

Appendix H.15

FAUNAL IMPACT ASSESSMENT





SCIENTIFIC TERRESTRIAL SERVICES

TERRESTRIAL BIODIVERSITY ASSESSMENT

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

Part C: Faunal Assessment

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DOCUMENT GUIDE

The table below provides a guide to the reporting of biodiversity impacts as they relate to 1) Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Animal Species** as published in Government Gazette No 43855 dated 30 October 2020.

No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
2	Terrestrial Biodiversity Specialist Assessment	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	Part A – C: Cover Page Part A: Appendix E
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	Part A: Section 1
2.3	The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these;	Part C: Section 3 (fauna)
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	Part C: Section 3 (fauna)
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	Part A: Section 3 (desktop analysis) Part C: Section 3 (fauna)
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;	Part A: Section 3 (desktop analysis) Part C: Section 3.2 – 3.5 (fauna)
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: <ul style="list-style-type: none"> a) main vegetation types; b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; c) ecological connectivity, habitat fragmentation, ecological processes and fine scale habitats; and d) species, distribution, important habitats (e.g. feeding grounds, nesting sites, etc.) and movement patterns identified; 	Part A: Section 3 (desktop analysis) Part C: Section 3 (fauna)
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a “low” sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	Not Applicable.
2.3.7	The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:	
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: <ul style="list-style-type: none"> a) <i>the reasons why an area has been identified as a CBA;</i> b) <i>an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;</i> c) <i>the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);</i> d) <i>the impact on ecosystem threat status;</i> e) <i>the impact on explicit subtypes in the vegetation;</i> f) <i>the impact on overall species and ecosystem diversity of the site; and</i> 	Part A: Section 3 (desktop analysis) Part C: Section 3, 4 & 6



No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
	g) <i>the impact on any changes to threat status of populations of species of conservation concern in the CBA;</i>	
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including: a) <i>the impact on the ecological processes that operate within or across the site;</i> b) <i>the extent the proposed development will impact on the functionality of the ESA; and</i> c) <i>loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;</i>	
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- a) <i>an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;</i>	Part A: Section 3 (desktop analysis) However, not applicable as no protected areas or areas of conservation concern are within 10 km of the proposed project,
2.3.7.4	Priority areas for protected area expansion, including- a) <i>the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;</i>	Part A: Section 3 (desktop analysis)
2.3.7.5	SWSAs including: a) <i>the impact(s) on the terrestrial habitat of a SWSA; and</i> b) <i>the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);</i>	Not Applicable to this report
2.3.7.6	FEPA sub catchments, including- a) <i>the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;</i>	Not Applicable to this report
2.3.7.7	Indigenous forests, including: a) <i>impact on the ecological integrity of the forest; and</i> b) <i>percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.</i>	Not Applicable to this report
2.4	The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.	
	Part C: Results of the Faunal Assessment as well as conclusions on Terrestrial Biodiversity as it relates to faunal communities.	
3	Terrestrial Biodiversity Specialist Assessment Report	
3.1	The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:	
3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Part A: Appendix E
3.1.2	A signed statement of independence by the specialist;	Part A: Appendix E
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Part C: Section 1.3 (fauna)
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Part A: Appendix C Part C: Section 2 (fauna) Part C: Appendix A (fauna)
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	Part C: Section 1.3 (fauna)
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	Part C: Section 4 (fauna)
	Impact Assessment Requirements	Part C: Section 6 (fauna)
3.1.7	Additional environmental impacts expected from the proposed development;	



No.	SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS	Section in report/Notes
	3.1.8 Any direct, indirect and cumulative impacts of the proposed development; 3.1.9 The degree to which impacts and risks can be mitigated; 3.1.10 The degree to which the impacts and risks can be reversed; 3.1.11 The degree to which the impacts and risks can cause loss of irreplaceable resources; 3.1.12 Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	
3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a “low” terrestrial biodiversity sensitivity and that were not considered appropriate;	Not Applicable to this report
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	Part A: Executive summary Part C: Section 7 (fauna)
3.1.15	Any conditions to which this statement is subjected.	Part C: Section 6.1 (fauna)
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	Not Applicable to this report
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	Not Applicable to this report



TABLE OF CONTENTS

DOCUMENT GUIDE	ii
TABLE OF CONTENTS	v
LIST OF TABLES	vi
LIST OF FIGURES	vii
ACRONYMS	viii
GLOSSARY OF TERMS	ix
1 INTRODUCTION	1
1.1 Background Information and Project Description	1
1.2. Scope of Work	2
1.3. Assumptions and Limitations	2
2 ASSESSMENT APPROACH	5
2.1 General approach	5
2.2 Sensitivity Mapping	6
2.3 Faunal Species of Conservational Concern Assessment	6
3 FAUNAL ASSESSMENT RESULTS	6
3.1 Faunal Habitat	6
3.2 Ecological Connectivity	7
3.3 Mammals	10
3.4 Herpetofauna	12
3.5 Invertebrates (Insects and Arachnids)	14
4 SENSITIVITY MAPPING	15
5 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARD 6 IMPACT ASSESSMENT	20
6 IMPACT ASSESSMENT	22
6.1 Faunal Impact Assessment Results	24
6.2 Impact Discussion	44
6.2.1 Impact on Faunal Habitat and Diversity	44
6.2.2 Impacts on Faunal SCC	45
6.2.3 Probable Residual Impacts	45
6.2.4 Cumulative Impacts	46
7 CONCLUSION	47
8 REFERENCES	50
APPENDIX A: Faunal Method of Assessment	51
APPENDIX B: Faunal SCC	57
APPENDIX C: Faunal Species List	63



LIST OF TABLES

Table 1:	Field assessment results pertaining to mammal species within the Tournée 2 Solar PV Park.	10
Table 2:	Field assessment results pertaining to herpetofaunal species within the Tournée 2 Solar PV Park.	12
Table 3:	Field assessment results pertaining to insect species within the Tournée 2 Solar PV Park.	14
Table 4:	A summary of the sensitivity of each habitat unit and implications for the proposed activities.	16
Table 5:	Habitat units classification based on the IFC PS6 standards.	20
Table 6:	Descriptions of the project requirements to meet IFC Standards and corresponding Guidance Notes for additional information.	21
Table 7:	Impact Assessment considering the impacts and mitigation surrounding the faunal habitat and diversity during the Pre-construction and Planning phase of the 150 MW Tournée 2 Solar PV Park development.	25
Table 8:	Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Pre-construction and Planning phase of the 150 MW Tournée 2 Solar PV Park development.	27
Table 9:	Impact Assessment considering the impacts and mitigation surrounding the faunal habitat and diversity during the Construction phase of the 150 MW Tournée 2 Solar PV Park development.	29
Table 10:	Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Construction phase of the 150 MW Tournée 2 Solar PV Park development.	32
Table 11:	Impact Assessment considering the impacts and mitigation surrounding the faunal habitat diversity during the Operational and Maintenance Phase of the 150 MW Tournée 2 Solar PV Park development.	35
Table 12:	Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Operational and Maintenance Phase of the 150 MW Tournée 2 Solar PV Park development.	38
Table 13:	Impact Assessment considering the impacts and mitigation surrounding the faunal habitat diversity during the Decommissioning Phase of the 150 MW Tournée 2 Solar PV Park development.	40
Table 14:	Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Decommissioning Phase of the 150 MW Tournée 2 Solar PV Park development.	42
Table 15:	Breakdown of the extent of habitat units impacted within the Tournée 2 Solar PV Park.	44
Table 16:	Impact summary table for the proposed Tournée 2 Solar PV Park on faunal habitat and diversity.	48
Table 17:	Impact summary for the proposed Tournée 2 Solar PV Park on faunal SCC ...	48



LIST OF FIGURES

Figure 1: The proposed layout option for the Tournée 2 Solar PV Park.....	4
Figure 2: Habitat unit map with the proposed layout options, Alternative 1 and Alternative 2 within the Tournée 2 Solar PV Park.....	8
Figure 3: Conceptual illustration of the habitat units and the proposed layout associated with the Tournée 2 Solar PV Park.	10
Figure 4: Conceptual illustration of the habitat sensitivities associated with the Tournée 2 Solar PV Park.	18
Figure 5: Conceptual illustration of the habitat sensitivities associated with the proposed Tournée 2 Solar PV Park layout.	19



ACRONYMS

ADU	The Animal Demography Unit online database: http://vmus.adu.org.za/ .
AIP/AIPs	Alien Invasive Plant/Alien Invasive Plants
BGIS	Biodiversity Geographic Information Systems
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
EAP	Environmental Assessment Practitioner
EIS	Ecological Importance and Sensitivity
EN	Endangered
GIS	Geographic Information System
GPS	Global Positioning System
Ha	Hectares
IBA	Important Bird Area
IEM	Integrated Environmental Management
IUCN	International Union for Conservation of Nature and Natural Resources
LC	Least Concern
NA	Not Applicable
NBA	National Biodiversity Assessment
NT	Near Threatened
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004)
NYBA	Not yet been assessed
MAMSL	Meters Above Mean Sea Level
MNCA	Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998)
MP 2003	Mpumalanga State of the Environment Report (2003).
MRA	Mining Rights Area
MTPA	Mpumalanga Tourism and Parks Agency
P	Protected, according to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004): Amendment of Critically Endangered, Endangered, Vulnerable and Protected Species List. December 2007
PES	Present Ecological State
POC	Probability of Occurrence
QDS	Quarter Degree Square
RDL	Red Data Listed
R	Rare
RE	Regionally Extinct
RSA	Republic of South Africa
SABAP	Southern African Bird Atlas Project
SANBI	South Africa National Biodiversity Institute
SP	Specially Protected
STS	Scientific Terrestrial Services
SCC	Species of Conservation Concern
sp and spp	The "sp." is an abbreviation for species. It is used when the actual species name cannot or need not or is not specified. The plural form of this abbreviation is "spp." and indicates "several species. Example: <i>Chrysoperla sp.</i> (when referring to a single species) and <i>Chrysoperla spp.</i>
TOPS	Threatened Or Protected Species (list of 2007) according to the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004):
VU	Vulnerable



