the soil moisture supply); CBA = Critical Biodiversity Areas; ESA = Ecological Support Area.







**Figure 4: The remaining extent of the vegetation type associated with the Tournée 2 Solar PV Park according to the National Biodiversity Assessment (NBA, 2018).**



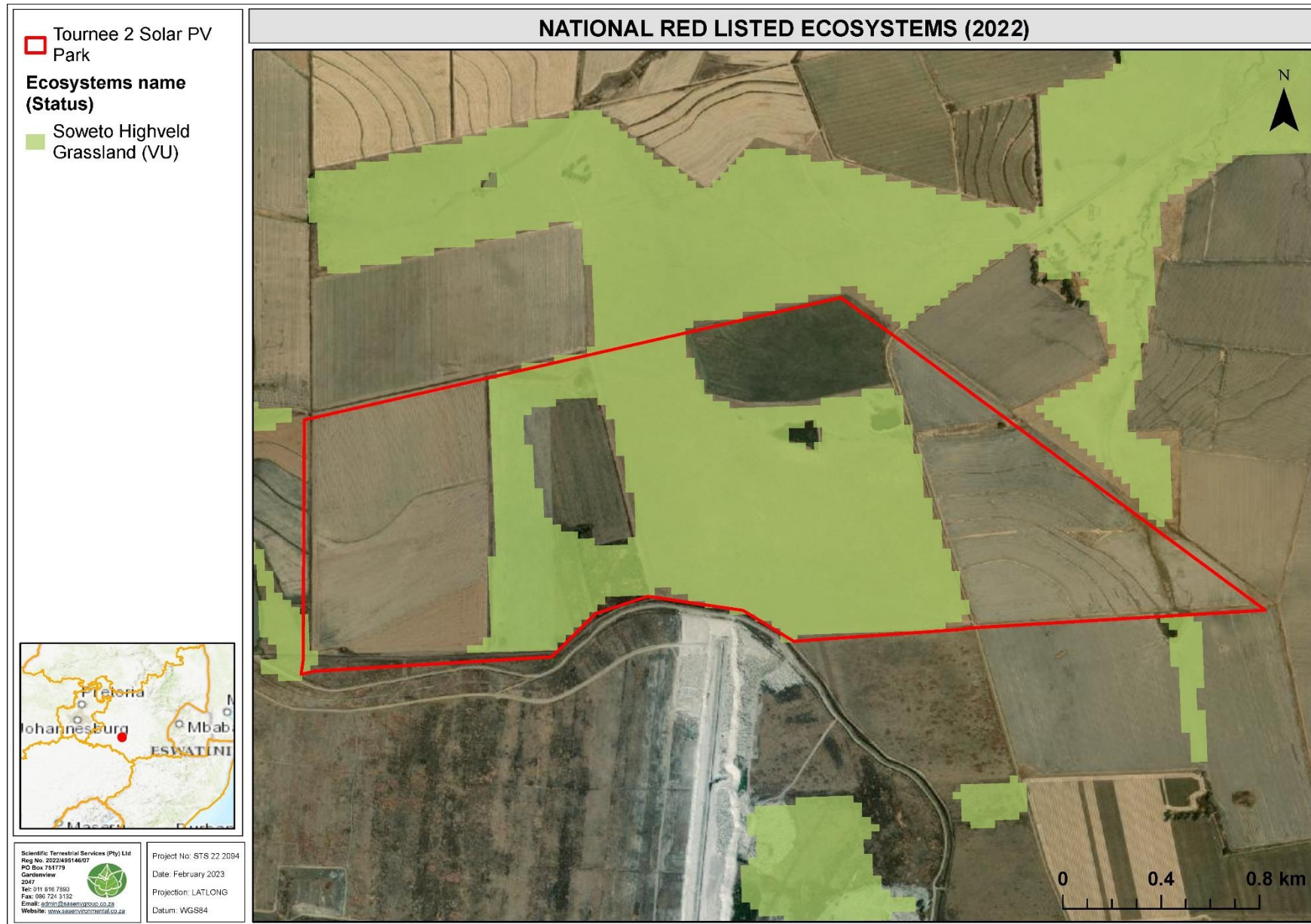


Figure 5: The Tournée 2 Solar PV Park in relation to the remaining extent of the RLE (2022, database).





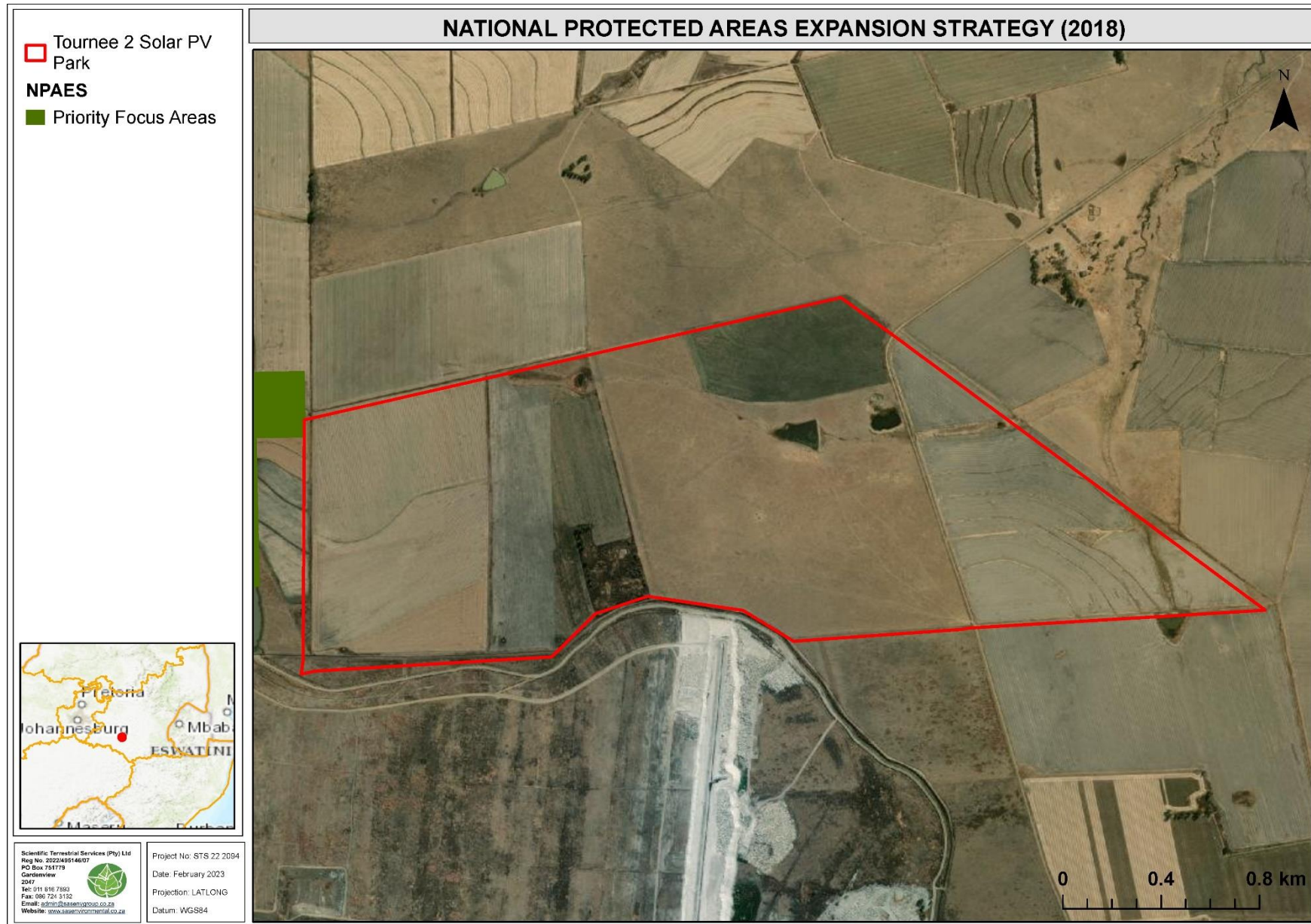


Figure 6: National Protected Areas Expansion Strategy areas adjacent to the Tournée 2 Solar PV Park as indicated by the NPAES database (2018).



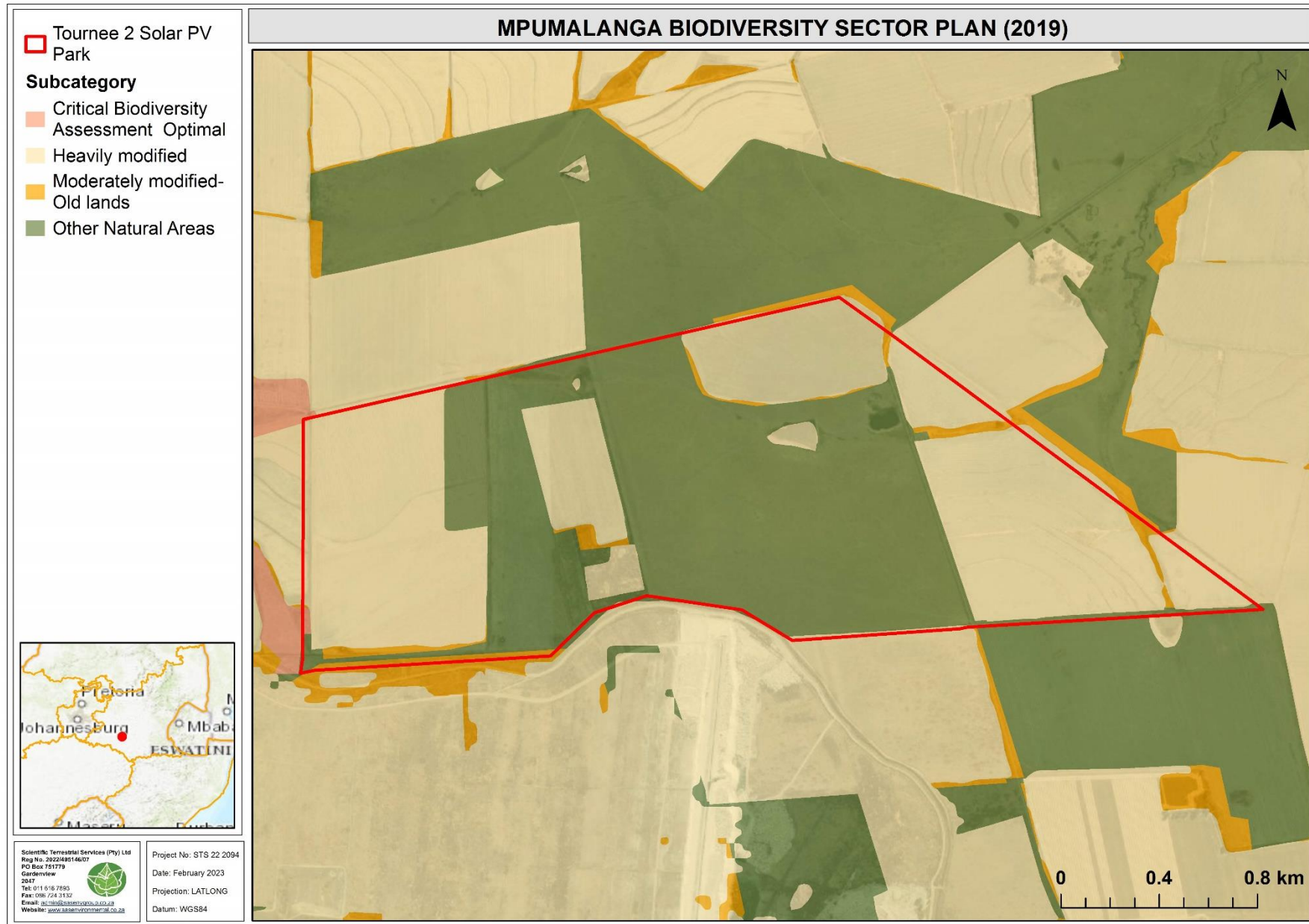


Figure 7: The Tournée 2 Solar PV Park in relation to the Mpumalanga Biodiversity Sector Plan Version 2 (MBSP, 2019).





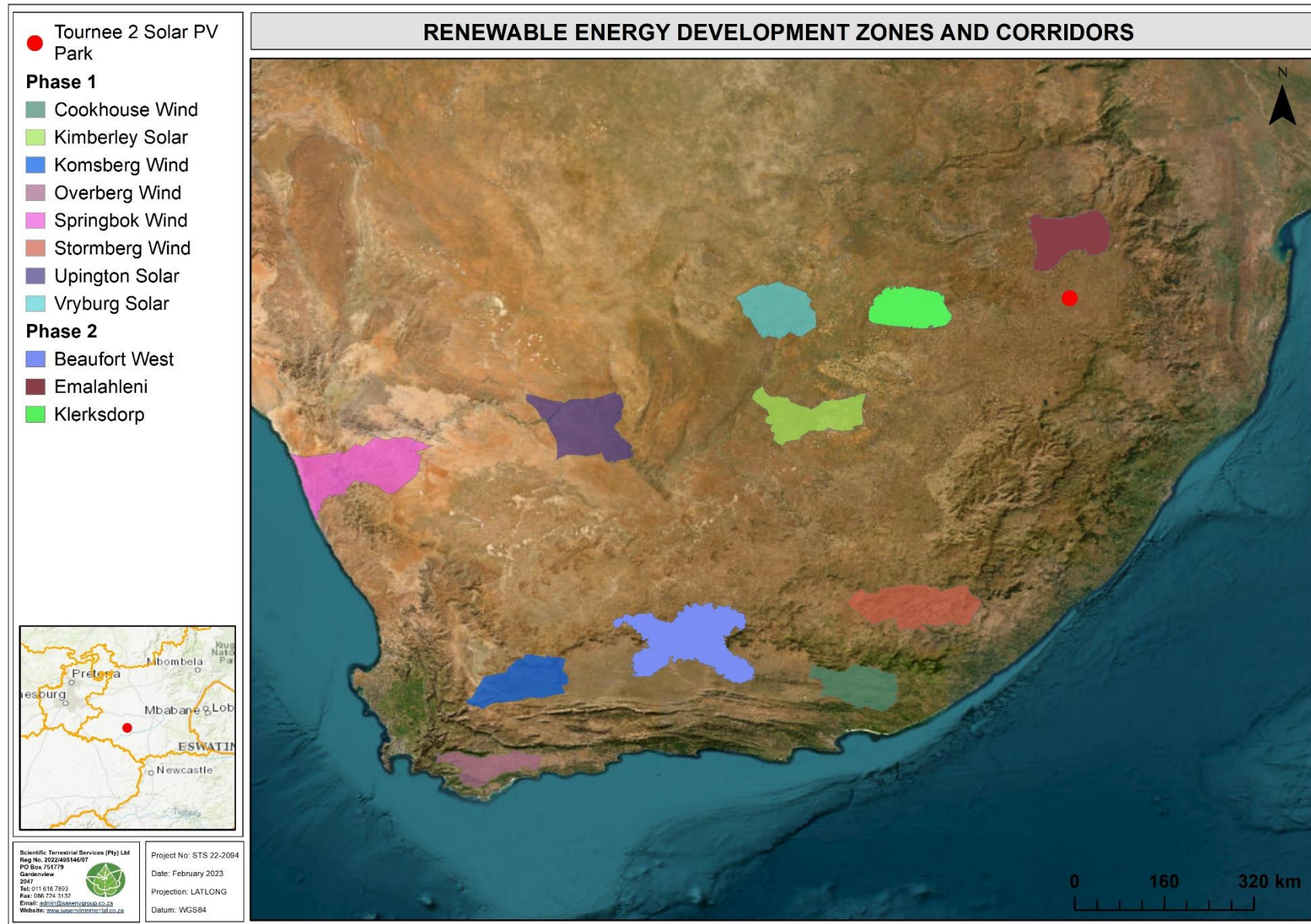


Figure 8: REDZ as part of the Phase 1 and Phase 2 SEA for Wind and Solar PV Energy in South Africa, 2019.





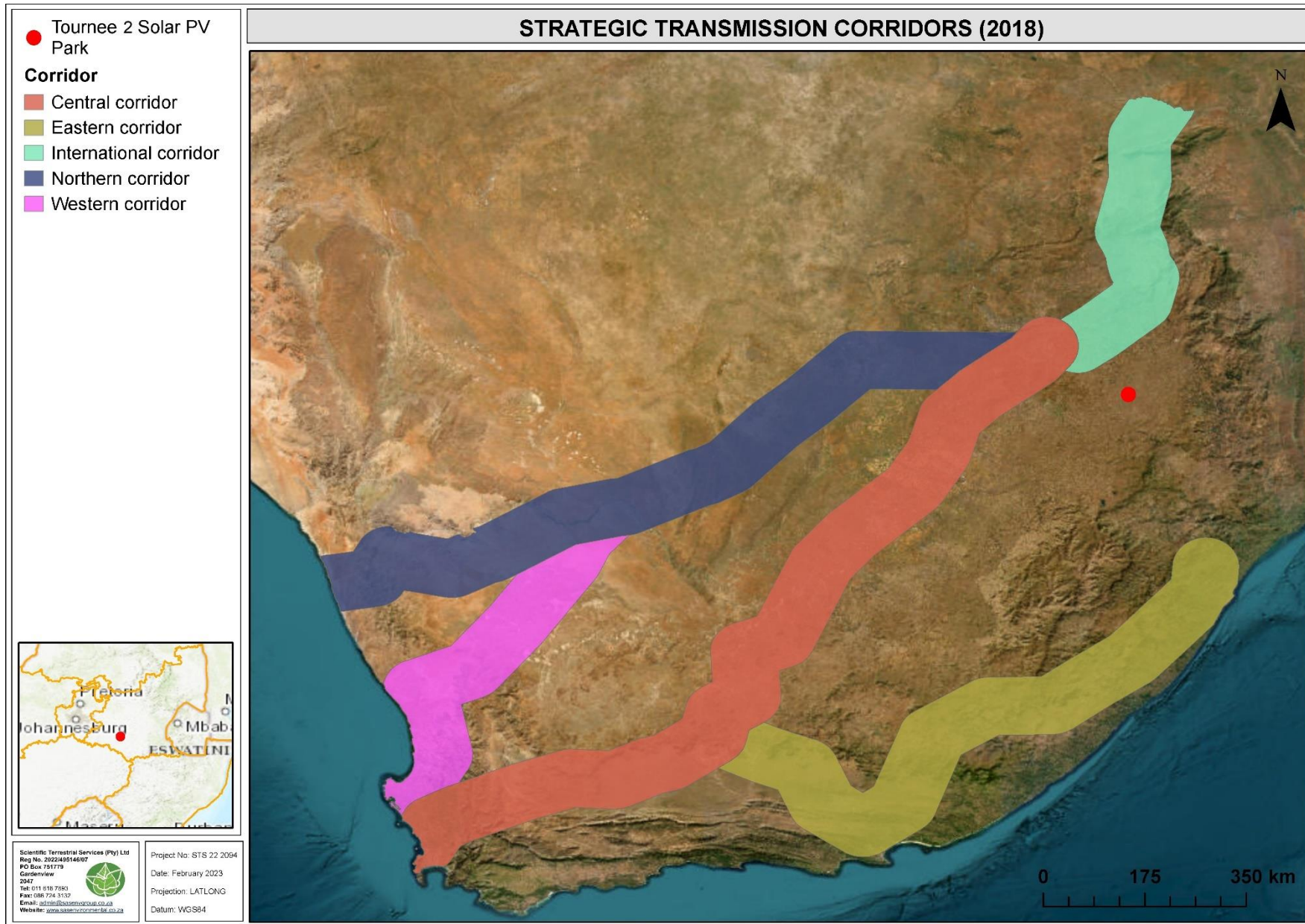


Figure 9: Strategic Transmission Corridors as set out by the EGI SEA.





## Screening Report Map - Animal Species Theme



Figure 10: Animal Species Theme sensitivity for the Tournée 2 Solar PV Park as obtained from the screening tool (accessed 2023).



## Screening Report Map - Plant Species Theme



Figure 11: Plant Species Theme sensitivity for the Tournée 2 Solar PV Park as obtained from the screening tool (accessed 2023).



## Screening Report Map - Terrestrial Biodiversity Theme

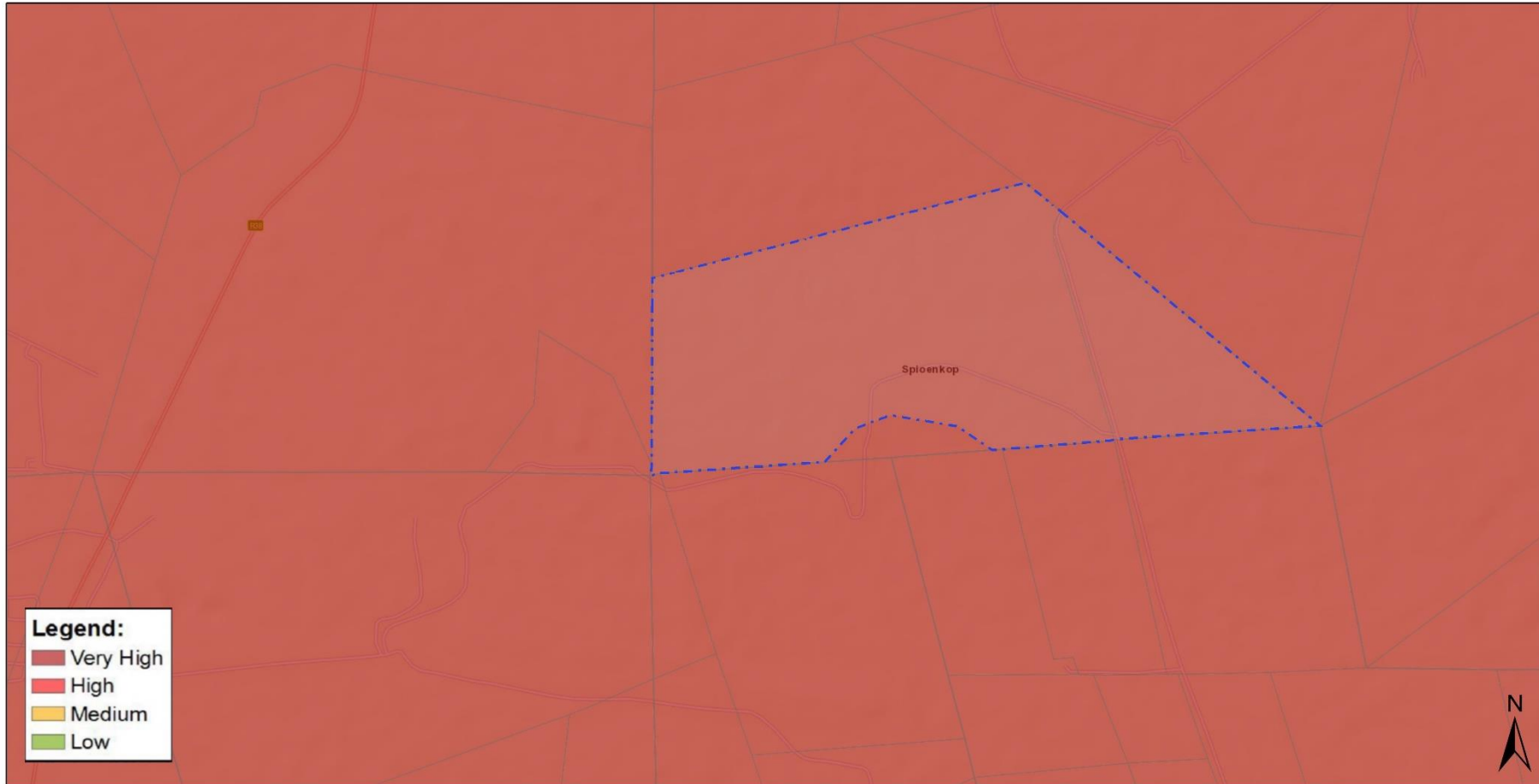


Figure 12: Terrestrial Biodiversity Theme sensitivity for the Tournée 2 Solar PV Park as obtained from the screening tool (accessed 2023).



## 4. PRELIMINARY FIELD ASSESSMENT RESULTS

A site visit was conducted between the 6th and 9th of January 2023 to comply with the NEMA associated EIA Regulations (Government Notice (GN) number R982, GN R983, R984 and R985 of 2014). The preliminary findings of the site assessment, as well as potential cumulative impacts for consideration and a plan of study for the EIA phase, is provided within this assessment.

### 4.1 Floral Assessment

Preliminary results of the floral assessment are presented below.

#### 4.1.1 Ground-truthed vegetation characteristics

During the site assessment, three habitat units were identified namely (Figure 12 to Figure 13):

1. **Grassland Habitat:** This grassland vegetation is widespread within the proposed extent of the Tournée 2 Solar PV Park, mostly located in the centre of the Tournée 2 Solar PV Park area and is interspersed by cultivated lands and Freshwater Ecosystems. The dominant land-use associated with these remaining sections of grasslands is grazing. The vegetation mostly consists of **short-tall, open-closed grasslands** (Edwards, 1983) and is still regarded as indigenous vegetation (as per NEMA definition<sup>4</sup>). This habitat unit has a high diversity of graminoid species, however, is dominated by *Eragrostis tef* with high abundance of *Calamagrostis epigejos* var. *capensis*, *Digitaria eriantha*, *Helictotrichon turgidulum* and *Setaria sphacelate* var. *sphacelate*. The Grassland habitat had a high diversity and abundance of several Alien Invasive Plant (AIP) species, especially *Cirsum vulgare*, *Cosmos bipinnatus* and *Verbena bonariensis* being widespread within the Grassland habitat. The Grassland Habitat is no longer considered to be a representative of the reference vegetation type (i.e., Soweto Highveld Grassland) in terms of species composition. Since Mucina and Rutherford (2006) described Soweto Highveld Grasslands as being dominated almost entirely by *Themeda triandra* accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*, this was not the case within these Grasslands. While the habitat integrity is diminished, the Grassland Habitat is still considered to be in fair ecological condition (i.e., areas that are moderately modified, semi-natural. An ecological condition class in

<sup>4</sup> NEMA Listing Notice definition of indigenous vegetation: Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.



which ecological function is maintained even though composition and structure have been compromised);

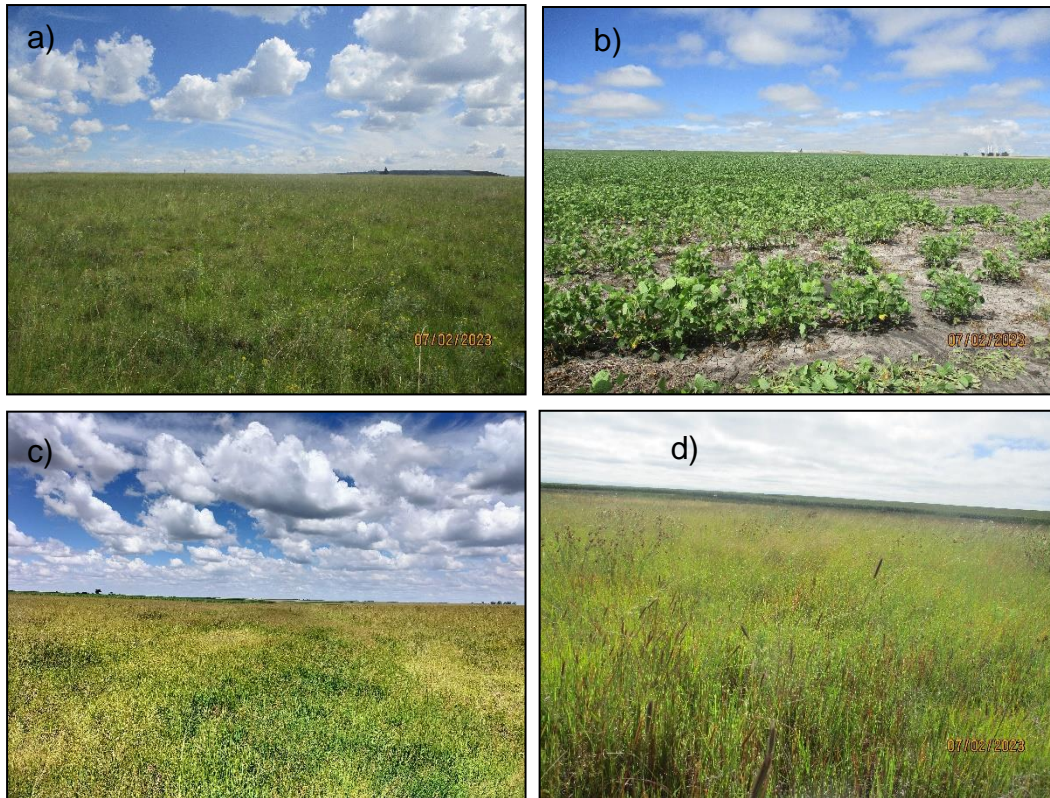
2. **Transformed Habitat:** Four relatively large portions of the Tournée 2 Solar PV Park are cultivated with *Zea mays* (i.e., corn) and *Glycine max* (i.e., soybean). These areas have been significantly transformed and are no longer considered to be indigenous vegetation (as per NEMA definition). The boundaries of the cultivated areas are associated with a high abundance of AIPs, including *Ipomoea purpurea*, *Datura stramonium*, *Crisum vulgare* and *Cosmos bipinnatus*. This habitat unit as such is not representative of the reference vegetation type and is not considered to be of ecological and conservation importance from a floral perspective. The habitat integrity is severely diminished and the Transformed habitat is in poor ecological condition (i.e., areas that are severely or irreversibly modified. An ecological condition class in which ecological function has been compromised in addition to structure and composition);
3. **Freshwater Ecosystem:** The Freshwater Habitat meets the definition of a watercourse in terms of the definition contained within the National Water Act, 1998 (Act No. 36 of 1998) (NWA)<sup>5</sup>, furthermore the presence of provincially protected floral species present within the Freshwater Habitat indicates that these systems are important from a floral biodiversity point of view. The vegetation structure of the Freshwater Ecosystem was considered to be **tall, closed grassland** with a high abundance of grass species and sedges; most abundant of which were *Paspalum dilatatum*, *Setaria sphacelata* var. *sphacelata*, *Setaria sphacelata* var. *torta*, and sedges such as, *Kyllinga erecta* var. *erecta* and *Cyperus rotundus*. The overall habitat integrity of the Freshwater Habitat was considered to be moderately intact and the habitat was considered to be within a good ecological condition (i.e., areas that are natural or near-natural. An ecological condition class in which composition, structure and function are still intact or largely intact). Please refer to the Freshwater Scoping Report for further details regarding the freshwater ecosystems (SAS 22-1193).