GLOSSARY OF TERMS

Alien species (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.
Baseline (IEM Series)	Conditions that currently exist. Also called “existing conditions”.
Baseline information (IEM Series)	Information derived from data that: <ul style="list-style-type: none"> • records the existing elements and trends in the environment; and • records the characteristics of a given project proposal.
Biological diversity or Biodiversity (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 includes diversity within species, between species, and of ecosystems.
Community Characterisation	Comparisons can be made among communities using attributes such as species richness, species diversity, and evenness. <ul style="list-style-type: none"> - Species richness is simply the number of species in a community. - Species diversity is more complex and includes a measure of the number of species in a community, and a measure of the abundance of each species. - Species evenness is a description of the distribution of abundance across the species in a community. Species evenness is highest when all species in a sample have the same abundance. Evenness approaches zero as relative abundances vary. <p>Source: https://tinyurl.com/2p9yr3j8</p>
Corridor	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Critically Endangered (CR) (IUCN¹ Red List category)	Applied to both species/taxa and ecosystems: A species is CR when the best available evidence indicates that it meets at least one of the five IUCN criteria for CR, indicating that the species is facing an extremely high risk of extinction. CR ecosystem types are at an extremely high risk of collapse. Most of the ecosystem type has been severely or moderately modified from its natural state. The ecosystem type is likely to have lost much of its natural structure and functioning, and species associated with the ecosystem may have been lost. CR species are those considered to be at extremely high risk of extinction.
Development footprint (as per the NEMA definition)	“in respect of land, means any evidence of its physical transformation as a result of the undertaking of any activity”
Degradation	The many human-caused processes that drive the decline or loss in biodiversity, ecosystem functions or ecosystem services in any terrestrial and associated aquatic ecosystems.
Disturbance	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.
Driver (ecological)	A driver is any natural or human-induced factor that directly or indirectly causes a change in ecosystem. A direct driver clearly influences ecosystem processes, where indirect driver influences ecosystem processes through altering one or more direct drivers.
Ecological Condition	“ecological condition” means the extent to which the composition, structure and function of an area or biodiversity feature has been modified from a reference condition of “natural”. Various terminology can be used for precision of language:

¹ International Union for Conservation of Nature (IUCN)



	<ul style="list-style-type: none"> ➤ <u>Fair ecological condition</u>: Areas that are moderately modified, semi-natural. An ecological condition class in which ecological function is maintained even though composition and structure have been compromised. Can apply to a site or an ecosystem. ➤ <u>Good ecological condition</u>: Areas that are natural or near-natural. An ecological condition class in which composition, structure and function are still intact or largely intact. Can apply to a site or an ecosystem. ➤ <u>Poor ecological condition</u>: Areas that are severely or irreversibly modified. An ecological condition class in which ecological function has been compromised in addition to structure and composition. Can apply to a site or an ecosystem.
Ecological processes	The functions and processes that operate to maintain and generate biodiversity. In order to include ecological processes in a biodiversity plan, their spatial components need to be identified and mapped.
Ecoregion	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region."
Endangered (EN) (IUCN Red List category)	Applied to both species/taxa and ecosystems : A species is EN when the best available evidence indicates that it meets at least one of the five IUCN criteria for EN, indicating that the species is facing a very high risk of extinction. EN ecosystem types are at a very high risk of collapse. EN species are those considered to be at very high risk of extinction.
Endemic species	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.
Fatal flaw (IEM Series)	Any problem, issue or conflict (real or perceived) that could result in proposals being rejected or stopped.
Faunal Class	In biological classification, class (Latin: classis) is a taxonomic rank, as well as a taxonomic unit. Class specifically refers to major groups, namely: mammals, avifauna (birds), reptiles and invertebrates.
Ground-truth	Ground truth is a term used in various fields to refer to information provided by direct observation (i.e., empirical evidence) as opposed to information provided by inference.
Habitat (As per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
Habitat loss	Conversion of natural habitat in an ecosystem to a land use or land cover class that results in irreversible change in the composition, structure and functional characteristics of the ecosystem concerned.
Impact (IEM Series, draft Offset policy, and NEMA)	<p>The positive or negative effects on human well-being and/or on the environment.</p> <p>Impact-related terminology:</p> <ul style="list-style-type: none"> ➤ <u>Cumulative impact</u>: Past, current and reasonably foreseeable future impacts of an activity, considered together with the impact of the proposed activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities. ➤ <u>Impact Significant/significance</u>: Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e., intensity, duration, and likelihood). Impact significance is the value placed on the change by different affected parties (i.e., level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e., biophysical, social and economic). Such judgement reflects the political reality of impact assessment in which significance is translated into public acceptability of impacts.



	<ul style="list-style-type: none"> ➤ <u>Residual negative impacts:</u> Negative impacts that remain after the proponent has made all reasonable and practicable changes to the location, siting, scale, layout, technology and design of the proposed development, in consultation with the environmental assessment practitioner and specialists (including a biodiversity specialist), in order to avoid and minimise negative impacts, and/or rehabilitate and/or restore impacted areas within 30 years (<i>It is acknowledged that the time it takes for full restoration differs from ecosystem type to ecosystem type, as well as the local conditions. Given that there is no readily accessible information on the recovery times of the different ecosystem types in South Africa, a general timeframe had to be used. The 30-year general timeframe in the definition of "residual impact" reflects that the difficulty in restoring South African ecosystems once they have been disturbed. It is based on the risk-averse and cautious approach.</i>). ➤ <u>Significant impact:</u> 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.
Important Bird and Biodiversity Area (IBA)	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.
Indigenous vegetation (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.
Integrity (ecological)	The integrity of an ecosystem refers to its functional completeness, including its components (species) its patterns (distribution) and its processes.
Invasive species	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.
Listed invasive species	All alien species that are regulated in South Africa under the NEMBA, Alien and Invasive Species Regulations, 2020.
Least Threatened	Least threatened ecosystems are still largely intact.
Near Threatened (according to IUCN)	Close to being at high risk of extinction in the near future.
Niche (ecological)	The role and position a species have in its environment; how it meets its needs for food and shelter, how it survives, and how it reproduces. A species' niche includes all of its interactions with the biotic and abiotic factors of its environment.
Protected	Species of high conservation value or national importance that require protection, according to TOPS 2007 and NEMBA.
Red Data Listed (RDL) species	According to the Red List of South African plants (http://redlist.sanbi.org/) 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.
Refugia (ecological)	Refugium (plural: refugia) is a location which supports an isolated or relict population of a once more widespread species. This isolation can be caused by climatic changes, geography, or human activities such as deforestation and overhunting.
Resource (ecological)	A resource is a substance or object in the environment required by an organism for normal growth, maintenance, and reproduction. Resources can be consumed by one organism and, as a result, become unavailable to another organism.
Species of Conservation Concern (SCC)	The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as provincially and nationally protected species of relevance to the project.



Threatened ecosystem	An ecosystem that has been classified as CR, EN or VU, based on an analysis of ecosystem threat status. A threatened ecosystem has lost or is losing vital aspects of its structure, function, or composition. The NEMBA allows the Minister of Environmental Affairs or a provincial MEC for Environmental Affairs to publish a list of threatened ecosystems. To date, threatened ecosystems have been listed only in the terrestrial environment. In cases where no list has yet been published by the Minister, such as for all aquatic ecosystems, the ecosystem threat status assessment in the National Biodiversity Assessment (NBA) can be used as an interim list in planning and decision making.
Threatened species	A species that has been classified as CR, EN or VU, based on a conservation assessment (Red List), using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.
Trophic (ecological)	Refers to feeding and nutrition.
Vulnerable (VU) (Red List category)	Applied to both species/taxa and ecosystems: A species is VU when the best available evidence indicates that it meets at least one of the five IUCN criteria for VU, indicating that the species is facing a high risk of extinction. An ecosystem type is VU when the best available evidence indicates that it meets any of the criteria A to E for VU and is then considered to be at a high risk of collapse.



1 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) Park near Thuthukani, Mpumalanga Province.

The purpose of this report is to define the faunal ecology of the study area, to identify areas of increased Ecological Importance and Sensitivity (EIS), as well as the mapping of such areas, and to describe the Present Ecological State (PES) of the study area. The primary objective of the faunal assessment is not to compile 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 species of conservation concern (SCC) and to assess habitat suitability for other potentially occurring SCC (SANBI, 2020).

1.1 Background Information and Project Description

Tournée 2 Solar PV Park is on the remaining portion of Portion 3 of the farm DWARS-IN-DE-WEG 350 (344.1 hectares (ha) in extent), and Portion 6 of the farm DWARS-IN-DE-WEG 350 (161.1 ha in extent). The Tournée 2 Solar PV Park is surrounded by various major roadways including the R38, which is located approximately 5 km south of the proposed Tournée 2 Solar PV Park and the R38 located 1.5 kilometre (km) West of the proposed Tournée 2 Solar PV Park. The closest town, Thuthukani, occurring 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 proposed Tournée 2 Solar PV Park is located adjacent to the Tutuka Power Station Ashing facility (Part A; Figure 1). The development footprint, and all the accompanying infrastructure associated with the proposed PV park, will henceforth be referred to as the "**Tournée 2 Solar PV Park**".

The proposed Tournée 2 Solar PV Park will have a generating capacity of no more than 150 Megawatts (MW) and battery energy storage systems (BESS) of 600 megawatt-hours (MWh). Tier-1 bi-facial, single axis trackers are considered for the panels. The proposed Tournée 2 Solar PV Park will also include an on-site Independent Power Producer (IPP), which includes a back-to-back substation. The BESS's main components include the batteries installed in rows of containers, the power conversion system (inverters) and transformers.

The purpose of the facility is to generate clean electricity from a renewable energy source (i.e., solar radiation) to contribute to the National Energy Grid.