<sup>5</sup> The Freshwater Habitat meets the definition of a watercourse in terms of the definition contained within the National Water Act, 1998 (Act No. 36 of 1998) (NWA):

- A river or spring;
  - A natural channel which water flows regularly or intermittently;
  - A wetland, dam or lake into which, or from which, water flows; and
  - Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse;
- and a reference to a watercourse includes, where relevant, its bed and banks.







**Figure 13: Representative photographs of the vegetation habitat units. a) Grassland Habitat, b) Transformed Habitat and c) and d) Freshwater Ecosystem within the proposed Tournée 2 Solar PV Park layout.**





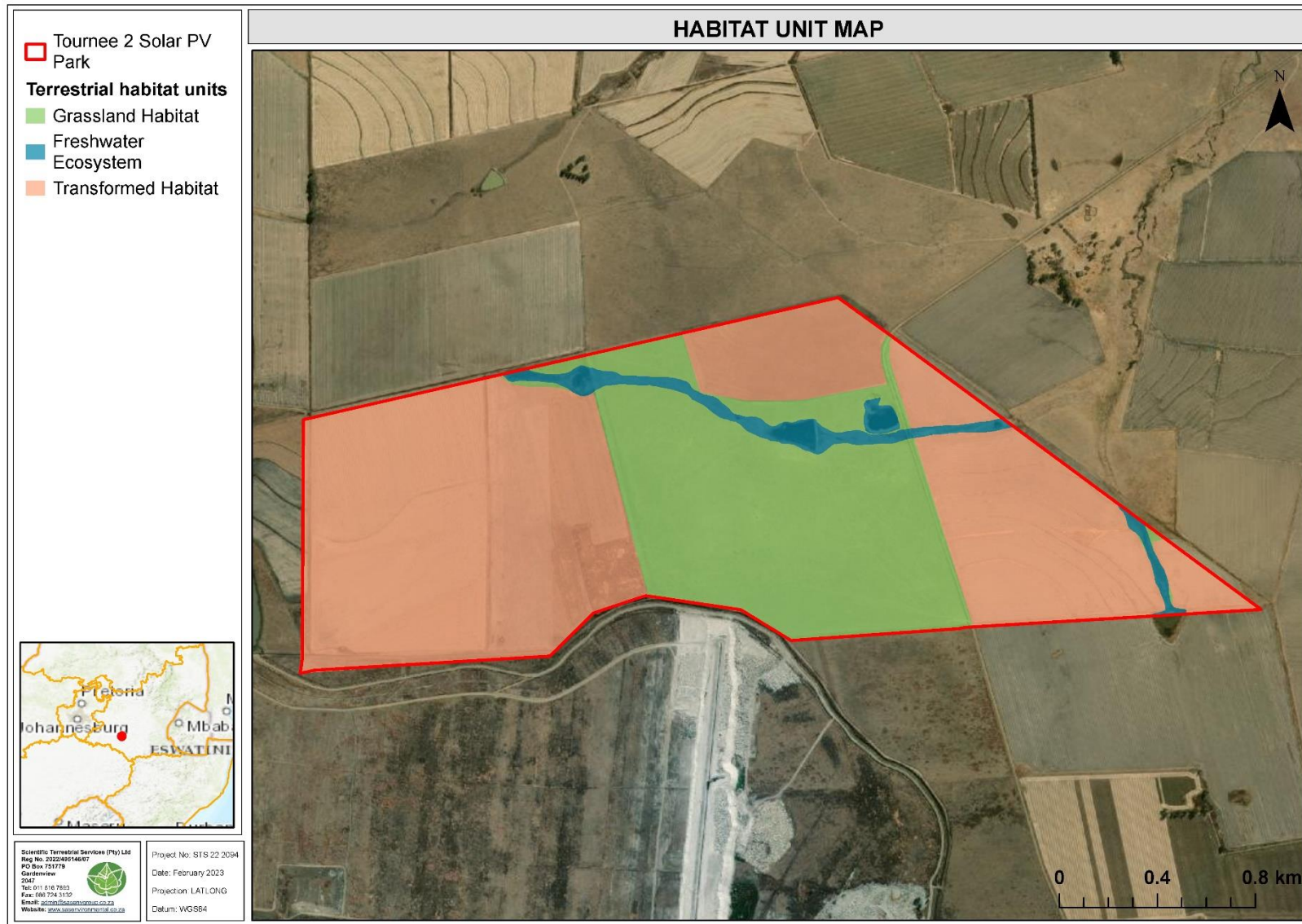


Figure 14: Terrestrial Habitat Units for Tournée 2 Solar PV Park.



The Online National Web Based Environmental Screening Tool identified the Tournée 2 Solar PV Park to be in a **medium sensitivity** area for the Plant Species Theme (Triggering species included Sensitive species 1252 (VU) and Sensitive Species 691 (VU)). The site visit was undertaken during the summer months which coincide with these species' flowering time; however, these species were not found during the site assessment and habitat for this species (i.e., Wooded and mesic places, moister bushveld and damp wooded mountain kloofs) to occur is unlikely (while Sensitive species 691 is generally associated with Undulating grasslands and damp areas the POC is low due to historic land-use). For the Terrestrial Biodiversity Theme, Tournée 2 Solar PV Park has a **very high sensitivity**. The very high sensitivity was triggered by the presence of an Optimal CBA area and VU ecosystem. During the site assessment, the area associated with the CBA was not confirmed to be representative for the targets set for a CBA as these areas were transformed by current cultivation areas. The remaining Grassland habitat is no longer considered to be representative of the reference VU ecosystem (namely, Soweto Highveld Grassland). This is as a result of the underrepresentation of certain dominant species (e.g., *Themeda triandra*, which was encountered on site but in a very low abundance and restricted distribution with the Tournée 2 Solar PV Park), found in Soweto Highveld Grassland vegetation type and the dominance of grazing grasses (e.g., *Eragrostis tef* and *E. plana*) and abundance of AIPs, most likely the result of the historic and current land-use management practices.

No threatened SCC (i.e., Red Data Listed (RDL) plants or TOPS listed species), in terms of Section 56(1) of the NEMBA, were recorded during the site assessment. No protected tree species as per the NFA, were identified during the site assessment for the Tournée 2 Solar PV Park footprint area. The Grassland Habitat and Freshwater Ecosystem did however have several provincially protected species in terms of the MNCA Schedule 11 protected species list. Species encountered on site are listed below:

- *Eucomis autumnalis*;
- *Boophone disticha*; and
- *Gladiolus elliotii*.

## 4.2 Faunal assessment

During the site assessment between 6th of February and the 9th of February 2023, a moderate abundance of faunal species (in comparison to expected species presence) from different classes were observed within the Tournée 2 Solar PV Park. One mammal SCC was confirmed within the Tournée 2 Solar PV Park, as well as suitable habitat for several other potential SCC



known to occur in the greater area. The below sections provide a brief breakdown of the faunal classes represented in the Tournée 2 Solar PV Park.

## Mammals

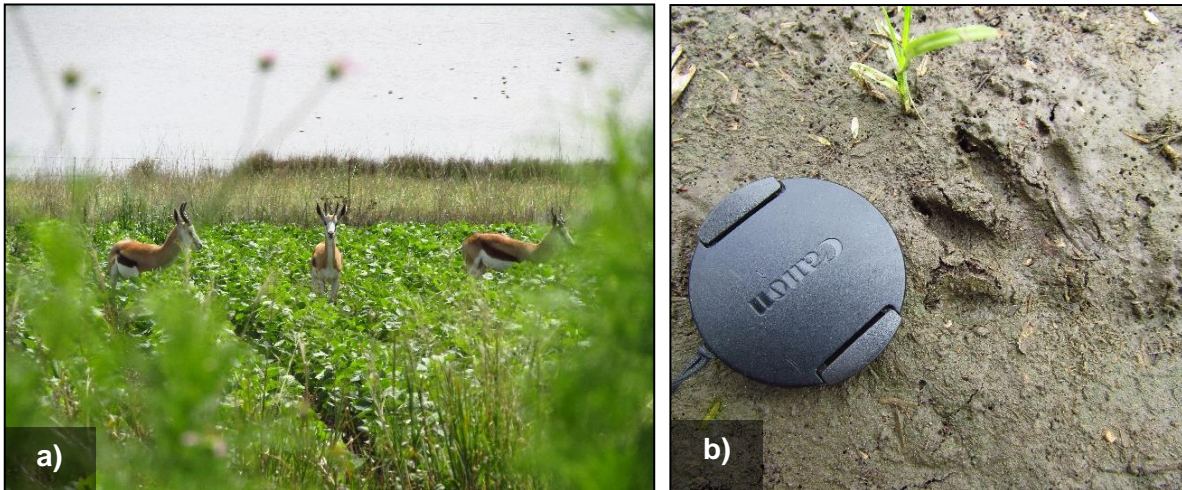
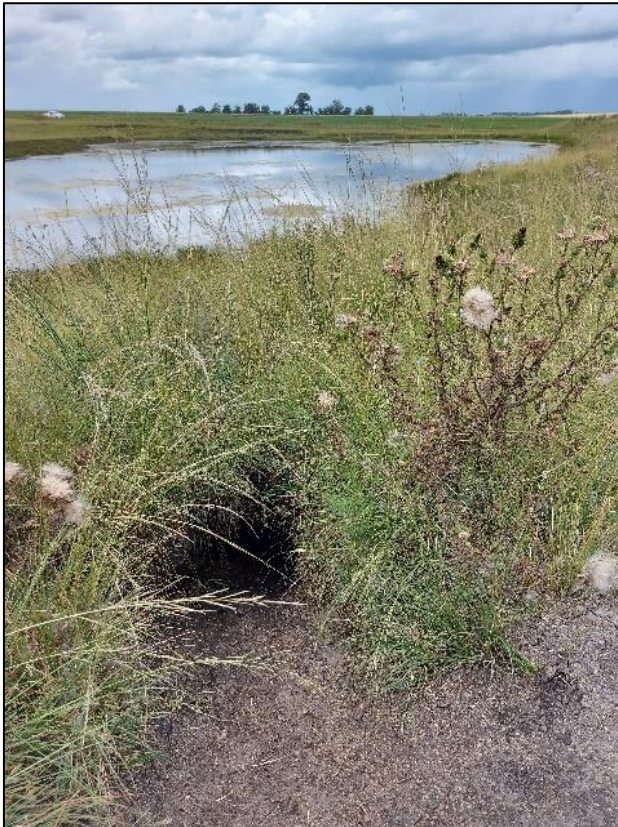


Figure 15: a) *Antidorcas marsupialis* (Springbuck, LC); b) Spoor of *Atilax paludinosus* (Water mongoose, LC).

Signs of common mammal species activity / presence such as *Hystrix africaeaustralis* (Cape Porcupine, LC), *Atilax paludinosus* (Water mongoose, LC) and *Antidorcas marsupialis* (Springbuck, LC) were readily observed within the Tournée 2 Solar PV Park. A single mammal SCC was observed during the field assessment, namely *Aonyx capensis* ssp. *capensis* (Cape Clawless Otter, NT). The Tournée 2 Solar PV Park falls within the distribution range of several other mammal SCC, which may make use of the Tournée 2 Solar PV Park either as a movement corridor, for permanent habitats or as part of a larger home range. The background assessments have further indicated that many of the potential SCC have been recorded in the surrounding areas.



## Herpetofauna (Reptiles and Amphibians)



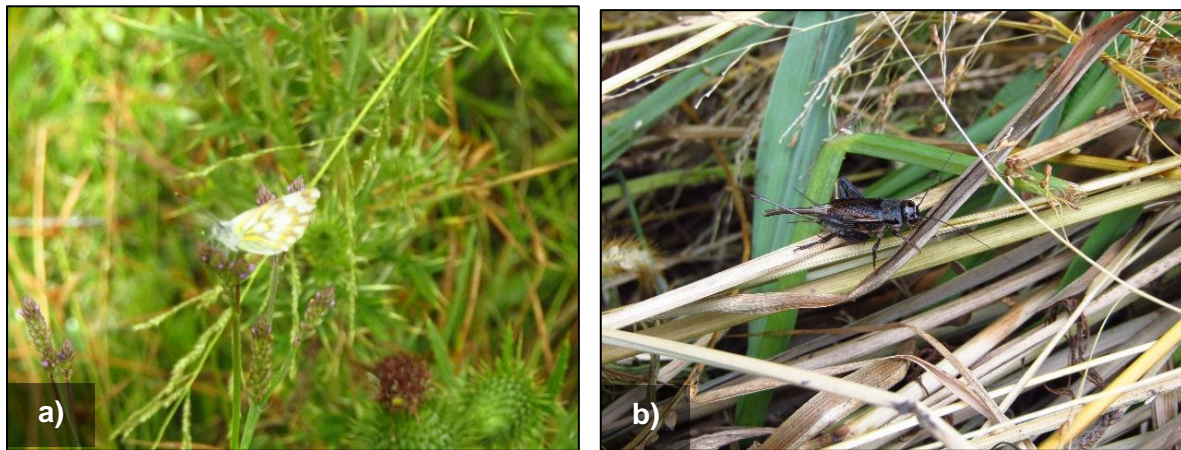
**Figure 16: a) Burrow of *Hystrix africaeausstralis* (Cape Porcupine, LC) that will be used by reptile for refuge.**

During the site assessment, no reptile SCC were observed whilst a low abundance of common reptile species were recorded. Reptiles are inherently difficult to observe during assessments of short duration, more especially in grassland habitats. The relatively low reptile activity was also likely attributable to the weather patterns experienced during the site assessment, with cloud cover and rain resulting in many reptile species opting to decrease their daily activity patterns and seek shelter rather than be exposed to the elements. Although there is suitable habitat available and reptile species distribution ranges overlap with the site, background studies and data collected indicates that there is likely a low potential for reptile SCC to occur within the Tournée 2 Solar PV Park.

Amphibian populations are likely to be focused within the freshwater ecosystem especially areas with permanent water. *Pyxicephalus adspersus* (Giant African Bullfrog, NT) is likely to be present within the Freshwater Ecosystem and Grassland habitat unit. Their habitat includes a wide variety of environments including savannahs, grasslands and freshwater habitat. When not breeding, individuals can travel up to 4 km from water, foraging for insects and may also aestivate in grassland greater than 2km's from water sources. Their breeding habitat, in the form of shallow, stagnant temporary waters in wetlands and pans, are present in or close to the study area. Adults may be buried beneath the soil in the dry season.

## Invertebrates

The Tournée 2 Solar PV Park invertebrate diversity was low during the site assessment and dominated by the following orders: Lepidoptera, Coleoptera and Orthoptera. This can be due to agricultural activities in the area as insecticide is used to control pests on agricultural fields and will negatively affect invertebrates in the area. A number of invertebrate SCC have the potential to occur in the immediate surrounding areas especially the freshwater ecosystem.



**Figure 17: a) *Belenois aurota* (Brown-veined White, LC); b) *Gryllus bimaculatus* (Southern Field Cricket, LC).**

From the field assessments undertaken in 2023, a single mammal SCC was recorded within the Tournée 2 Solar PV Park, whilst suitable habitat, food resources and habitat connectivity is present for several other SCC including provincially protected species.

The Animal Species Theme for the Tournée 2 Solar PV Park was identified to be of medium sensitivity for the following species: *Tyto capensis* (African Grass Owl, VU), *Eupodotis senegalensis* (White Bellied Korhaan, VU), *Lepidochrysops procera* (Potchefstroom Blue, Rare) and *Crocidura maquassiensis* (Maquassie Musk Shrew, VU). The avifaunal SCC however do not form part of this study and associated reporting as a separate avifaunal study is being undertaken. During the EIA phase other SCC likely to occur will be further discussed.

More information will be provided during the EIA phase. Sensitive habitat types as well as detailed lists of faunal SCC, or species protected under the MPCA will be provided in the full biodiversity assessment reports.

## 5. SENSITIVITY

For the Plant Species theme, the screening tool identified the Tournée 2 Solar PV Park as a low and medium sensitivity area. The majority of the Tournée 2 Solar PV Park is considered to have a low sensitivity, with a portion in the centre of the Tournée 2 Solar PV Park identified as a medium sensitivity areas. The triggered sensitive species include Sensitive Species 1252

(VU) and Sensitive species 691(VU). The medium sensitivity for the Plant Species Theme was disputed and the low sensitivity confirmed.

The Screening Tool assigned the Tournée 2 Solar PV Park to have a very high sensitivity for the terrestrial biodiversity theme, for which the triggered sensitivity features for the very high sensitivity include a CBA 2 and presence of VU ecosystem. The very high sensitivity for the Terrestrial Biodiversity Theme is only supported for the Freshwater Ecosystem Habitat, based on the representative nature of this habitat unit to the reference VU Soweto Highveld Grassland vegetation type.

For the Animal Species theme, the Tournée 2 Solar PV Park is considered to have a medium sensitivity due to potential suitable habitat for the following trigger species: Aves: *Tyto capensis* (African Grass Owl; VU) and *Eupodotis senegalensis* (White Bellied Korhaan; VU), Insecta: *Lepidochrysops procera* (Potchefstroom Blue; Rare) and Mammalia: *Crocidura maquassiensis* (Maquassie Musk Shrew; VU).

The medium and low sensitivity for the Animal Species Theme for the Tournée 2 Solar PV Park the Grassland and Freshwater habitat is supported for Mammal, Herpetofauna and invertebrate species.

Based on the ground-truthed results of the site visit, Figure 17 below presents the sensitivity of each identified habitat unit. These sensitivities are more refined than the sensitivities provided by the Screening Tool due to the areas being ground-truthed and due to the consideration of different aspects, such as the presence or potential for floral SCC (both threatened species as well as protected species), habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity (compared to a reference type).





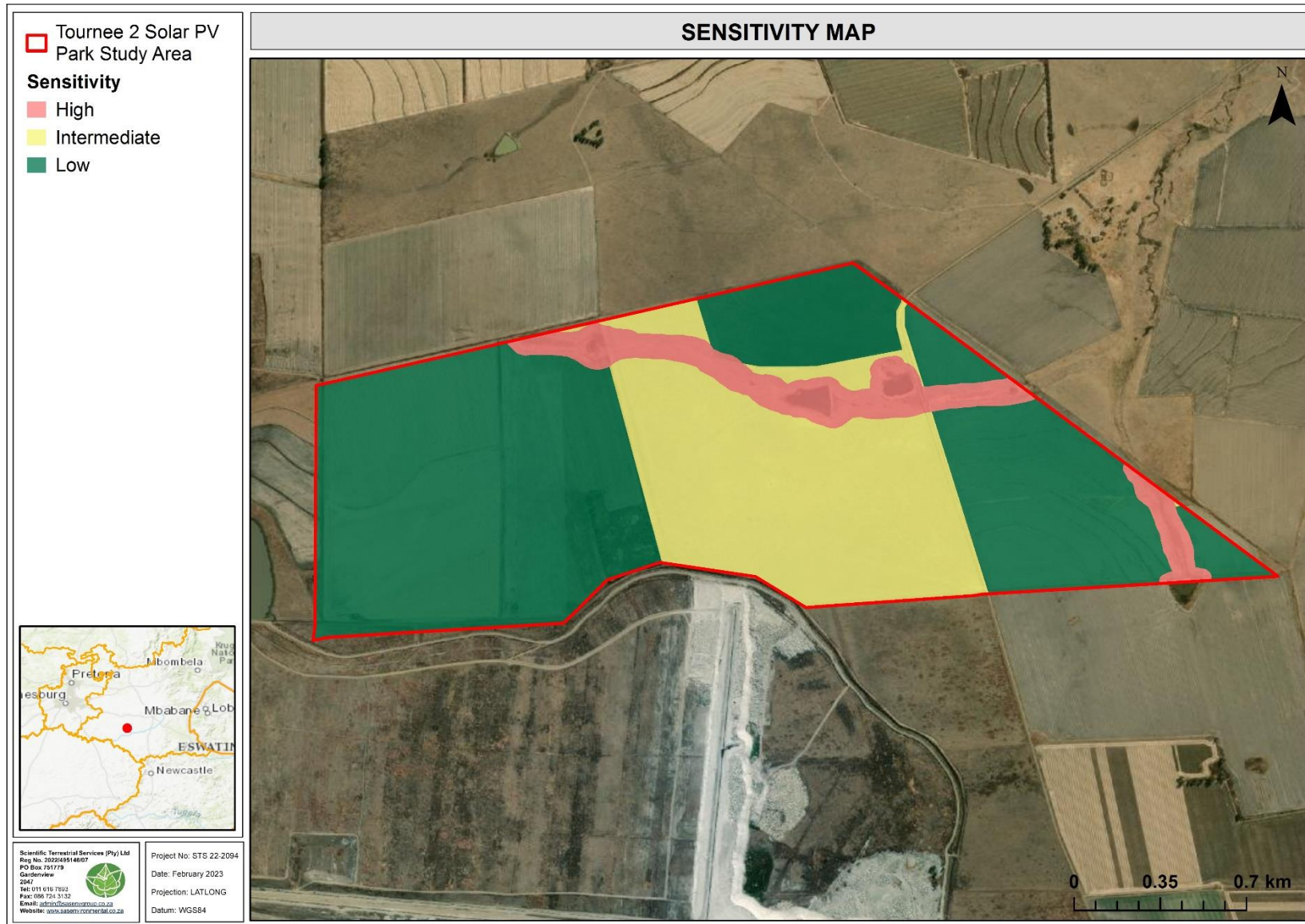


Figure 18: Sensitivity map for the Tournée 2 Solar PV Park.



## 6. INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARD 6

Based on the Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) of the International Finance Corporation (IFC), the below table categorises the observed habitat units into the relevant IFC defined habitat categories.

The IFC habitat categories are defined as follows:

### ***Modified Habitat***

Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.

This Performance Standard applies to those areas of modified habitat that include significant biodiversity value, as determined by the risks and impacts identification process required in Performance Standard 1. The client should minimise impacts on such biodiversity and implement mitigation measures as appropriate.

### ***Natural Habitat***

Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.

The client will not significantly convert or degrade natural habitats, unless all of the following are demonstrated:

- No other viable alternatives within the region exist for development of the project on modified habitat;
- Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and
- Any conversion or degradation is mitigated according to the mitigation hierarchy.

In areas of natural habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible. Appropriate actions include:



- Avoiding impacts on biodiversity through the identification and protection of set-asides;
- Implementing measures to minimise habitat fragmentation, such as biological corridors;
- Restoring habitats during operations and/or after operations; and
- Implementing biodiversity offsets.

### **Critical Habitat**

Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to Critically Endangered and/or Endangered species; (ii) habitat of significant importance to endemic and/or restricted-range species; (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species; (iv) highly threatened and/or unique ecosystems; and/or (v) areas associated with key evolutionary processes.

In areas of critical habitat, the client will not implement any project activities unless all of the following are demonstrated:

- No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not critical;
- The project does not lead to measurable adverse impacts on those biodiversity values for which the critical habitat was designated, and on the ecological processes supporting those biodiversity values;
- The project does not lead to a net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time; and
- A robust, appropriately designed, and long-term biodiversity monitoring and evaluation program is integrated into the client's management program.

In such cases where a client is able to meet the requirements defined in paragraph 17, the project's mitigation strategy will be described in a Biodiversity Action Plan and will be designed to achieve net gains of those biodiversity values for which the critical habitat was designated.

In instances where biodiversity offsets are proposed as part of the mitigation strategy, the client must demonstrate through an assessment that the project's significant residual impacts on biodiversity will be adequately mitigated to meet the requirements of paragraph 17.





The IFC's Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources, provides 140 Guidance Notes (GNs). The below list was determined to be applicable to the Tournée 2 Solar PV Park Project (with a more in-depth assessment of the IFC standards during the EIA phase, applicable IFC standards can be added and/or removed from the lists provided below):

- GN9. The requirements for the baseline study will vary depending on the nature and scale of the project. For sites with potentially significant impacts on natural and critical habitats and ecosystem services, the baseline should include field surveys over multiple seasons, to be undertaken by competent professionals and with the involvement of external experts, as necessary. Field surveys and assessments should be recent, and data should be acquired for the direct project footprint, including related and associated facilities, the project's area of influence, and potentially beyond;
- GN22. For projects located in critical habitat (including legally protected, and internationally recognized areas), clients must ensure that external experts with regional experience are involved in the biodiversity and/or critical habitat assessment. If habitat is critical due to the presence of critically endangered or endangered species, recognized species specialist must be involved (for example, including individuals from IUCN Species Survival Commission Specialist Group). In areas of critical habitat, clients will benefit from establishing a mechanism for external review of the projects risk and impacts identifications process and proposed mitigation strategy. This is especially relevant where uncertainty is high, where potential impacts are complex and/or controversial, and/or where no precedent exist for proposed mitigations (such as some types of offsets). Such a mechanism would also promote the sharing of good international practice between projects and improve transparency in decision making.
- GN36. Clients should endeavor to site the project in modified habitat rather than on natural or critical habitat and demonstrate this effort through a project alternatives analysis conducted during the risks and impacts identification process;
- GN37. Performance Standard 6 requires that projects with significant biodiversity values in modified habitats minimise their impacts and implement mitigation and management measures as needed to conserve those values. Significant biodiversity values that might occur in modified habitat include species of conservation concern (for example, species that are threatened or otherwise identified as important by stakeholders) and remnant ecological features that persist in the modified landscape, especially those that perform important ecological functions. In some cases, significant biodiversity values may cause natural or critical habitat requirements to be applied, in which case they should be treated using the guidelines for those habitat designations;



- GN104. In many cases, invasive species will have already been established in the region in which the project is located. In these cases, the client has the responsibility to take measures to prevent the species from further spread into areas in which it has not already been established. For example, in the case of linear infrastructure, invasive weeds might be spread into forested habitats, especially if the forest canopy is not able to re-establish itself (due to maintenance of the right-of-way for operational purposes). This is exacerbated if opportunistic agricultural or logging activities further widen the right-of-way, thereby facilitating spread. In these cases, the client is expected to determine the severity of the threat and the mode of spread of that species. The situation should be monitored as part of the overall Environmental and Social Management System (ESMS), and the client should seek effective mitigation measures in coordination with local and national authorities;
- GN106. Performance Standard 6 defines ecosystem services as “the benefits that people, including businesses, obtain from ecosystems” (paragraph 2), which is in line with the definition provided by the Millennium Ecosystem Assessment (GN23). As described in paragraph 2 and footnote 1 of Performance Standard 6, ecosystem services are organized into four major categories:
  - Provisioning ecosystem services, include, among others, (i) agricultural products, seafood and game, wild foods, and ethnobotanical plants; (ii) water for drinking, irrigation, and industrial purposes; and (iii) forest areas, which provide the basis for many biopharmaceuticals, construction materials, and biomass for renewable energy;
  - Regulating ecosystem services, include, among others, (i) climate regulation and carbon;
  - Storage and sequestration; (ii) waste decomposition and detoxification; (iii) purification of water and air; (iv) control of pests, disease, and pollination; and (v) natural hazard mitigation;
  - Cultural services, include, among others, (i) spiritual and sacred sites; (ii) recreational purposes such as sport, hunting, fishing, and ecotourism; and (iii) scientific exploration and education; and
  - Supporting services, are the natural processes that maintain the other services, such as (i) nutrient capture and recycling, (ii) primary production, and (iii) pathways for genetic exchange.



## 6.1 Results and Conclusion

The table below lists the various habitat units as discussed in the biodiversity report with reference to the IFC habitat units mentioned above.

**Table 2: Habitat units classification based on the IFC PS6 standards.**

Habitat Unit	Description	Applicable IFC Habitat and applicable Criteria
<b>GRASSLAND HABITAT</b>	Habitat integrity has largely been diminished. The habitat is considered to be in a <b>fair ecological condition</b> , i.e., moderately modified, semi-natural and in which ecological function is maintained even though composition and structure have been compromised.	<b>Natural habitat</b> , i.e., areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.  <b>Additional Considerations:</b> GN9, GN36, as well as GN104 are applicable within this habitat unit.  <b>Extent of Habitat Unit (Natural Habitat Loss): 108 ha.</b>
<b>TRANSFORMED HABITAT</b>	<b>Anthropogenic Landscapes</b>  Habitat integrity has entirely been diminished. The habitat is in a <b>poor ecological condition</b> , i.e., severely, or irreversibly modified and in which ecological function has been compromised in addition to structure and composition of the habitat.	<b>Modified habitat</b> are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands.  <b>Additional Considerations:</b> GN36, GN104, are applicable within this habitat unit.
<b>FRESHWATER ECOSYSTEM</b>	Habitat integrity of the Freshwater ecosystems are considered to be intact and within a <b>good ecological condition</b> , i.e., habitat still natural with an ecological condition class in which composition, structure and function are still intact or largely intact.	<b>Natural habitat</b> , i.e., areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.  <b>Additional Considerations:</b> GN9, GN36, GN104 and GN106 are applicable within this habitat unit.  <b>Extent of Habitat Unit (Natural Habitat Loss): 13 ha.</b>
<b>IFC Habitat Unit Discussion</b>		
<b>GN9</b>	<p>No significant loss of natural or critical habitat associated with the Transformed Habitat, due to this habitat unit falling under the IFC's "Modified Habitat" classification.</p> <p>For the Grassland Habitat, which is considered "Natural Habitat", the proposed Tournée 2 Solar PV Park will impact on these habitats and thus GN9 is relevant to habitat unit. The impact is considered to be significant as per local definitions thereof (i.e., an impact that may have a notable effect on one or more aspects of the environment or may result in non-compliance with accepted environmental quality standards, thresholds, or targets (Integrated Environmental Management (IEM) series)).</p> <p>GN 9 states that the baseline should include field surveys over multiple seasons, to be undertaken by competent professionals and with the involvement of external experts, as necessary. However, based on Grassland Ecosystem Guidelines (SANBI, 2013), biodiversity surveys should be carried out during the summer months when most annuals and bulbs are flowering, and if applicable follow-up surveys should be carried out at more or less the same time of year.</p>	
<b>GN36</b>	The proposed layout areas have avoided some of the habitat identified as Natural (e.g., Freshwater Ecosystems and Grassland Habitat). Efforts are made to exclude the Freshwater	





Habitat Unit	Description	Applicable IFC Habitat and applicable Criteria
	Ecosystem habitat but was unable to avoid natural habitat such as the Grassland habitat. Large sections are, however, within Modified Habitat.	
GN104	All habitat units were associated with AIPs and will require a management plan to control spread of such species during the operation phase of the proposed Tournée 2 Solar PV Park.	
GN106	Ecosystem services are largely associated with the Freshwater Ecosystem, which is partially avoided in the proposed layout. See the Freshwater Scoping report for mitigation measure (i.e., to conserve the ecosystem functioning of the freshwater habitat) of remaining extent of the Freshwater Ecosystems excluded from the non-developable areas in the proposed layout of Tournée 2 Solar PV Park.	