1.2. Scope of Work

The purpose of this report is to define the faunal ecology of the Tourneé 2 Solar PV Park as well as mapping and defining areas of increased Ecological Importance and Sensitivity (EIS) and to define the Present Ecological State (PES) of the Tourneé 2 Solar PV Park. The scope of work for this study is:

- To provide inventories of faunal species as encountered within the Tourneé 2 Solar PV Park;
- To determine and describe habitat types, faunal communities and the ecological state of the sites associated with the proposed Tourneé 2 Solar PV Park and to rank each habitat type based on conservation importance and ecological sensitivity;
- To identify and consider all sensitive landscapes and/ or any other special habitat features;
- To conduct a Red Data Listed (RDL) and Species of Conservation Concern (SCC) assessment, including species as listed in the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEMBA) Threatened or Protected Species (TOPS) list (Government Notice R152 in Government Gazette 29657, dated 23 February 2007, as amended), and the overall potential for such species to occur within the areas associated with the proposed Tourneé 2 Solar PV Park;
- To verify the Department of Forestry, Fisheries, and the Environment's (DFFE) national environmental screening report for the animal theme (Screening Tool) for the Tourneé 2 Solar PV Park;
- Address the application of Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) of the International Finance Corporation (IFC) and to categorise the observed habitats and faunal component into the relevant IFC defined habitat categories;
- To provide detailed information as well as relevant mitigation measures that must be implemented to guide the proposed development activities associated with the proposed Tourneé 2 Solar PV Park; and
- To ensure the ongoing functioning of the ecosystem in such a way as to support local and regional conservation requirements and the provision of ecological services in the local area.

1.3. Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The faunal assessment is confined to the Tourneé 2 Solar PV Park and does not include the neighboring and adjacent properties. The entire Tourneé 2 Solar PV Park



and immediate surroundings were, however, included in the desktop analysis of which the results are presented in **Part A: Section 3**;

- With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. It is, however, expected that most faunal communities have been accurately assessed and as such the information provided herein is considered sufficient to allow informed decision making to take place and facilitate integrated environmental management;
- Due to the nature and habits of many faunal taxa and the surrounding anthropogenic activities, it is unlikely that all species or classes would have been observed during a field assessment of limited duration;
- Sampling by its nature, means that not all individuals are assessed and identified. Some species and taxa within the footprint area may therefore have been missed during the assessment;
- The data presented in this report are based on a site assessment undertaken in October 2022 (early summer). On-site data was further augmented with all available desktop data. The findings of the field assessment is considered an adequate reflection of the faunal ecological characteristics of the Tourneé 2 Solar PV Park for the purposes of informed decision-making processes; and
- A more comprehensive assessment would require that assessments take place in all seasons of the year. However, on-site data was significantly augmented with all available desktop data and specialist experience in the area.



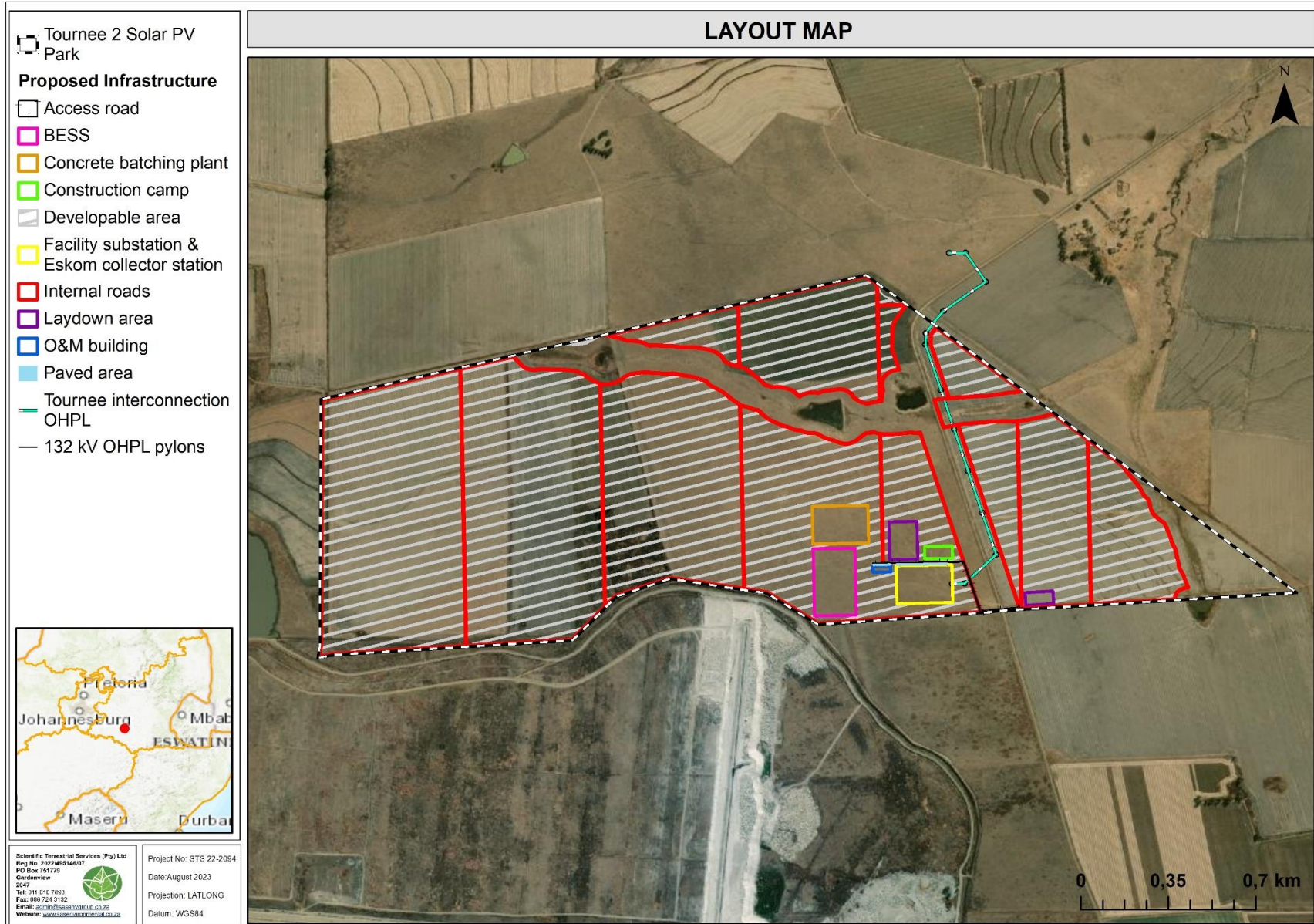


Figure 1: The proposed layout option for the Tournée 2 Solar PV Park.



2 ASSESSMENT APPROACH

STS conducted a field assessment focused solely on the Tourneé 2 Solar PV Park in 6th – 9th of February 2023 (summer), to determine the faunal ecological status of the Tourneé 2 Solar PV Park. A reconnaissance ‘walkabout’ was initially undertaken to determine the general habitat types found throughout the sites where the Tourneé 2 Solar PV Park will occur. Following this, specific study sites were selected that were considered representative of the habitats found within the study locations, with special emphasis being placed on areas that may potentially support faunal SCC. Sites were investigated on foot to identify the occurrence of fauna within the sites. Sherman and camera traps were used to increase the likelihood of capturing and observing mammal species, notably nocturnal and reclusive mammals.

A detailed explanation of the method of assessment is provided in Appendix A of this report. The faunal categories covered in this assessment are mammals, reptiles, amphibians, general invertebrates, and arachnids. For the methodologies relating to the impact assessment and development of the mitigation measures, please refer to Appendix C of Part A of the study.

2.1 General approach

In order to accurately determine the PES of the habitat and associated faunal assemblages within the sites and capture comprehensive data with respect to faunal taxa, the following methodology was applied:

- Maps and digital satellite images were consulted prior to the field assessment to determine broad habitats, vegetation types and potentially sensitive sites. An initial visual on-site assessment of the Tourneé 2 Solar PV Park was made in order to confirm the assumptions made during consultation of the digital satellite imagery;
- A literature review with respect to habitats, vegetation types and species distribution was conducted;
- Relevant databases considered during the assessment of the proposed Tourneé 2 Solar PV Park activities included online atlases on the Animal Demography Unit (ADU) Virtual Museum website; the Important Bird and Biodiversity Areas (IBA, 2015); International Union for Conservation of Nature (IUCN); iNaturalist website; South African National Biodiversity Institute (SANBI) Red List of South African Species; the Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998; MNCA), the DFFE Screening Tool and the National Biodiversity Assessment (NBA, 2018) (refer to report provided in Part A);
- Specific methodologies for the assessment, in terms of field work and data analysis of faunal ecological assemblages are presented in Appendix A of this report; and



- For the methodologies relating to the impact assessment and development of the mitigatory measures, please refer to Appendix C of Part A.

2.2 Sensitivity Mapping

All the ecological features associated with the Tournée 2 Solar PV Park were considered, and sensitive areas were assessed. A Geographic Information System (GIS) was used to project these features onto satellite imagery and/or topographic maps. The sensitivity map should assist the Environmental Assessment Practitioner (EAP) / proponent as to the suitability of the proposed development within the assessment areas. Please refer to Section 5 of this report for further details.

2.3 Faunal Species of Conservational Concern Assessment

During field assessments, it is not always feasible to identify or observe all species within an area, largely due to the secretive nature of many faunal species, possible low population numbers or varying habits of species. As such, and to specifically assess an area for faunal SCC, a Probability of Occurrence (POC) estimation is used, considering several factors to determine the probability of faunal SCC occurrence within the Tournée 2 Solar PV Park. Species listed in Appendix B whose known distribution ranges and habitat preferences include the proposed infrastructure development sites were taken into consideration. Faunal species likely to occur within the Tournée 2 Solar PV Park are indicated and briefly discussed within each of the relevant dashboards, along with their POC.

3 FAUNAL ASSESSMENT RESULTS

3.1 Faunal Habitat

The Tournée 2 Solar PV Park consists largely of agricultural fields and grassland areas utilised for grazing cattle. Natural patches of vegetation are scattered within the Tournée 2 Solar PV Park, are small in extent and fragmented. The following habitat units have been described for the Tournée 2 Solar PV Park as per Part B (Floral report):

- **Grassland Habitat:** The grassland vegetation is widespread within the proposed extent of the Tournée 2 Solar PV Park and is located amongst cultivated lands and Freshwater Ecosystems. The dominant land-use associated with these remaining sections of Grassland Habitat is grazing by livestock such as cattle;
- **Freshwater ecosystems:** Distributed through the northern and eastern portions of the Tournée 2 Solar PV Park. This habitat provided important habitat for faunal species



dependant on surface water and areas of increased moisture, whilst the increased vegetation growth provided important cover and food resources for herbivorous species; and

- **Transformed Habitat:** Portions of the Tournée 2 Solar PV Park which are characterised by habitat that has undergone significant transformation through clearance of vegetation (roads and houses) or cultivation. The agricultural fields provide limited habitat for fauna as the vegetation is largely homogenous and does not support an increased diversity of fauna.

For a breakdown of the faunal assessment and classes associated with the Tournée 2 Solar PV Park, refer to Section 3.3 – 3.5. Figures 2 and 3 depict the full extent of the Tournée 2 Solar PV Park, displaying the habitat units that were assessed with and without proposed infrastructure.

3.2 Ecological Connectivity

Although the Tournée 2 Solar PV Park is surrounded by fences, these fences are predominantly designed to restrict cattle movement. As such, faunal species from the region can easily traverse these barriers and utilise the habitat within and outside of the Tournée 2 Solar PV Park. The Freshwater ecosystems habitats serve as the primary movement corridors, as they transect the north-western and eastern boundary of the Tournée 2 Solar PV Park.



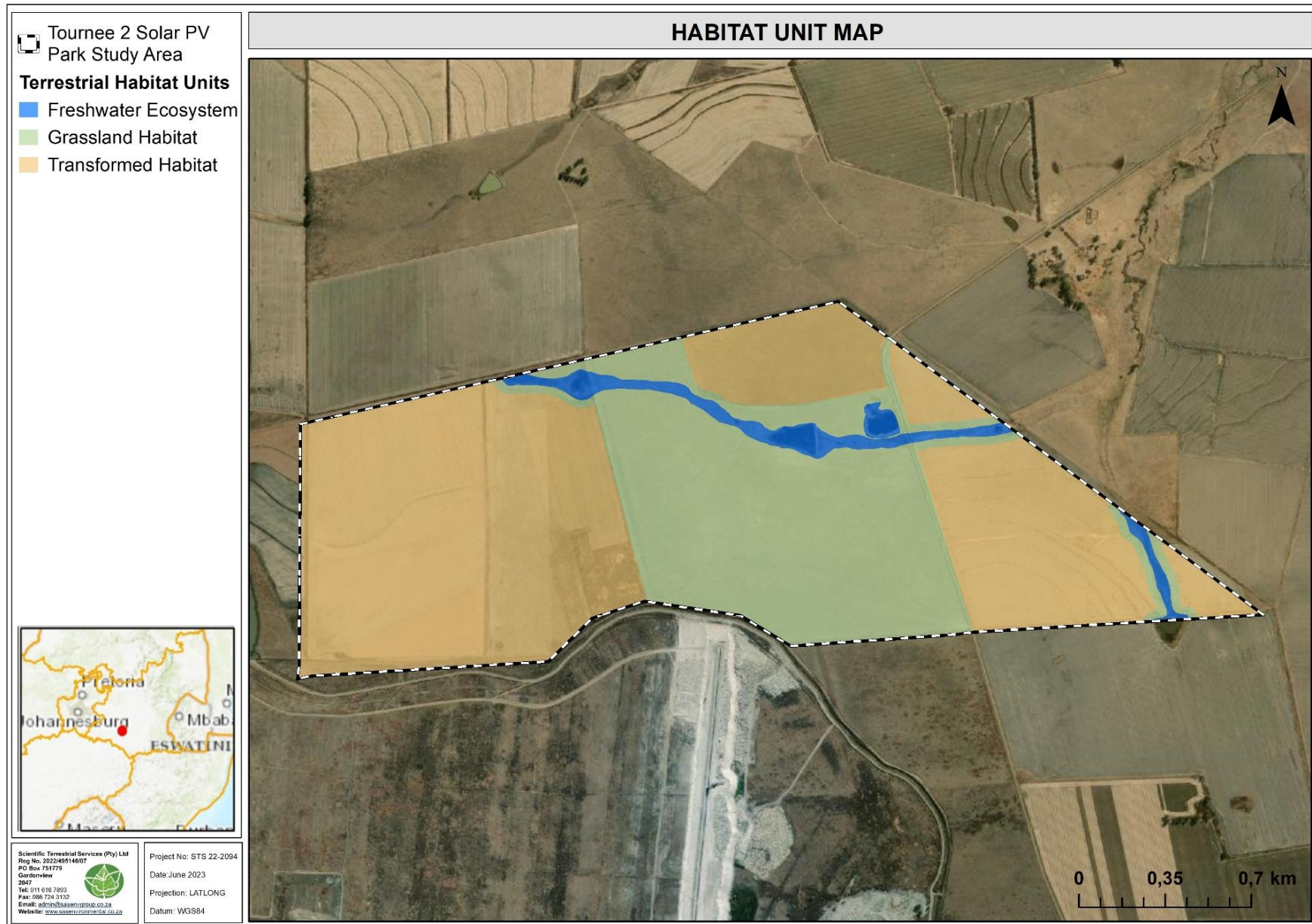


Figure 2: Habitat unit map with the proposed layout options, Alternative 1 and Alternative 2 within the Tournée 2 Solar PV Park.



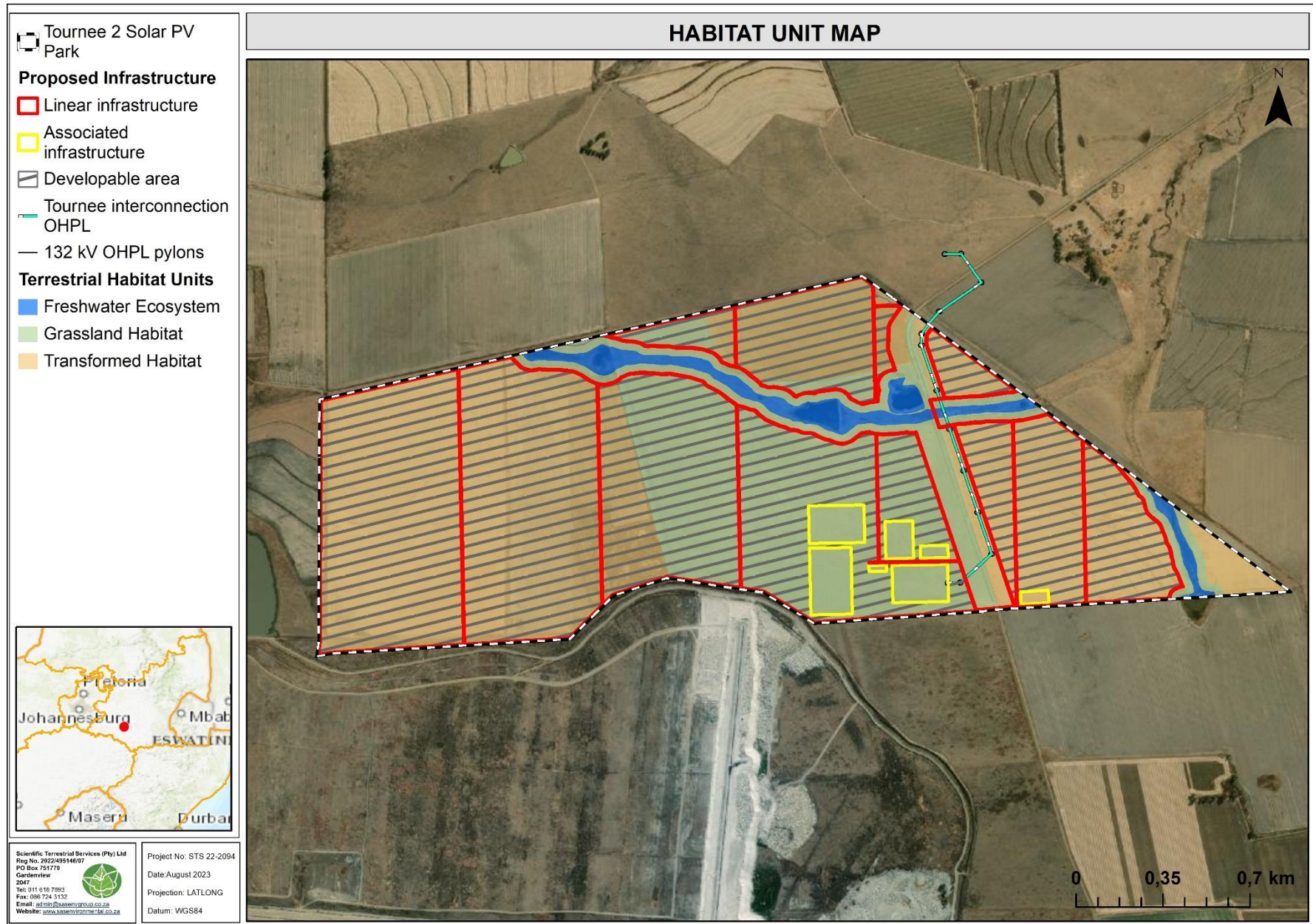

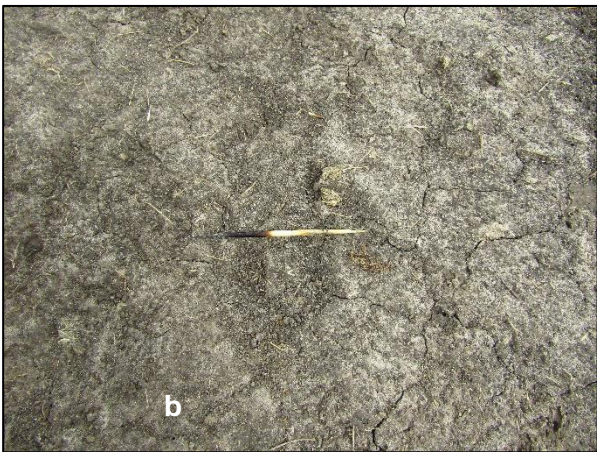



Figure 3: Conceptual illustration of the habitat units and the proposed layout associated with the Tournéé 2 Solar PV Park.