## 7. POTENTIAL IMPACTS AND PROPOSED MANAGEMENT MEASURES

The below sections provide preliminary risks and potential impacts for the proposed project. It is important to keep in mind that the impact statements are not comprehensive, and a detailed impact assessment will follow as part of the EIA phase.

### 7.1. Description of potential preliminary impacts associated with the proposed infrastructure development.

**Table 3: Preliminary Impact Assessment considering the perceived impacts and mitigation surrounding the floral habitat diversity and SCC within the Tournée 2 Solar PV Park.**

<b>Impacts:</b>			
<ul style="list-style-type: none"> <li>➤ Vegetation clearing and construction activities will lead to habitat destruction and disturbance within the direct footprint area and will likely lead to the loss of floral communities, consequently impacting on the terrestrial biodiversity within the Tournée 2 Solar PV Park;</li> <li>➤ The Tournée 2 Solar PV Park is anticipated to host provincially protected floral species listed in the MNCA. As such, the proposed activities threaten potentially occurring floral SCC habitat and populations;</li> <li>➤ Changes in surface characteristics may lead to increased runoff and erosion resulting in a further loss of floral habitat in adjacent areas;</li> <li>➤ Degradation of the surrounding Freshwater Ecosystems within the Tournée 2 Solar PV Park will result in significant loss of floral habitat (specifically species reliant on wet environments), impacting upon species diversity and abundance;</li> <li>➤ Introduction of foreign material (e.g., soil) during construction activities may lead to the further introduction of alien invader species, impacting on the floral characteristics of the Tournée 2 Solar PV Park;</li> <li>➤ Failure to implement an alien floral control plan may result in widespread degradation or loss of indigenous flora within the Tournée 2 Solar PV Park and possibly in surrounding areas; and</li> <li>➤ Ineffective removal and control of alien invader species, and poor rehabilitation of exposed areas could lead to re-establishment of invasive species, impacting on floral community rehabilitation efforts.</li> </ul>			
	<b>Probability</b>	<b>Consequence</b>	<b>Significance</b>
<b>Floral Habitat and Diversity</b>	4	3	<b>High</b>
<b>Floral SCC</b>	3	2	<b>Medium</b>
<b>Mitigation:</b>			



- At all times, ensure that sound environmental management is in place during the planning phase;
- The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats must be excluded from the proposed activities. Development should be prioritised in habitats of decreased sensitivity;
- Access roads should be kept to existing roads so to reduce further fragmentation of existing natural habitat;
- The construction and operational footprints must be kept as small as possible, clearly demarcated, and prioritised in habitats of low sensitivity, in order to minimise impact on the surrounding environment;
- Informal fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed;
- In terms of the DFFE (2013) mitigation hierarchy, avoidance should be undertaken primarily to avoid high impacts to floral SCC. Following this, and if not completely possible to avoid impacts, a search and rescue should be undertaken prior to the vegetation clearing activities;
- Rescue efforts should also include a walkdown of the proposed footprint areas to detect and/or mark all (potentially) occurring floral SCC. This should be overseen by a suitably qualified specialist or nominated personnel in order to ensure that species loss during construction activities is kept to a minimum;
- Where floral SCC are located in the proposed footprint areas, the appropriate permits must be obtained from the relevant authorities before any further work can be conducted;
- Should any floral SCC species be found within the proposed development footprint, they must be legally relocated to suitable, similar habitat in close proximity to where they were removed from, but outside the disturbance footprint.
- Infrastructure design should be environmentally sound and all vehicles in a good working condition, and all possible precautions taken to prevent potential spills and /or leaks;
- No dumping of general or hazardous waste should take place. If any spills occur, they should be immediately cleaned up, and be disposed of at a registered waste facility;
- Special attention should be paid to AIP control within these areas; and
- Edge effects of all operational activities, such as erosion and alien plant species proliferation, which may affect adjacent natural vegetation, need to be strictly managed adjacent to the project footprint areas.

**Table 4: Impact Assessment considering the perceived impacts and mitigation surrounding the faunal habitat, diversity and SCC within the Tournée 2 Solar PV Park.**

<b>Impacts:</b>			
<ul style="list-style-type: none"> <li>➤ Vegetation clearing may result in the loss of faunal habitat, diversity and SCC within the directly impacted areas, whilst edge effects may lead to further declines of faunal SCC in the adjacent areas;</li> <li>➤ Alien plant proliferation will lead to changes in habitat structure and food resources, leading to a decline of habitat suitability for faunal species;</li> <li>➤ Permanent surface scarring may reduce favourable habitat for faunal species;</li> <li>➤ Increased risk of hunting/trapping of local faunal species; and</li> <li>➤ Potential for poor rehabilitation and monitoring of sensitive habitat, leading to declines in species diversity.</li> </ul>			
	<b>Probability</b>	<b>Consequence</b>	<b>Significance</b>
<b>Faunal Habitat and Diversity</b>	4	3	<b>High</b>
<b>Faunal SCC</b>	3	3	<b>Medium</b>
<b>Mitigation:</b>			
<ul style="list-style-type: none"> <li>➤ The design plans should take cognisance of sensitive habitats described during the EIA phase, in line with the DFFE mitigation hierarchy. As far as feasibly possible, sensitive habitats must be excluded from the proposed activities. Development should be prioritised in habitats of decreased sensitivity;</li> <li>➤ Access roads should be kept to existing roads so to reduce further fragmentation of existing natural habitat;</li> <li>➤ The construction and operational footprints must be kept as small as possible, clearly demarcated, and prioritised in habitats of low sensitivity, in order to minimise impact on the surrounding environment;</li> </ul>			



- Informal fires by construction personnel should be prohibited, and no uncontrolled fires whatsoever should be allowed;
- Special attention should be paid to AIP control within the project footprint and adjacent areas;
- Edge effects of all activities, such as erosion and alien plant species proliferation, which may affect adjacent natural vegetation, need to be strictly managed adjacent to the project footprint areas;
- Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC habitat outside of the proposed development footprint;
- Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract insectivores to the footprint area, notably bats and may increase bat collisions or electrocutions. Furthermore, increased lighting will impose upon the nights darkness altering invertebrate movement. Lights should be of a softer yellow, fluorescent design whilst bright LED and/or white lights should be avoided;
- Faunal habitat beyond the demarcated area should not be cleared or altered; and
- No collection or hunting of any fauna species is to be allowed by personnel, especially with regards to faunal SCC (if encountered and not part of a rescue/relocation plan).

Please note that the above list is not exhaustive. Additional impacts will need to be identified during a detailed impact assessment.





## 8. A PLAN OF STUDY FOR EIA PHASE

Specific outcomes in terms of the EIA phase report are presented in the points below:

- To identify and consider all sensitive habitats including Freshwater Ecosystems and/or any other special features;
- The terrestrial ecological assessment will focus on:
  - Conducting a SCC assessment, including potential for species to occur within the Tournée 2 Solar PV Park;
  - Providing floral and faunal inventories of species that were encountered on site;
  - Describing the spatial significance of the proposed infrastructure development with regards to surrounding natural areas;
  - Describing floral habitats, communities and ecological state of the proposed infrastructure development as is determined on site;
  - Identifying dominant floral and faunal species for each habitat type;
  - Focus will be given to identifying areas of severe alien and invader encroachment and listing Category 1, 2 and 3 species in terms of GN No. R.1020 Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated September 2020 as it relates to the NEMBA; and
  - Specific focus will also be given to establishing the presence of RDL and protected fauna and flora as listed under the IUCN, the MNCA (Schedule 11), the NFA, and the NEMBA: TOPS list of 2023);
- The reports produced will include a detailed impact assessment of all identified significant risks, including cumulative impacts on ecological assemblages in the region; and
- Recommendations on the management and mitigation measures (including opportunities and constraints) with regards to the construction and operation of the proposed activities, will be provided to manage and mitigate impacts on the terrestrial ecology of the area.

Please refer to Appendices B to D for the envisioned methods of assessment.



## 9. CONCLUSION

STS was appointed to conduct a biodiversity scoping report as part of the EIA and EA process for the proposed Tournée 2 Solar PV Park development.

Based on the preliminary desktop assessment, the Tournée 2 Solar PV Park is located within the Grassland Biome, within the Mesic Highveld Grassland Bioregion. According to the VEGMAP of South Africa (2018), the Tournée 2 Solar PV Park is located within the (VU) Soweto Highveld Grassland vegetation type (Gm 8). However, only sections of the Tournée 2 Solar PV Park are regarded as remaining Soweto Highveld Grassland vegetation type based on the NBA (2018) database, which was also confirmed by the RLE (2022) database. The Tournée 2 Solar PV Park is not located within 10 km of any IBAs or any protected areas.

According to the MBSP (2019), the majority of the Tournée 2 Solar PV Park are considered to be ONA and Heavily Modified, with only a very small section regarded as CBA in the lower western corner. The screening tool assigned the Tournée 2 Solar PV Park to have a **very high sensitivity** for the terrestrial biodiversity theme, for which the triggered sensitivity features for the very high sensitivity include a CBA 2, VU ecosystem, and focus areas for land-based protected areas expansion and South African Protected Areas. For the Plant Species theme, the screening tool identified the Tournée 2 Solar PV Park as a **medium sensitivity** area. However, the majority of the Tournée 2 Solar PV Park is considered to have a **low sensitivity** areas scattered within the Tournée 2 Solar PV Park. The triggered sensitive species include Sensitive Species 1261 (VU) and Sensitive species 691(VU). For the Animal Species theme, the Tournée 2 Solar PV Park is considered to have a **medium sensitivity** due to potential suitable habitat for several trigger species under the insecta, mammalian, and avifaunal classes.

From a terrestrial desktop assessment point of view, the Tournée 2 Solar PV Park is considered to range from moderate to high sensitivity. The full biodiversity assessment in the EIA phase will, however, confirm/negate these sensitivities as identified by the relevant desktop datasets based on the detailed field assessment. Section 4 provides preliminary impacts and management measures pertaining to the proposed development activities. It is the opinion of the specialist that the preliminary exclusion areas be amended to include the delineations from the Freshwater Scoping report, and associated buffers, to mitigate the impacts associated with sensitive habitats present within the Tournée 2 Solar PV Park.

More information will be provided during the EIA phase. Sensitive habitat types as well as detailed lists of floral and faunal SCC, or species protected under the MNCA or NEMBA:TOPS (2023) will be provided in the full biodiversity assessment reports. A comprehensive list of the



risks to the receiving floral and faunal environment will be identified, and additional, relevant mitigatory recommendations will be presented in line with the mitigation hierarchy, as advocated by the DFFE, in order to ensure informed decision making and improved sustainable development in the Tournée 2 Solar PV Park.

It is the opinion of the ecologists that this study provides the relevant information required in order to implement Integrated Environmental Management (IEM) and to ensure that the best long-term use of the ecological resources in the Tournée 2 Solar PV Park will be made in support of the principle of sustainable development.





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## APPENDIX A: Legislative Requirements

### THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of Section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socio-economic right and not an environmental right. However, read with Section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Water regulation in South Africa places a great emphasis on protecting the resource and on providing access to water for everyone.

### THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA)

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed and environmental authorisation obtained. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the anticipated impacts.

### THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA)

The objectives of this act are (within the framework of NEMA) to provide for:

- The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity;
- The use of indigenous biological resources in a sustainable manner;
- The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;
- To give effect to ratify international agreements relating to biodiversity which are binding to the Republic;
- To provide for cooperative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas are not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources.

Furthermore, a person may not carry out a restricted activity involving either:

- a) A specimen of a listed threatened or protected species;
- b) Specimens of an alien species; or
- c) A specimen of a listed invasive species without a permit.



## **GOVERNMENT NOTICE NUMBER R.1020: ALIEN AND INVASIVE SPECIES REGULATIONS, 2020 (IN GOVERNMENT GAZETTE 43735), INCLUDING GOVERNMENT NOTICE NUMBER 1003: ALIEN AND INVASIVE SPECIES LISTS, 2020 (IN GOVERNMENT GAZETTE 43726) AS IT RELATES TO THE NEMBA**

NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of alien and invasive species. This act in terms of alien and invasive species aims to:

- Prevent the unauthorized introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur,
- Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and
- Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Alien species are defined, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) as:

- (a) A species that is not an indigenous species; or
- (b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Categories according to NEMBA (Alien and Invasive Species Regulations, 2020):

- **Category 1a:** Invasive species that require compulsory control;
- **Category 1b:** Invasive species that require control by means of an invasive species management programme;
- **Category 2:** Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and
- **Category 3:** Ornamentally used plants that may no longer be planted.

## **NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, 2003 (ACT NO. 57 OF 2003) AS AMENDED<sup>6</sup> (NEMPAA)**

The objective of this act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection thereof.

<sup>6</sup> Amendments to the NEMPAA:

- National Environmental Management: Protected Areas Amendment Act 31 of 2004 – Gazette No. 27274, No. 131. Commencement date: 1 November 2005 [Proc. No. R. 58, Gazette No, 28123]
- National Environment Laws Amendment Act 14 of 2009 – Gazette No.32267, No. 617. Commencement date: 18 September 2009 [Proc. 65, Gazette No. 32580]
- National Environmental Management: Protected Areas Amendment Act 15 of 2009 – Gazette No. 32660, No. 748. Commencement date: 23 October 2009 – except for sections 1 and 8 [Proc. No. 69, Gazette No. 32660]
- Schedule 2 amended by Government Notice R236 in Government Gazette 36295 dated 27 March 2013. Commencement date: 1 April 2013 of sections 1 and 8 (relating to Schedule 2) of the National Environmental Management Protected Areas Amendment Act, 15 of 2009 [Proc. No. 7, Gazette No. 36296]
- National Environmental Management: Protected Areas Amendment Act 21 of 2014 - Government Notice 445 in Government Gazette 37710 dated 2 June 2014. Commencement date: 2 June 2014.
- Schedule 2 amendment by General Notice 2 of 2016 in Government Gazette 39728 dated 25 February 2016. Commencement date: 25 February 2016.