3.3 Mammals

Table 1: Field assessment results pertaining to mammal species within the Tournéé 2 Solar PV Park.

REPRESENTATIVE MAMMAL PHOTOGRAPHS FROM THE TOURNÉE 2 SOLAR PV PARK		
		
<p>a.) Spoor of <i>Sylvicapra grimmia</i> (Grey Duiker); b.) Quil of <i>Hystrix africaeaustralis</i> (Porcupine) and c.) Group of <i>Antidorcas marsupialis</i> (Springbuck) and <i>Damaliscus pygargus phillipsi</i> (Blesbok) grazing together.</p>		
MAMMAL HABITAT AND DIVERSITY OVERVIEW		
<p>Tournéé 2 Solar PV Park is situated the following Quarter Degree Square (QDS) 2629CD and Animal Demography Units (ADU) Virtual Museum (VM) indicates that there are 7 (QDS: 2629CD) recorded mammal species, whilst iNaturalist indicates no records for the area. The lack of data for this area is more likely linked to the fact that these private lands are largely under sampled, and not considered a direct indication of mammal diversity and abundance. During the site assessment, it was noted that the majority of mammal species activity (direct and indirect species observations) was centralised in around the Grassland and Freshwater ecosystem habitats. These habitats, whilst impacted by the adjacent farming practices, have been largely excluded from any cultivation / agricultural activities (ploughing) and are used primarily for grazing of cattle. This has allowed mammal species which are more adept and adapted to these agricultural areas, to continue inhabiting the Tournéé 2 Solar PV Park, albeit at lower abundances.</p> <p>The Freshwater Ecosystem habitats provide important niche habitat for water dependant mammal species, serve as an important source of surface water as well as important movement corridors for mammal species in the region. It is however noted these Freshwater Ecosystem habitats did appear to have increased levels of nitrates, likely as a result of runoff from the surrounding Transformed habitat in where fertiliser was being sowed to promote grass regrowth for fodder production. Mammal species activity / signs thereof were limited in the proposed Tournéé 2 Solar PV Park footprint area. This is likely attributable to the lack of suitable preferred habitat and the current land use activities in these areas. During the field assessment mammal species appeared to make use of the Grasslands and Freshwater ecosystem habitats, where they would likely be subjected to lower levels of anthropogenic activities and impacts.</p>		



MAMMAL SCC AND SCREENING TOOL OUTPUTS			
Species	Discussion	RSA Status	POC
<i>Crocidura maquassiensis</i> (Makwassie Musk Shrew)	<i>C. maquassiensis</i> is found in rocky, mountain habitats. It may tolerate a wider range of habitats; individuals have been recorded in mixed bracken and grassland as well as urban environments. Grassland habitat is considered of marginal suitability (IUCN, 2023). The proposed Tourneé 2 Solar PV Park layout is unlikely to pose a threat to this species nor impact on suitable habitat.	VU	Medium
<i>Ourebia ourebi</i> (Oribi)	Oribi inhabit savanna woodlands, floodplains and other open grasslands, from around sea level to about 2,000 m asl, reaching their highest density on floodplains and moist tropical grasslands, especially in association with large grazers. This species may occur within the larger Tourneé 2 Solar PV Park, however hunting by humans and dogs will likely be a notable limiting factor. This species is unlikely to occur within the proposed layout footprint due to suboptimal habitat.	EN	Low
<i>Aonyx capensis</i> (Cape Clawless Otter)	African clawless otters are primarily aquatic and reside near perennial and episodic springs or rivers. These otters prefer shallow water with thick reed beds, which are home to several favourable prey such as crab and fish. On land, African clawless otters take shelter in underground burrows, under rocks, roots, or dense vegetation. Tracks of this species were recorded in the far south-eastern section of the Tourneé 2 Solar PV Park. This core habitat will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained.	NT	Confirmed
<i>Atelerix frontalis</i> (Southern African Hedgehog)	Hedgehogs can often be found within savannah and grassland vegetation types (Skinner & Chimimba 2005). They require ample ground cover, for cover, nesting and insect food sources (Skinner & Chimimba 2005). One of the key grassland vegetation types for this species, which was observed in the Tourneé 2 Solar PV Park, however the grassland habitat may also be utilised by this species. The Tourneé 2 Solar PV Park provides suitable habitat and food resources for this species. The proposed Tourneé 2 Solar PV Park footprint is however unlikely to impact this species as the layout is located in agricultural fields. This species is more likely to occur closer to the wetland systems which will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained.	NT	Medium
<i>Leptailurus serval</i> (Serval)	Servals are mostly found in and around marshland, well-watered savannah and long-grass environments, and are particularly associated with reed-beds and other riparian vegetation types (Thiel 2015). Key vegetation types are wetlands, grasslands (with a preference for long, rank grass), and indigenous vegetation that can provide cover and allow dispersal. This core habitat will not be impacted by the proposed development and connectivity of this habitat in the landscape will be maintained.	NT	Low



3.4 Herpetofauna

Table 2: Field assessment results pertaining to herpetofaunal species within the Tournée 2 Solar PV Park.

REPRESENTATIVE HERPETOFAUNA PHOTOGRAPHS FROM THE TOURNÉE 2 SOLAR PV PARK	
	
<p>a.) Freshwater habitat that will be used by amphibian species; b.) <i>Hystrix africae australis</i> (Cape Porcupine) burrow that will be used by reptile species for refuge.</p>	
DISCUSSION	
<p>Tournée 2 Solar PV Park is situated the following Quarter Degree Square (QDS) 2629CD and Animal Demography Units (ADU) Virtual Museum (VM) indicates that there are no herpetofauna species recorded in QDS 2629CD, whilst iNaturalist indicates one amphibian species for the area. Whilst it is likely that this degree of herpetofauna diversity is underrepresented, it is notably that there are no records of SCC or RDL species for the QDS's. During the site assessment, a single common amphibian species was observed, namely <i>Amietia delalandii</i> (Common River Frog). The Freshwater Ecosystem, considered ideal habitat for amphibians, were notably devoid of amphibian activity, with no signs of tadpoles or frogs jumping from the bankside vegetation into the water. Only the larger dam in the north of the Tournée 2 Solar PV Park appeared to host several common river frog individuals, whilst this species was not observed elsewhere. Although not observed, it is likely that the Tournée 2 Solar PV Park will host several common amphibian species, as there is suitable habitat and food resources available within the Freshwater Ecosystem habitat.</p> <p>Reptiles are equally hard to detect during assessments of limited duration, however, areas of known reptile refuge (rock/rubble piles) were searched, but none were found during the field assessment, an observation of <i>Psammophylax rhombeatus</i> (Rhombic Skaapsteker) just north Tournée 2 Solar PV Park. Skinks and lizards are readily able to prey upon the abundance of insect species, whilst larger predatory snakes will readily prey upon small mammals, reptiles and amphibians within the Tournée 2 Solar PV Park.</p>	



Amphibian and reptile species will likely make use of the Freshwater Ecosystem as corridors for movement, however they will likely also traverse through the grasslands beyond the Tourneé 2 Solar PV Park boundaries. Suitable habitat can readily be found beyond the Tourneé 2 Solar PV Park boundaries, as such, but the Tourneé 2 Solar PV Park is unlikely to host unique or remnant amphibian or reptile populations. The proposed footprint is unlikely to pose a significant risk or threat to the current herpetofaunal assemblages.


HERPETOFAUNA SCC AND SCREENING TOOL OUTPUTS

Species	Discussion	RSA Status	POC
<i>Pyxicephalus adspersus</i> (Giant Bullfrog)	Inhabits a variety of vegetation types in the Grassland, Savanna, Nama Karoo, and Thicket biomes. It typically breeds in seasonal, shallow, grassy pans in flat, open areas but also utilizes non-permanent vleis and shallow water on the margins of waterholes and dams. Although they sometimes inhabit clay soils, they prefer sandy substrates. Whilst there appear to be no records of this species for the study or surrounding areas, the wetlands and degraded grasslands have the potential to host this species, and provide suitable breeding and aestivation sites. The current layout is unlikely to impact on this species, as the wetland systems, considered important for breeding, are located outside of the footprint areas. Aestivation areas, likely the Degraded Grassland habitat as it is not actively cultivated or fertilised, are also excluded from the proposed layout.	VU	Medium



3.5 Invertebrates (Insects and Arachnids)

Table 3: Field assessment results pertaining to insect species within the Tournée 2 Solar PV Park.

REPRESENTATIVE INVERTEBRATE PHOTOGRAPHS FROM THE TOURNÉE 2 SOLAR PV PARK			
 <p>a.) <i>Gryllus bimaculatus</i> (Common Garden Cricket); b.) <i>Astylus atomaculatus</i> (Spotted Maize Beetle) and c.) <i>Trithemis arteriosa</i> (Brown-veined White).</p>			
INVERTEBRATE HABITAT AND DIVERSITY OVERVIEW			
<p>Insects: The VM and iNaturalist have limited observations for the Tournée 2 Solar PV Park, with all species recorded herein being listed as common and least concern. The area is not known to host niche or specialist insect species, however this may be a result of historic land-use activities including crop spraying which may have led to the loss of such species from the region prior to more detailed sampling taking place. During the site assessment, a limited abundance and diversity of insects were observed, with the highest abundances, as expected, being around the Freshwater Ecosystem areas. Insects are usually the most abundant macro-organisms within landscapes and often perform services vitally important for ecosystem functioning. A high abundance and diversity of insects is generally accepted as being needed to help maintain healthy landscapes and ecosystems.</p> <p>Arachnids: One spider was observed, while no scorpions during the field assessment. In addition to the limited observations of arachnids, the VM and iNaturalist have no scorpion records for the QDS's. Although not observed during the site assessment, it is likely that the Tournée 2 Solar PV Park will host several common spider species of the Genus <i>Oxyopes</i> (Grass Lynx Spiders), Genus <i>Thanatus</i> and Genus <i>Hogna</i> (Wolf Spiders). Scorpions are notably hard to detect as they are predominantly nocturnal, seeking refuge in burrows and under rocks / fallen logs during the day. The Tournée 2 Solar PV Park may provide habitat to common scorpion species such as <i>Uroplectes triangulifer</i> (Highveld Lesser-Thicktail Scorpion).</p>			
INVERTEBRATE SCC AND SCREENING TOOL OUTPUTS			
Species	Discussion	RSA Status	POC
<i>Lepidochrysops procera</i> (Potchefstroom Blue)	This species is best known from rocky areas in grassland (and grassy areas in savanna), where it is supported by its larval host plant, <i>Ocimum obovatum</i> . The early life stages of this species are unrecorded, but the presence of the host ant (probably a <i>Camponotus</i> species) will be an additional requisite. No activities are planned for areas of preferred habitat as such, this species is not considered to be at risk from the proposed activities.	Rare	Low



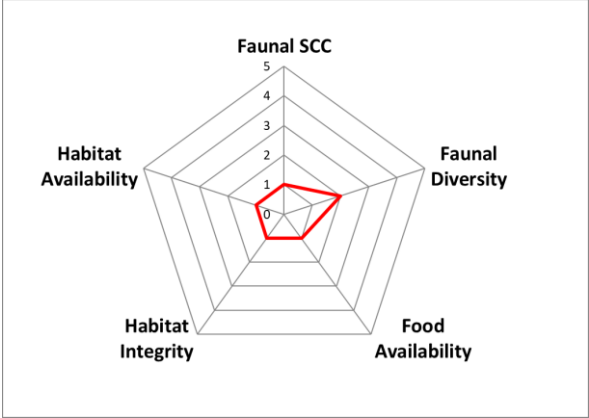
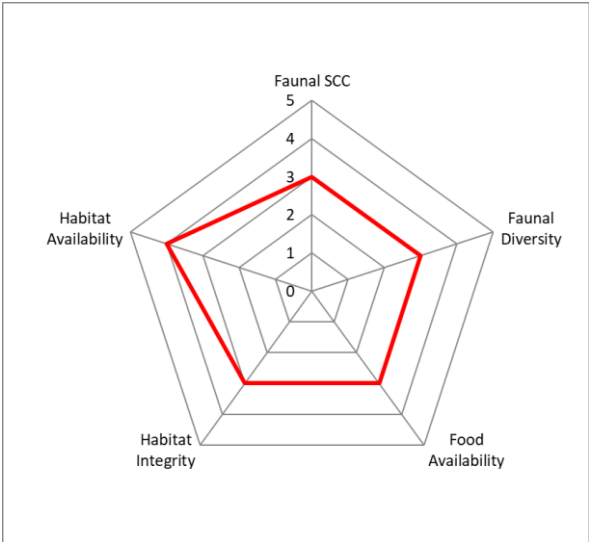
4 SENSITIVITY MAPPING

Table 4 below lists the habitat sensitivities based on the ground-truthed results of the faunal field assessment and literature reviews. An associated conservation objective and implications for development is provided for each sensitivity.

Figures 4 - 5 below conceptually illustrates the faunal ecological sensitivity for the Tourneé 2 Solar PV Park. The areas are depicted according to their sensitivity in terms of the presence or potential for faunal SCC, habitat integrity, levels of disturbance and overall levels of diversity.



Table 4: A summary of the sensitivity of each habitat unit and implications for the proposed activities.

Habitat Unit	Habitat Sensitivity Graph	Sensitivity	Key Habitat Characteristics
<p>Transformed Habitat</p>		<p>LOW <u>Conservation Objective</u> Optimise development potential.</p>	<ul style="list-style-type: none"> - This habitat is characterised by disturbed areas and little to no natural vegetation remains; - Expansion into this habitat will have very limited impacts to faunal species; and - No threatened species are expected to reside within this habitat unit.
<p>Grassland Habitat</p>		<p>INTERMEDIATE <u>Conservation Objective</u> Preserve and enhance biodiversity of the habitat unit and surrounds while optimising development potential.</p>	<ul style="list-style-type: none"> - Habitat remains largely intact with minimal disturbances to faunal habitat. - Ecological connectivity has not been impacted upon and faunal species are able to readily move through and in and out of the Tourneé 2 Solar PV Park. - Habitat comprises natural vegetation, providing food resources and shelter to faunal species common to the region. - One mammal SCC observed on site. - Several other SCC have medium POCs for the Tourneé 2 Solar PV Park.



Habitat Unit	Habitat Sensitivity Graph	Sensitivity	Key Habitat Characteristics
<p>Freshwater Ecosystem</p>		<p>HIGH</p> <p><u>Conservation Objective</u></p> <p>Preserve and enhance the biodiversity of the habitat unit, no-go alternative must be considered.</p>	<ul style="list-style-type: none"> - The Freshwater Ecosystem Habitat functions as an important ecological system and an important movement corridor for fauna; - Ecological connectivity has not been impacted upon and faunal species are able to readily move through and in and out of the Tourneé 2 Solar PV Park. - Habitat comprises natural vegetation, providing food resources and shelter to faunal species common to the region. - One mammal SCC observed on site. - Several other SCC have medium POCs for the Tourneé 2 Solar PV Park.



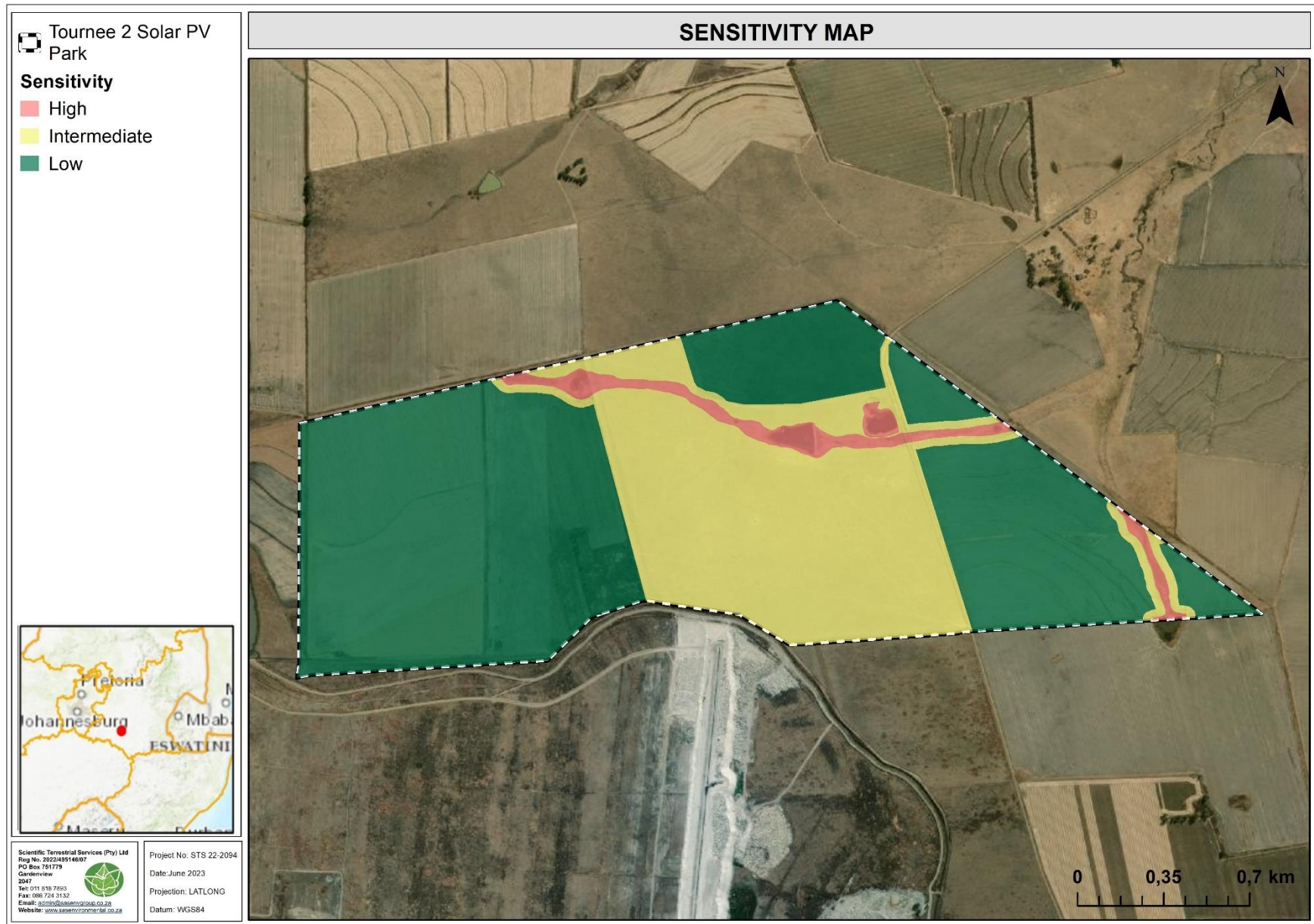


Figure 4: Conceptual illustration of the habitat sensitivities associated with the Tournee 2 Solar PV Park.