## **THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (ACT NO. 43 OF 1983) (CARA)**

Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Removal of AIP and weed species should take place throughout the construction and operation, phases in line with an approved AIP Management Plan.

## **THE MPUMALANGA NATURE CONSERVATION ACT, 1998 (ACT NO. 10 OF 1998) (MNCA)**

The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA) provides for the protection of indigenous plants. Subject to the provisions of this Act, no person shall:

- Pick, be in possession of, sell, purchase, donate, receive as a gift, import into, export, or remove from the Province, or convey:
  - A specially protected plant; or
  - A protected plant.
- Pick any indigenous plant:
  - On a public road;
  - On land next to a public road within 100 m measured from the centre of the road;
  - Within an area bordering any natural watercourse, whether wet or dry, up to and within 50 m from the high watermark on either side of the natural watercourse; or
  - In a Provincial Park, a site of Ecological Importance or a Protected Natural Environment.

The below schedules were applicable for the floral and faunal assessments (Part B and C):

- Schedule 1: Specifically Protected Game (Section 4 (1) (a));
- Schedule 2: Protected Game (Section 4 (1) (b));
- Schedule 4: Protected Wild Animals (Section 4 (1) (d));
- Schedule 7: Invertebrates (Section 35 (1));
- Schedule 11: Protected Plants (Section 69 (1) (a)); and
- Schedule 12: Specifically Protected Plants (Section 69 (1) (b)).



## APPENDIX B: Floral Method of Assessment during EIA phase

### ***Floral Species of Conservational Concern Assessment***

Prior to the site visit, a record of floral SCC and their habitat requirements was developed for the Tournée 2 Solar PV Park, which includes consulting the National Web-based Environmental Screening Tool. Because not all SCC have been included in the Screening Tool layers (e.g. NT and DD taxa), it remains important for the specialist to be on the lookout for additional SCC. For this study, two primary sources were consulted and are described below.

#### **The National Web-Based Environmental Screening Tool**

The Screening Tool was accessed to obtain a list of potentially occurring species of conservation concern for the Tournée 2 Solar PV Park. Each of the themes in the Screening Tool consists of theme-specific spatial datasets which have been assigned a sensitivity level namely, “low”, “medium”, “high” and “very high” sensitivity. The four levels of sensitivity are derived and identified in different ways, e.g. for **confirmed** areas of occupied habitat for SCC a Very High and High Sensitivity is assigned and for areas of suitable habitat where SCC may occur based on spatial models only, a Medium Sensitivity is assigned. The different sensitivity ratings pertaining to the Plant [and Animal] Protocols are described below<sup>7</sup>:

- **Very High:** Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km<sup>2</sup> are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under Critically Endangered (CR), Endangered (EN), or Vulnerable (VU) D criteria of the IUCN or species listed as Critically/Extremely Rare under South Africa’s National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitat has been manually mapped at a fine scale.
- **High:** Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level. Spatial polygons of suitable habitat have been produced for each species by intersecting recently collected occurrence records (those collected since the year 2000) that have a spatial confidence level of less than 250 m with segments of remaining natural habitat.
- **Medium:** Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. Two types of spatial models have been included. The first is a simple rule-based habitat suitability model where habitat attributes such as vegetation type and altitude are selected for all areas where a species has been recorded to occur. The second is a species distribution model which uses species occurrence records combined with multiple environmental variables to quantify and predict areas of suitable habitat. The models provide a probability-based distribution indicating a continuous range of habitat suitability across areas that have not been previously surveyed. A probability threshold of 75% for suitable habitat has been used to convert the modelled probability surface and reduce it into a single spatial area which defines areas that fall within the medium sensitivity level.
- **Low:** Areas where no SCC are known or expected to occur.

#### **BRAHMS Online Website**

The Botanical Database of Southern Africa (BODATSA) is accessed to obtain plant names and floristic details (<http://posa.sanbi.org/>) for species of conservation concern within a selected boundary;

- This website provides access to South African plant names (taxa), specimens (herbarium sheets) and observations of plants made in the field (botanical records). Data is obtained from the Botanical Database of Southern Africa (BODATSA), which contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).

<sup>7</sup> More details on the use of the Screening Tool for Species of Conservation Concern can be found in the below resources:

- South African National Biodiversity Institute (SANBI). 2020. Draft Species Environmental Assessment Guideline. Guidelines for the implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for environmental impact assessments in South Africa. South African National Biodiversity Institute, Pretoria. Version 1.0.
- The National Web based Environmental Screening Tool website:  
<https://screening.environment.gov.za/screeningtool/#/pages/welcome>



- Information on habitat requirements etc. is obtained from the SANBI Red List of South African Plants website (<http://redlist.sanbi.org/>).
- Typically, data is extracted for the Quarter Degree Square (QDS) in which the Tournée 2 Solar PV Park is situated but where it is deemed appropriate, a larger area can be included.

Throughout the floral assessment, special attention was paid to the identification of any of these SCC as well as the identification of suitable habitat that could potentially support these species.

The Probability of Occurrence (POC) for each floral SCC is described:

- **“Confirmed”**: if observed during the survey;
- **“High”**: if within the species’ known distribution range and suitable habitat is available;
- **“Medium”**: if either within the known distribution range of the species or if suitable habitat is present; or
- **“Low”**: if the habitat is not suitable and falls outside the distribution range of the species.

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

## Vegetation Surveys

When planning the timing of a floristic survey, it is important to remember that the primary objective is not an exhaustive species list but rather to ensure that sufficient data are collected to describe all the vegetation communities present in the area of interest, to optimise the detection of SCC and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

The vegetation survey incorporates the subjective (or stratified) sampling method. Subjective sampling is a sampling technique in which the specialist relies on his or her own professional experience when choosing sample sites within the Tournée 2 Solar PV Park . This allows representative recordings of floral communities and optimal detection of SCC. Subjective sampling is used to consider different areas (or habitat units) which are identified within the main body of a habitat/Tournée 2 Solar PV Park .

One of the problems with random sampling, another popular sampling method, is that random samples may not cover all areas of a Tournée 2 Solar PV Park equally and thus increase the potential to miss floral SCC. Random sampling methods also tend to require more time in the field to locate the amount of SCC that can be detected using subjective sampling methods - In the context of an EIA where time constraints are often restrictive, priority needs to be given to collecting data in the shortest time possible without compromising the efficiency of locating SCC (SANBI, 2020).

## Floral Habitat Sensitivity

The floral habitat sensitivity of each habitat unit was determined by calculating the mean of five different parameters which influence floral communities and provide an indication of the overall floristic ecological integrity, importance, and sensitivity of the habitat unit. Each of the following parameters are subjectively rated on a scale of 1 to 5 (1 = lowest and 5 = highest):

- **Floral SCC**: The confirmed presence or potential for floral SCC or any other significant species, such as endemics, to occur within the habitat unit;
- **Unique Landscapes**: The presence of unique landscapes or the presence of an ecologically intact habitat unit in a transformed region;
- **Conservation Status**: The conservation status of the ecosystem or vegetation type in which the habitat unit is situated based on local, regional and national databases. Whether the habitat is representative of a Critical Biodiversity Area or forms part of an Ecological Support Area is also taken into consideration;
- **Floral Diversity**: The recorded floral diversity compared to a suitable reference condition such as surrounding natural areas or available floristic databases; and
- **Habitat Integrity**: The degree to which the habitat unit is transformed based on observed disturbances which may affect habitat integrity.

Each of these values contribute equally to the mean score, which determines the floral habitat sensitivity class in which each habitat unit falls. A conservation and land-use objective is also assigned to each sensitivity class which aims to guide the responsible and sustainable utilization of the habitat unit in question. To present the results use is made of spider diagrams to depict the significance of each aspect



of floral ecology for each vegetation type. The different classes and land-use objectives are presented in the table below:

**Table B1: Floral habitat sensitivity rankings and associated land-use objectives.**

Score	Rating significance	Conservation objective
1 < 1.5	Low	Optimise development potential.
≥1.5 <2.5	Moderately low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.
≥2.5 <3.5	Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds while optimizing development potential.
≥3.5<4.5	Moderately high	Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.
≥4.5 ≤5.0	High	Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.





## APPENDIX C: Faunal Method of Assessment during the EIA phase

It is important to note that due to the nature and habits of fauna, varied stages of life cycles, seasonal and temporal fluctuations along with other external factors, it is unlikely that all faunal species will have been recorded during the site assessment. The presence of anthropogenic activities adjacent to the sites will have an impact on faunal behaviour and in turn the rate of observations.

### ***Mammals***

Mammal species were recorded during the field assessment with the use of visual identification, spoor, calls, dung and other notable field signs. Sherman traps were used to capture small rodents and camera traps were employed to increase observation rates of cryptic, nocturnal species. Specific attention was paid to mammal SCC as listed by the International Union for the Conservation of Nature (IUCN), the North West Province and NEMBA.

### ***Reptiles***

Reptiles were identified during the field survey. Suitable applicable habitat areas (rocky outcrops and fallen dead trees) were inspected, and all reptiles encountered were identified. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which reptile species are likely to occur on the Tournée 2 Solar PV Park . Specific attention was given to reptile SCC listed on a regional and national level, as well as those identified by the IUCN.

### ***Amphibians***

Identifying amphibian species is done by the use of direct visual identification along with call identification technique. Amphibian species flourish in and around wetland, riparian and moist grassland areas. It is unlikely that all amphibian species will have been recorded during the site assessment, due to their cryptic nature and habits, varied stages of life cycles and seasonal and temporal fluctuations within the environment. The data gathered during the assessment along with the habitat analysis provided an accurate indication of which amphibian species are likely to occur within the Tournée 2 Solar PV Park as well as the surrounding area. Specific attention was given to amphibian SCC listed on a regional and national level, as well as those identified by the IUCN.

### ***Invertebrates***

Whilst conducting transects through the Tournée 2 Solar PV Park , all insect species visually observed were identified, and where possible, photographs taken. It must be noted, however that due to the cryptic nature and habits of insects, varied stages of life cycles and seasonal and temporal fluctuations within the environment, it is unlikely that all insect species will have been recorded during the site assessment period. Nevertheless, the data gathered during the assessment along with the habitat analysis provided an accurate indication of which species are likely to occur in the Tournée 2 Solar PV Park at the time of the survey. Specific attention was given to insect SCC listed on a regional and national level, as well as those identified by the IUCN.



## Arachnids

Suitable applicable habitat areas (rocky outcrops, sandy areas and fallen dead trees) where spiders and scorpions are likely to reside were searched. Rocks were overturned and inspected for signs of these species. Specific attention was paid to searching for Mygalomorphae arachnids (Trapdoor and Baboon spiders) as well as potential SCC scorpions.

## Faunal Species of Conservation Concern Assessment

The Probability of Occurrence (POC) for each faunal SCC was determined using the following four parameters:

- Species distribution;
- Habitat availability;
- Food availability; and
- Habitat disturbance.

The Probability of Occurrence (POC) for each faunal SCC is described:

- **“Confirmed”**: if observed during the survey;
- **“High”**: if within the species’ known distribution range and suitable habitat is available;
- **“Medium”**: if either within the known distribution range of the species or if suitable habitat is present; or
- **“Low”**: if the habitat is not suitable and falls outside the distribution range of the species.

The accuracy of the POC is based on the available knowledge about the species in question, with many of the species lacking in-depth habitat research.

## Faunal Habitat Sensitivity

The sensitivity of the Tournée 2 Solar PV Park for each faunal class (i.e., mammals, birds, reptiles, amphibians and invertebrates) was determined by calculating the mean of five different parameters which influence each faunal class and provide an indication of the overall faunal ecological integrity, importance and sensitivity of the Tournée 2 Solar PV Park for each class. Each of the following parameters are subjectively rated on a scale of 1 to 5 (1 = lowest and 5 = highest):

- **Faunal SCC**: The confirmed presence or potential for faunal SCC or any other significant species, such as endemics, to occur within the habitat unit;
- **Habitat Availability**: The presence of suitable habitat for each class;
- **Food Availability**: The availability of food within the Tournée 2 Solar PV Park for each faunal class;
- **Faunal Diversity**: The recorded faunal diversity compared to a suitable reference condition such as surrounding natural areas or available faunal databases; and
- **Habitat Integrity**: The degree to which the habitat is transformed based on observed disturbances which may affect habitat integrity.

Each of these values contribute equally to the mean score, which determines the suitability and sensitivity of the Tournée 2 Solar PV Park for each faunal class. A conservation and land-use objective is also assigned to each sensitivity class which aims to guide the responsible and sustainable utilization of the Tournée 2 Solar PV Park in relation to each faunal class. The different classes and land-use objectives are presented in the table below:



**Table C1: Faunal habitat sensitivity rankings and associated land-use objectives.**

Score	Rating significance	Conservation objective
1.0 < 1.5	Low	Optimise development potential.
≥1.5 <2.5	Moderately low	Optimise development potential while improving biodiversity integrity of surrounding natural habitat and managing edge effects.
≥2.5 <3.5	Intermediate	Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.
≥3.5<4.5	Moderately high	Preserve and enhance the biodiversity of the habitat unit, limit development and disturbance.
≥4.5 ≤ 5.0	High	Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.



## APPENDIX D: Impact Assessment Methodology

The methods implemented within this report were provided by the proponent. The impact methodology is as follows:

### 1. SCOPING PHASE

#### **Reporting Requirements**

- Project Description
- Legislative Context (as applicable)
- Assumptions and limitations
- Description of Baseline Environment
- Site Verification Assessment (including sensitivity mapping) (as applicable)
- Identification and high-level screening of impacts
- Plan of Study for EIA

#### **High-Level Screening of Impacts and Mitigation**

Appendix 2 of GNR 982, as amended, requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and, consequence (Table 0-3), where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in **Error! Reference source not found.** and Table 0-2 respectively.

**Table D1: Probability Scores and Descriptors**

SCORE	DESCRIPTOR
4	<b>Definite:</b> The impact will occur regardless of any prevention measures
3	<b>Highly Probable:</b> It is most likely that the impact will occur
2	<b>Probable:</b> There is a good possibility that the impact will occur
1	<b>Improbable:</b> The possibility of the impact occurring is very low

**Table D2: Consequence Score Descriptions**

SCORE	NEGATIVE	POSITIVE
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.





2	Moderately severe: A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

**Table D3: Significance Screening Tool**

		CONSEQUENCE SCALE			
PROBABILITY SCALE		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (**Error! Reference source not found.**) has been applied according to the nature and significance of the identified impacts.