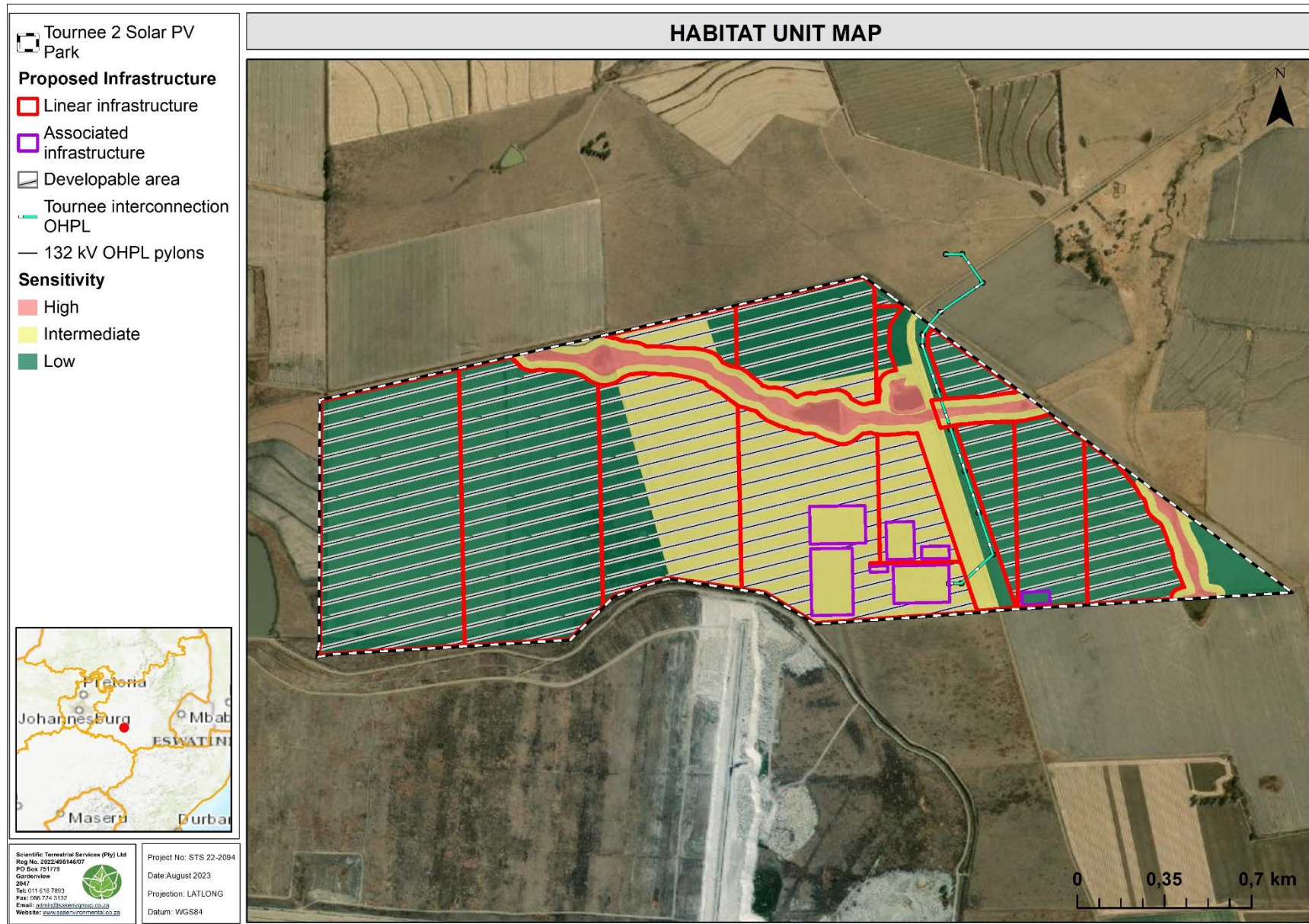


Figure 5: Conceptual illustration of the habitat sensitivities associated with the proposed Tournee 2 Solar PV Park layout.



5 INTERNATIONAL FINANCE CORPORATION PERFORMANCE STANDARD 6 IMPACT ASSESSMENT

Based on the Performance Standard 6 (Biodiversity Conservation and Sustainable Management of Living Natural Resources) of the International Finance Corporation (IFC), the below table (Table 3) categorises the observed habitat units into the relevant IFC defined habitat categories. For a description of the IFC Habitat categories refer to Appendix A.

Table 5: Habitat units classification based on the IFC PS6 standards.

Habitat Unit	Description	Applicable IFC Habitat and applicable Criteria
GRASSLAND HABITAT	The Grassland Habitat has undergone minor modifications and is considered to be in a fair ecological condition , i.e., moderately modified, semi-natural and in which ecological function is maintained even though composition and structure have been compromised.	Natural habitat , 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. Additional Considerations: GN9 as well as GN104 and GN106 are applicable within this habitat unit.
TRANSFORMED HABITAT	Anthropogenic Landscapes Habitat integrity has entirely been diminished. The habitat is in a poor ecological condition , i.e., severely, or irreversibly modified and in which ecological function has been compromised in addition to structure and composition of the habitat.	Modified habitat 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. Additional Considerations: GN36, GN104 and GN106, are applicable within this habitat unit.
FRESHWATER ECOSYSTEM	Habitat integrity of the Freshwater ecosystems are considered to be intact and within a good ecological condition , i.e., habitat still natural with an ecological condition class in which composition, structure and function are still intact or largely intact.	Critical habitat , i.e., Critical habitats are areas with high biodiversity value, including (i) habitat of significant importance to CR and/or EN 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. Additional Considerations: GN22, GN9, GN104 and GN106 are applicable within this habitat unit.



The table below serves to define the corresponding Guidance Note 6 corresponds to Performance Standard 6 identified for the specific project. General Notices identified for the specific project are summarised in the table below (Table 6). For a list (description and IFC listed requirement) of the particular Guidance Notes applicable to this project please refer to Table A2 (Appendix A).

Table 6: Descriptions of the project requirements to meet IFC Standards and corresponding Guidance Notes for additional information.

IFC Habitat Unit Discussion	
GN9	<p>No significant loss of natural or critical habitat associated with the Transformed Habitat, due to these habitat units falling under the IFC's "Modified Habitat" classification. However, considering the Grassland Habitat (Natural Habitat) approximately 140 ha is anticipated to be lost during the development of the Tourneé 2 Solar PV Park.</p> <p>For the Freshwater Habitat, which are considered "Critical Habitat", the proposed Tourneé 2 Solar PV Park footprint is not considered to impact on this habitat unit, based on preliminary layout provided.</p> <p>The GN9 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. While additional floral assessments can be conducted, for example in November (MTPA, 2006) the findings of this assessment are considered an accurate reflection of the floral ecological characteristics associated with Tourneé 2 Solar PV Park for the purposes of an informed decision-making processes.</p>
GN22	<p>The Freshwater Ecosystems are considered to be Critical Habitat, while no development is anticipated within this habitat unit, the potential risk of residual impacts is expected to occur. Therefore, within the impact assessment section the residual impacts exists, and mitigation measures provided to minimised the potential risk and impacts to Freshwater Ecosystems.</p>
GN36	<p>Not all-Natural Habitat could be avoided (i.e., Grassland Habitat), however the proposed layout areas have avoided the habitat identified as Critical Habitat (i.e., Freshwater Ecosystems). The proposed Tourneé 2 Solar PV Park layout mostly located within the remaining Modified Habitat within the Tourneé 2 Solar PV Park area.</p>
GN104	<p>All habitat units were associated with AIPs and will require a management plan to control spread of such species during all the phases of the proposed Tourneé 2 Solar PV Park.</p>
GN106 and GN109	<p>Ecosystem services are largely associated with the Freshwater Ecosystem, which is completely avoided in the proposed layout. See the Freshwater report (SAS 22-1193; 2023 for discussion on goods and service provisioning) for mitigation measures (i.e., to conserve the ecosystem functioning of the freshwater habitat) of remaining extent of the Freshwater Ecosystems areas in the prosed layout of Tourneé 2 Solar PV Park.</p> <p>The Grassland Habitat provides some ecosystem services, for example nutrient cycling, carbon storage and seed dissemination (to name a few). The loss of approximately 140 ha of habitat which can contribute to food provisioning and other supporting ecosystem services is expected with the loss of Grassland Habitat.</p> <p>The Transformed Habitat which is associated with cultivated areas (e.g., <i>Glycine max</i> and <i>Zea mays</i>) contributes largely to the provisioning of food sources as an ecosystems service. Approximately 139,57 ha of Transformed Habitat is expected to be utilized by the proposed Tourneé 2 Solar PV Park layout.</p>



6 IMPACT ASSESSMENT

Table 6-13 below serves to summarise the significance of perceived impacts on the faunal ecology of the 150 MW Tourneé 2 Solar PV Park, according to the method described in Part A - Appendix C, as provided by the proponent.

An impact discussion and assessment of all potential i) Pre-construction & Planning, ii) Construction, and iii) Operational and Maintenance and iv) Decommissioning Phase impacts are provided in Section 7.1. All mitigatory measures required to minimise the perceived impacts are presented in the impact tables. 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 takes place. 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.

Impacts to each of the habitat units were assessed independently for each phase of the project. Where activities are perceived to have similar impacts to the receiving environment (or will be impacting in the same area), these were grouped and assessed together:

- **Associated Infrastructure:**
 - BESS;
 - Concrete batching plant;
 - Construction camp;
 - Facility substation & Eskom collector station;
 - Laydown area;
 - O&M building; and
 - Paved areas.

- **Surface Infrastructure:**
 - Developable areas (i.e., where the bi-facial panels will be placed).



➤ **Linear Developments:**

- Access roads;
- Internal roads; and
- Interconnected OHPL.

The Decommissioning process and intended end-goal was not provided at the time of assessment. As such, it will be recommended that the post-closure landscape should attempt to reinstate, as far as is feasible, a wilderness landscape resembling the surrounding areas and comprising indigenous vegetation from the reference states. The impact assessment will be undertaken with this assumption and when a post-closure goal is established and, if it differs from what is recommended in this report, the impact assessment will have to be updated accordingly.