**Table D4: Impact Significance Colour Reference System to Indicate the Nature of the Impact**

NEGATIVE IMPACTS (-VE)	POSITIVE IMPACTS (+VE)
Negligible	Negligible
Very Low	Very Low
Low	Low
Medium	Medium
High	High



## 2. EIA PHASE

### Reporting Requirements

- Project Description
- Legislative Context (as applicable)
- Assumptions and limitations
- Description of methodology (as required)
- Update and/or confirmation of Baseline Environment – including update and / or confirmation of sensitivity mapping
- Identification and description of Impacts
- Full impact assessment (including Cumulative)
- Mitigation measures
- Impact Statement

Ensure that all reports fulfil the requirements of the relevant Protocols.

### Assessment of Impacts and Mitigation

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct<sup>8</sup>, indirect<sup>9</sup>, secondary<sup>10</sup> as well as cumulative<sup>11</sup> impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e. residual impact). The significance of environmental aspects is determined and ranked by considering the criteria<sup>12</sup> presented in Error! Reference source not found..

**Table D5: Impact Assessment Criteria and Scoring System**

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
<b>Impact Magnitude (M)</b> The degree of alteration of the affected environmental receptor	Very low: No impact on processes	Low: Slight impact on processes	Medium: Processes continue but in a modified way	High: Processes temporarily cease	Very High: Permanent cessation of processes
<b>Impact Extent (E)</b> The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
<b>Impact Reversibility (R)</b> The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action

<sup>8</sup> Impacts that arise directly from activities that form an integral part of the Project.

<sup>9</sup> Impacts that arise indirectly from activities not explicitly forming part of the Project.

<sup>10</sup> Secondary or induced impacts caused by a change in the Project environment.

<sup>11</sup> Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.

<sup>12</sup> The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.



CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
<b>Impact Duration (D)</b> The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
<b>Probability of Occurrence (P)</b> The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
<b>Significance (S)</b> is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				
IMPACT SIGNIFICANCE RATING					
<b>Total Score</b>	<b>4 to 15</b>	<b>16 to 30</b>	<b>31 to 60</b>	<b>61 to 80</b>	<b>81 to 100</b>
<b>Environmental Significance Rating (Negative (-))</b>	Very low	Low	Moderate	High	Very High
<b>Environmental Significance Rating (Positive (+))</b>	Very low	Low	Moderate	High	Very High

### Impact Mitigation

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development’s actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

The mitigation sequence/hierarchy is shown in Error! Reference source not found. below.



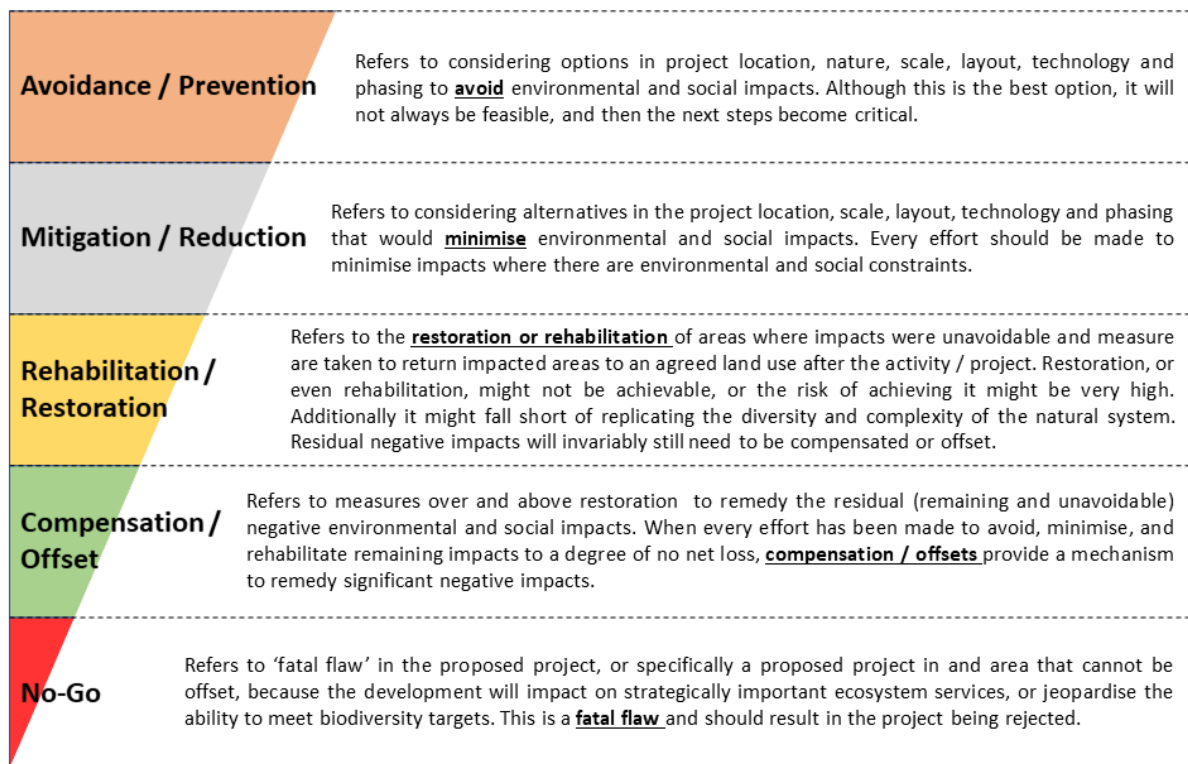


Figure D 13: Mitigation Sequence/Hierarchy





## APPENDIX E: Vegetation Type

### Soweto Highveld Grassland (GM8)



**Figure D1: Gm 8 Soweto Highveld Grassland:** Typical mesic highveld grassland with *Themeda triandra* and several *Eragrostis* species still found in some parts of the southern Gauteng in natural condition (page 397 Mucina & Rutherford 2006).

**Table D1: Floristic species of the Soweto Highveld Grassland (Mucina & Rutherford, 2006).**

Plant Community	Species
<b>Dominant and typical floristic species</b>	
<b>Woody Layer</b>	
<b>Low Shrubs</b>	<i>Anthospermum hispidulum</i> , <i>A. rigidum</i> subsp. <i>pumilum</i> , <i>Berkheya annectens</i> , <i>Felicia muricata</i> , <i>Ziziphus zeyheriana</i> .
<b>Forb layer</b>	
<b>Herbaceous climber</b>	<i>Rhynchosia totta</i> .
<b>Herbs</b>	<i>Hermannia depressa</i> (d), <i>Acalypha angustata</i> , <i>Berkheya setifera</i> , <i>Dicoma anomala</i> , <i>Euryops gilfillanii</i> , <i>Geigeria aspera</i> var. <i>aspera</i> , <i>Graderia subintegra</i> , <i>Haplocarpha scaposa</i> , <i>Helichrysum miconiifolium</i> , <i>H. nudifolium</i> var. <i>nudifolium</i> , <i>H. rugulosum</i> , <i>Hibiscus pusillus</i> , <i>Justicia anagalloides</i> , <i>Lippia scaberrima</i> , <i>Rhynchosia effusa</i> , <i>Schistostephium crataegifolium</i> , <i>Selago densiflora</i> , <i>Senecio coronatus</i> , <i>Hilliardiella elaeagnoides</i> , <i>Wahlenbergia undulata</i> .
<b>Geophytic Herbs</b>	<i>Haemanthus humilis</i> subsp. <i>hirsutus</i> , <i>H. montanus</i> .
<b>Graminoid layer</b>	
<b>Graminoids</b>	<i>Andropogon appendiculatus</i> (d), <i>Brachiaria serrata</i> (d), <i>Cymbopogon pospischilii</i> (d), <i>Cynodon dactylon</i> (d), <i>Elionurus muticus</i> (d), <i>Eragrostis capensis</i> (d), <i>E. chloromelas</i> (d), <i>E. curvula</i> (d), <i>E. plana</i> (d), <i>E. planiculmis</i> (d), <i>E. racemosa</i> (d), <i>Heteropogon contortus</i> (d), <i>Hyparrhenia hirta</i> (d), <i>Setaria nigrirostris</i> (d), <i>S. sphacelata</i> (d), <i>Themeda triandra</i> (d), <i>Tristachya leucothrix</i> (d), <i>Andropogon schirensis</i> , <i>Aristida adscensionis</i> , <i>A. bipartita</i> , <i>A. congesta</i> , <i>A. junciformis</i> subsp. <i>galpinii</i> , <i>Cymbopogon caesius</i> , <i>Digitaria diagonalis</i> , <i>Diheteropogon amplexens</i> , <i>Eragrostis micrantha</i> , <i>E. superba</i> , <i>Harpochloa falx</i> , <i>Microchloa caffra</i> , <i>Paspalum dilatatum</i> .



## APPENDIX F: SITE VERIFICATION

### ANIMAL, PLANT, AND TERRESTRIAL BIODIVERSITY SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED TOURNÉE 2 SOLAR PV PARK, NEAR THUTHUKANI, MPUMULNGA PROVINCE.

#### Introduction

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed by Red Rocket (Pty) Ltd to conduct a biodiversity scoping assessment as part of the Environmental Impact Assessment (EIA) and Environmental Authorisation (EA) process for the proposed Tournée 2 Solar Photovoltaic (PV) Parks near Thuthukani, Mpumalanga Province.

The closest town, Thuthukani located within the Lekwa Local Municipality and Gert Sibande District Municipality, is located approximately 10.5 km west of the proposed Tournée 2 Solar PV Park area. The Tournée 2 Solar PV Park is located adjacent to the Tutuka Power Station Ashing facility.

This document serves as the Animal, Plant, and Terrestrial Biodiversity Site Sensitivity Verification Report for the proposed Tournée 2 Solar PV Park. The proposed Tournée 2 Solar PV Park requires environmental authorisation in terms of the NEMA EIA Regulations (2014), as amended and a Water Use Licence (WUL).

#### Tournée 2 Solar PV Park

Tournée 2 Solar PV Park will consist of 150 megawatt (MW) PV solar energy facilities (PVSEF) within a total area of approximately 505.2 hectares (ha), of which 297 ha is considered buildable area. Total footprint of the Independent Power Producer (IPP) site substation and battery energy storage system (BESS) will be up to 4.5 ha in extent (3 ha for the BESS and 1.5 ha for the IPP portion of the substation). The substation will consist of a high voltage substation yard to allow for multiple (up to) 132 kV feeder bays and transformers, control building, telecommunication infrastructure, access roads, etc. The associated BESS storage capacity will be up to 150 MW/600 megawatt-hour (MWh) with up to four hours of storage.

It is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate, or Lithium Nickel Manganese Cobalt oxides will be considered as the preferred battery technology. The main components of the BESS include the batteries, power conversion system and transformer which will all be stored in various rows of containers.

The Operations and Maintenance (O&M) building footprint is expected to be 1 500m<sup>2</sup> (including stores and workshop). Internal roads of the Tournée 2 Solar PV Park will be 4m to 5m in width and approximately 8 km in length. During the construction phase, the construction camp and laydown area will include a typical construction camp area of 5000 m<sup>2</sup>, a typical laydown area of 20000 m<sup>2</sup> and septic tanks and portable toilets.

Tournée 2 Solar PV Park is on the remaining portion of Portion 3 of the farm DWARS-IN-DE-WEG 350 (extent in ha 344.1), and Portion 6 of the farm DWARS-IN-DE-WEG 350 (extent in a 161.1). The Tournée 2 Solar PV Park is surrounded by various major roadways including the R38, which is located approximately 5 km south of the Tournée 2 Solar PV Park and the R38 located 1.5 km West of the Tournée 2 Solar PV Park.





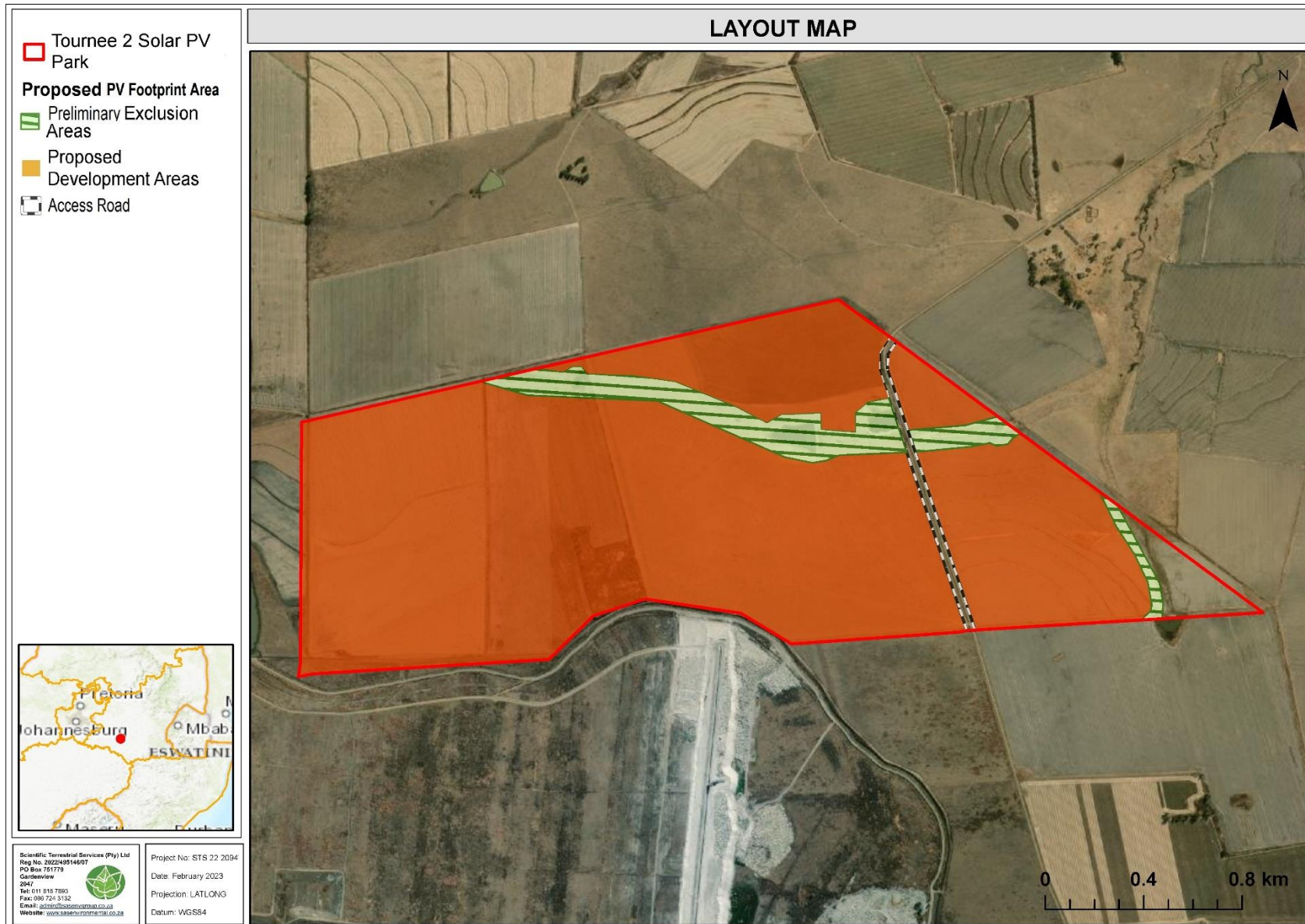


Figure F1: Digital satellite image depicting the location of the proposed Tournée 2 Solar PV Park in relation to the surrounding area.



## Site Verification Methodology

This Animal, Plant, and Terrestrial Biodiversity site sensitivity verification report relates to a Screening Tool Report completed for the site in March 2023. A site visit was conducted by the specialist to inform the specialist reports required for the proposed project.

## Animal, Plant, and Terrestrial Biodiversity Site Verification

The table below provides information regarding the outcome of the Screening tool in terms of the Animal, Plant, and Terrestrial Biodiversity theme sensitivities associated with the proposed project as well as a brief summary of the outcome of the terrestrial biodiversity specialist report in response.

**Table F1: Terrestrial Biodiversity theme sensitivity analysis for the proposed project.**

Environmental Theme	Applicable Protocol	Response
<p><b>Animal Species Theme</b></p> <p><u>Sensitivity Rating:</u></p> <p>For the Animal Species theme, the Tournée 2 Solar PV Park is considered to have a <b>medium sensitivity</b> due to potential suitable habitat for the following trigger species: Aves: <i>Tyto capensis</i> (African Grass Owl; VU) and <i>Eupodotis senegalensis</i> (White Bellied Korhaan; VU). Insecta: <i>Lepidochrysops procera</i> (Potchefstroom Blue; Rare) and Mammalia: <i>Crociodura maquassiensis</i> (Maquassie Musk Shrew; VU).</p> <p><u>Requirement:</u></p> <p>Terrestrial Animal Species Specialist Assessment</p> <p><u>Ground-truthed Sensitivity:</u></p> <p>The medium and low sensitivity for the Animal Species Theme for the Tournée 2 Solar PV Park for the Grassland and Freshwater habitat is supported for Mammal, Herpetofauna and invertebrate species.</p>	<p>Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations:</p> <ul style="list-style-type: none"> <li>➤ GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species as published in Government Gazette 43855 dated 30 October 2020</li> </ul>	<p>A Faunal Species Specialist Assessment was conducted by Scientific Terrestrial Services (STS, 2023). During the initial site visit it was determined that large portions of the site had previously been transformed or degraded; however, natural (untransformed) vegetation is still present. However, based on the lack of suitable habitat for the triggered insect and mammal species present within the untransformed habitat units the sensitivity provided by the Screening tool is disputed.</p> <p>The detailed Faunal Species Specialist Assessment report outlines the faunal habitat and diversity within Tournée 2 Solar PV Park and provides a motivation for the sensitivities determined and their alignment with the outcomes of the screening tool.</p>
<p><b>Plant Species Theme</b></p> <p><u>Sensitivity Rating:</u></p> <p>For the Plant Species theme, the screening tool identified the Tournée 2 Solar PV Park as a <b>medium sensitivity</b> area. However, the majority of the Tournée 2 Solar PV Park is considered to have a <b>low sensitivity</b> with three (3) portions of medium sensitivity areas scattered within the Tournée 2 Solar PV Park. The sensitivity of the Tournée 2 Solar PV Park is due to the potential presence of habitat for the following</p>	<p>Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations:</p> <ul style="list-style-type: none"> <li>➤ GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species as published in Government Gazette 43855 dated 30 October 2020</li> </ul>	<p>A Terrestrial Plant Species Specialist Assessment was conducted by Scientific Terrestrial Services (STS, 2023). During the site visit it was determined that most of the site is in a degraded state (specifically the Transformed Habitat); however, natural (untransformed) vegetation was present in the form of Grassland Habitat and Freshwater Ecosystems. However, based on the lack of suitable habitat for the triggered floral species present within the untransformed habitat units the sensitivity provided by the Screening tool is disputed.</p>





Environmental Theme	Applicable Protocol	Response
<p>trigger species: Sensitive species 1252 (VU) and Sensitive species 691(VU).</p> <p><u>Requirement:</u> Terrestrial Plant Species Specialist Assessment Report</p> <p><u>Ground-truthed Sensitivity:</u> The medium sensitivity for the Plant Species Theme for the Tournée 2 Solar PV Park is disputed.</p>		<p>The detailed Terrestrial Plant Species Specialist Assessment report will outline the habitat and conditions within Tournée 2 Solar PV Park and provides a clear motivation for disputing the medium sensitivity outcome of the screening tool.</p>
<p><b>Terrestrial Biodiversity Theme</b></p> <p><u>Sensitivity Rating:</u> The Terrestrial Sensitivity for the entire Tournée 2 Solar PV Park is considered to be a <b>very high</b>. The trigger features include <b>CBA 2</b> and a <b>VU</b> ecosystem.</p> <p><u>Requirement:</u> Terrestrial Biodiversity Specialist Assessment</p> <p><u>Ground-truthed Sensitivity:</u> The very high sensitivity was not confirmed for the entire Tournée 2 Solar PV Park development area but was confirmed for the Freshwater Ecosystem habitat.</p>	<p>Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE’s national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations:</p> <ul style="list-style-type: none"> <li>➤ GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020</li> </ul>	<p>A Terrestrial Biodiversity Specialist Assessment was conducted by Scientific Terrestrial Services (STS, 2023). During the site visit it was determined that several historic and current pressures on floral habitat and communities were present; however, some sections of seemingly intact vegetation and functionality remained. As such, a detailed assessment of all terrestrial biodiversity aspects was required to support and/or guide the authorisation process required in terms of National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).</p> <p>The detailed Terrestrial Biodiversity Specialist Assessment report outlines the habitat and ecological drivers (or lack thereof) within Tournée 2 Solar PV Park and provide clear motivations for disputing the very high sensitivity outcome of the screening tool for the majority of the Tournée 2 Solar PV Park development area.</p>



## APPENDIX G: Specialist Information

### 1. (a) (i) Details of the specialist who prepared the report

Charne Gouws	Msc Plant Science (Plant Science) (University of Pretoria)
Chris Hooton	BTech Nature Conservation (Tshwane University of Technology)
Christien Steyn	MSc Plant Science (University of Pretoria)
Hennie de Beer	National Diploma Nature Conservation (Tshwane University of Technology)
Nelanie Cloete	MSc Environmental Management (University of Johannesburg)

### 1. (A). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

Company of Specialist:	Scientific Terrestrial Services
Postal address:	PO. Box 751779, Gardenview
Postal code:	2047
Telephone:	011 616 7893
	Fax: 086 724 3132
Name	Charne Gouws
E-mail:	<a href="mailto:charne@sasenvgroup.co.za">charne@sasenvgroup.co.za</a>
Qualifications	MSc (Plant Science) (University of Pretoria) BSc (Hons) Plant Science (University of Pretoria) BSc (Environmental Sciences) (University of Pretoria)
Registration / Associations	SANAP (South African National Antarctic Programme) Golden Key Honorary Society Member of the Botanical Society of South Africa (BotSoc)
Name / Contact person:	Chris Hooton
E-mail:	<a href="mailto:chris@sasenvgroup.co.za">chris@sasenvgroup.co.za</a>
Qualifications	BTech Nature Conservation (Tshwane University of Technology) National Diploma Nature Conservation (Tshwane University of Technology)
Name	Christien Steyn
E-mail:	<a href="mailto:christien@sasenvgroup.co.za">christien@sasenvgroup.co.za</a>
Qualifications	MSc (Plant Science) (University of Pretoria) BSc (Hons) Plant Science (University of Pretoria) BSc (Environmental Sciences) (University of Pretoria)
Registration / Associations	Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 127823/21) Member of the Botanical Society of South Africa (BotSoc) Member of the Grassland Society of South Africa (GSSA) Member of the Land Rehabilitation Society of Southern Africa (LARSSA) Member of the South African Association of Botanists (SAAB) Member of the South African Wildlife Management Association (SAWMA)
Name / Contact person:	Hennie de Beer
E-mail:	<a href="mailto:hennie@sasenvgroup.co.za">hennie@sasenvgroup.co.za</a>
Qualifications	National Diploma Nature Conservation (Tshwane University of Technology)
Name	Nelanie Cloete
E-mail:	<a href="mailto:nelanie@sasenvgroup.co.za">nelanie@sasenvgroup.co.za</a>
Qualifications	MSc Environmental Management (University of Johannesburg) MSc Botany (University of Johannesburg) BSc (Hons) Botany (University of Johannesburg) BSc (Botany and Zoology) (Rand Afrikaans University)
Registration / Associations	Certificate – Department of Environmental Science in Legal context of Environmental Management, Compliance and Enforcement (UNISA) Introduction to Project Management - Online course by the University of Adelaide Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs Environmental legal compliance, Monitoring and Auditing



**1. (b) a declaration that the specialist is independent in a form as may be specified by the competent authority**

I, Charne Gouws, declare that -

- I act as the **independent specialist** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that June compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or June have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct.



-----  
Specialist Signature



I, Christopher Hooton, declare that -

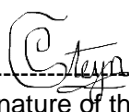
- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct.



-----  
Specialist Signature

I, Christien Steyn, declare that -

- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct



-----  
Signature of the Specialist





I, Hennie de Beer, declare that -

- I act as the **independent specialist** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct



-----  
Signature of the Specialist

I, Nelanie Cloete, declare that -

- I act as the **independent specialist (reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct



-----  
Signature of the Specialist





## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF CHARNE GOUWS

#### PERSONAL DETAILS

Position in Company	Floral Ecologist
Joined SAS Environmental Group of Companies	2022

#### MEMBERSHIP IN PROFESSIONAL SOCIETIES

SANAP (South African National Antarctic Programme)  
Golden Key Honorary Society  
Member of the Botanical Society of South Africa (BotSoc)

#### EDUCATION

##### Qualifications

MSc Plant Science (University of Pretoria)	2021
BSc (Hons) Plant Science (Invasion Biology) (University of Pretoria)	2018
BSc Environmental Science (University of Pretoria)	2017

##### Short courses and Training

- Advanced Grass Identification Course (2019)
- CREW Tree Identification Course (2019)
- ISO 140001 Environmental Management Course (2020)
- Ecological Practices and Theory Short Course (2020)

#### AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, Limpopo, KwaZulu-Natal, Northern Cape, North West and Eastern Cape

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- Floral Assessments
- Desktop Studies, Mapping and Background Information Research
- Floral Marking
- Alien Management Plans





## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF **CHRISTOPHER HOOTON**

#### PERSONAL DETAILS

Position in Company	Senior Scientist, Member Biodiversity Specialist
Joined SAS Environmental Group of Companies	2013

#### EDUCATION

##### Qualifications

BTech Nature Conservation (Tshwane University of Technology)	2013
National Diploma Nature Conservation (Tshwane University of Technology)	2008

#### AREAS OF WORK EXPERIENCE

**South Africa** – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Eastern Cape, Western Cape, Northern Cape, Free State

**Africa** - Zimbabwe, Sierra Leone, Zambia

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- Floral Assessments
- Faunal Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

##### Freshwater Assessments

- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning





## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF CHRISTIEN STEYN

#### PERSONAL DETAILS

Position in Company	Floral Ecologist
Joined SAS Environmental Group of Companies	2018

#### MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 127823/21)

Member of the Botanical Society of South Africa (BotSoc)

Member of the Grassland Society of South Africa (GSSA)

Member of the Land Rehabilitation Society of Southern Africa (LARSSA)

Member of the South African Association of Botanists (SAAB)

Member of the South African Wildlife Management Association (SAWMA)

#### EDUCATION

##### Qualifications

MSc Plant Science (University of Pretoria)	2017
BSc (Hons) Plant Science (Invasion Biology) (University of Pretoria)	2014
BSc Environmental Science (University of Pretoria)	2013

##### Short courses and Training

- BotSoc Branch: Species Environmental Assessment Guidelines Course (2022).
- Advanced Grass Identification Course (2021).
- Practical Plant Identification, including Herbarium Usage and Protocols.
- Vegetation Classification and Mapping: Use of Geographic Information System for understanding vegetation pattern and biodiversity conservation.
- Introduction to Statistics for Biologists: Applications of plant ecology principles in plant conservation, i.e., species distribution modelling, alien plant invasions, conservation planning.
- International Plant Functional Trait Course: Hands-on, field-based exploration of plant functional traits, along with experience in the usage of plant traits data in climate-change research and ecosystem ecology. <https://www.uib.no/en/rg/EECRG/97477/plant-functional-traits-course-2>

#### AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Free State

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- Terrestrial Ecological and Biodiversity Scoping Assessments
- Terrestrial Ecological and Biodiversity Screening Assessments
- Floral Assessments
- Input into Terrestrial Rehabilitation Plan design with the focus on the re-establishment of vegetation
- Floral Rescue and Relocation Plans
- Alien and Invasive Plant Control and Management Plans (AIPCPs)
- Alien and Invasive Plant Identification and awareness training
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Desktop Studies, Mapping and Background Information Research







## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF HENNIE DE BEER

#### PERSONAL DETAILS

Position in Company	Faunal Ecologist
Joined SAS	2014, 2023

#### EDUCATION

##### Qualifications

BTech Nature Conservation (Tshwane University of Technology)	2021
National Diploma Nature Conservation (Tshwane University of Technology)	2008

#### AREAS OF WORK EXPERIENCE

**South Africa** – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Eastern Cape, Western Cape, Northern Cape and Freestate  
Mozambique

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- **Biodiversity Assessments**
- Floral Assessments
- Faunal Assessments
- Avifaunal Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

##### Freshwater Assessments

- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Rehabilitation Assessment / Planning





## SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

### CURRICULUM VITAE OF NELANIE CLOETE

#### PERSONAL DETAILS

Position in Company	Senior Scientist, Member Water Resource and Botanical Discipline Lead
Joined SAS Environmental Group of Companies	2011

#### MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 400503/14)  
 Member of the South African Association of Botanists (SAAB)  
 Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group  
 Member of the Grassland Society of South Africa (GSSA)  
 Member of the Botanical Society of South Africa (BotSoc)  
 Member of the Gauteng Wetland Forum (GWF)  
 Member of the South African Wetland Society (SAWS)

#### EDUCATION

##### Qualifications

MSc Environmental Management (University of Johannesburg)	2013
MSc Botany (University of Johannesburg)	2007
BSc (Hons) Botany (University of Johannesburg)	2005
BSc (Botany and Zoology) (Rand Afrikaans University)	2004

##### Short Courses

Certificate – Department of Environmental Science in Legal context of Environmental Management, Compliance and Enforcement (UNISA)	2009
Introduction to Project Management - Online course by the University of Adelaide	2016
Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017
Environmental legal compliance, Monitoring and Auditing	2021

#### AREAS OF WORK EXPERIENCE

**South Africa** – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Eastern Cape, Free State

**Africa** - Democratic Republic of the Congo (DRC)

#### KEY SPECIALIST DISCIPLINES

##### Biodiversity Assessments

- Floral Assessments
- Biodiversity Actions Plan (BAP) & Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Terrestrial Monitoring
- Protected Tree and Floral Marking and Reporting
- Biodiversity Offset Plan

##### Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Plant species and Landscape Plan

##### Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Environmental and Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions
- Environmental Control Officer monitoring