6.1 Faunal Impact Assessment Results

The below section provides the findings of the impact assessment undertaken with reference to the perceived impacts prior to the implementation of mitigation measures and following the implementation of mitigation measures. The mitigated results of the impact assessment have been calculated on the premise that all mitigation measures as stipulated in this report are adhered to and implemented. Should such actions not be adhered to, it is highly likely that post-mitigation impact scores will increase.



Table 7: Impact Assessment considering the impacts and mitigation surrounding the faunal habitat and diversity during the Pre-construction and Planning phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – Loss of faunal SCC	STATUS	NEGATIVE
Impact Description		Potential poor planning of vegetation clearing for the proposed Tourneé 2 Solar PV Park, which will lead to faunal habitat loss, species displacement and a decrease in faunal diversity. Potential increased mortality rates of fauna, due to not having mitigations in place to lower the risk of human-wildlife conflict caused by potential moving vehicle collisions and potential snaring / poaching within the proposed Tourneé 2 Solar PV Park. It is of the utmost importance that an AIP control and management plan be developed before construction of the proposed Tourneé 2 Solar PV Park commence, as the possible spread of AIPs and habitat fragmentation may lead to lower habitat integrity as secondary impacts. Potential inappropriate planning may lead to Loss of habitat connectivity and potential for increased faunal mortality rates as species become stuck in fences		
Impact Source(s)		<ul style="list-style-type: none"> • Potential failure to put in place suitable management measures to ensure that the Freshwater Ecosystem Habitat is not disturbed during construction activities; • Potential failure to implement the required mitigation measures before and at the commencement of construction activities: <ul style="list-style-type: none"> ○ Potential failure to have a Rehabilitation Plan developed, and implemented, before the commencement of the project activities; ○ Potential failure to implement an Alien and Invasive Plant (AIP) Management/Control Plan before construction activities commence; and • Failure to make allowances for the movement of small mammals through the perimeter fence line of the Tourneé 2 Solar PV Park PV Facility in order to maintain a semblance of habitat connectivity. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	4	2
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	4	2
		Significance (S)	(-) 44	(-) 18
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	2
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 30	(-) 18
		Environmental Significance Rating	Low	Low
		Impact Magnitude (M)	2	2



Transformed Habitat	PV facility and associated infrastructure	Impact Extent (E)	2	2
		Impact Reversibility (R)	3	2
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 27	(-) 16
		Environmental Significance Rating	Low	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	1	1
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 18	(-) 10
		Environmental Significance Rating	Low	Very Low
		CUMULATIVE IMPACTS	According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.	
CONFIDENCE	High			
MITIGATION MEASURES	<ul style="list-style-type: none"> • Where possible, and feasible, all planning of access roads should be kept to existing roads so to reduce fragmentation of existing natural habitat; • Minimise loss of indigenous vegetation where possible through planning and adherence to suitable layouts; • It is considered imperative that the development area be optimised and that all sensitive areas be avoided as far as possible (Freshwater Ecosystem Habitat). This is in line with the DFFE (2013) mitigation hierarchy that stipulates high risk activities must be avoided first and foremost; • Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the Tourneé 2 Solar PV Park In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Small culverts should be placed every 200m in the fence to allow for the movement of small species through the fence safely; • Design of infrastructure should be environmentally sound and all construction equipment to be utilised must be a good working condition, and all possible precautions taken to prevent potential faunal collisions and mechanical spills and/or leaks; • Prior to the commencement of construction activities, an authorised AIP Management/Control Plan should be compiled for implementation; • Prior to the commencement of construction activities on site, a rehabilitation plan should be developed; and • At all times, ensure that sound environmental management is in place during the planning phase. 			



Table 8: Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Pre-construction and Planning phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – Loss of faunal SCC	STATUS	NEGATIVE
Impact Description		Potential poor planning of vegetation clearing for the proposed Tourneé 2 Solar PV Park, which will lead to faunal SCC habitat loss. Potential increased mortality rates of faunal SCC, due to not having mitigations in place to lower the risk of human-wildlife conflict caused by potential moving vehicle collisions and snaring / poaching within the proposed Tourneé 2 Solar PV Park. It is of the utmost importance that a AIP control and management plan be developed before construction of the proposed Tourneé 2 Solar PV Park commence, as the possible spread of AIPs may lead to lower habitat integrity as secondary impacts. Poor planning may lead to Loss of habitat connectivity and potential for increased faunal SCC mortality rates as species become stuck in fences.		
Impact Source(s)		Potential failure to implement the required mitigation measures before and at the commencement of construction activities: <ul style="list-style-type: none"> ○ Potential failure to have a Rehabilitation Plan developed, and implemented, before the commencement of the project activities; and ○ Potential failure to implement an Alien and Invasive Plant (AIP) Management/Control Plan before construction activities commence. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	5	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 44	(-) 24
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	5	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	5	3
		Significance (S)	(-) 55	(-) 24
		Environmental Significance Rating	Moderate	Low
CUMULATIVE IMPACTS		According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the		



	<p>landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.</p>
<p>CONFIDENCE</p>	<p>High</p>
<p>MITIGATION MEASURES</p>	<ul style="list-style-type: none"> • Where possible, and feasible, all access roads should be kept to existing roads so to reduce fragmentation of existing natural habitat; • Footprint areas should be kept as small as possible. Site boundaries should be clearly demarcated so as to ensure that vegetation beyond the authorised footprint is not cleared; • Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the Tourneé 2 Solar PV Park. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Small culverts should be placed every 200m in the fence to allow for the movement of small species through the fence safely; • A documented rescue and relocation plan of action must be in place prior to commencement of construction and operational activities so all personnel are aware of the requirements should a faunal SCC be encountered; • Prior to vegetation clearing activities, the site should be inspected for the presence of SCC, including reptiles. If located, these species should be carefully rescued and relocated as per an approved rescue and relocation plan that must be developed; <ul style="list-style-type: none"> ○ Permits are to be obtained from all relevant authorities prior to the relocation of any faunal SCC; • Prior to the commencement of construction activities, an authorised AIP Management/Control Plan should be compiled for implementation; and • Prior to the commencement of construction activities on site, a rehabilitation plan should be developed.



Table 9: Impact Assessment considering the impacts and mitigation surrounding the faunal habitat and diversity during the Construction phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – Loss of faunal habitat and potential species diversity	STATUS	NEGATIVE
Impact Description		The most significant impact will occur with the vegetation clearing for the proposed Tourneé 2 Solar PV Park, which will lead to faunal habitat loss, species displacement and a decrease in faunal diversity. Increased loss of habitat connectivity and ecological functioning due to unplanned and uncontrolled site clearing and removal of faunal habitat. Potential increased mortality rates of fauna, due to collision with moving vehicles, human-wildlife conflict (notably snakes) and potential snaring / poaching within the proposed Tourneé 2 Solar PV Park and along the access road. Possible spread of AIPs and habitat fragmentation may lead to lower habitat integrity as secondary impacts.		
Impact Source(s)		<ul style="list-style-type: none"> • Potential non-adherence to final approved layout plans; • Increased human presence associated with the proposed development, contributing to: <ul style="list-style-type: none"> ○ Potential hunting/trapping/removal/collection of faunal species; and ○ Increased human activity will lead to the displacement and/or loss of faunal species; • Potential uncontrolled and unplanned site clearing and the removal of faunal habitat; • Potential dumping of excavated and construction material outside of designated areas; • Potential that edge effects of the proposed activities are poorly managed; • Possible increased fire frequency during construction activities; • Increased risk of faunal collisions with construction vehicles; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post – mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	4	3
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	5	5
		Significance (S)	(-) 65	(-) 60
		Environmental Significance Rating	High	Moderate
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	4	3
		Impact Extent (E)	3	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	5	5
		Significance (S)	(-) 70	(-) 60
		Environmental Significance Rating	High	Moderate



Transformed Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	1	1
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	5	5
		Significance (S)	(-) 30	(-)25
		Environmental Significance Rating	Low	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	1	1
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	5	5
		Significance (S)	(-) 30	(-)25
		Environmental Significance Rating	Low	Low
Freshwater Ecosystems	Linear development: - Access roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	3
		Impact Extent (E)	1	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	3	2
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 40	(-)27
		Environmental Significance Rating	Moderate	Low
CUMULATIVE IMPACTS		According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.		
CONFIDENCE		High		
MITIGATION MEASURES		<ul style="list-style-type: none"> Footprint areas should be kept as small as possible. Site boundaries should be clearly demarcated so as to ensure that vegetation beyond the authorised footprint is not cleared; No development should occur within the Freshwater Ecosystem Habitat or within the relevant zones of regulation around these features present within the proposed PV plant area. A corridor for the movement of fauna should be maintained within the proposed project footprint; Construction equipment should be restricted to travelling only on designated roadways or within the intended development footprint to limit the ecological footprint of the development activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimum; 		



	<ul style="list-style-type: none"> • Access road for construction should be gravel. Post construction and before operation of PV plant permeable paving is recommended (e.g. grassblock) in areas where areas should be paved; • Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the solar farm. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Small culverts should be placed every 200m in the fence to allow for the movement of small species through the fence safely; • Care should be taken during the construction and before operation of the proposed development to limit edge effects to surrounding natural habitat. This can be achieved by: <ul style="list-style-type: none"> ○ Demarcating all footprint areas during construction activities; ○ No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility; ○ All soil compacted as a result of construction activities (outside of the development footprint) should be ripped, profiled and reseeded; and ○ Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. • 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 insects to the project areas and may increase bat collisions or electrocutions. Furthermore increased lighting will impose upon the nights darkness altering invertebrate movement. Lights should not be LED or white light; • If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line and faunal recolonization. In the event of a breakdown, maintenance of vehicles must take place with care, and the collection of spillages should be practised preventing the ingress of hydrocarbons into the topsoil; • No hunting/trapping or collecting of faunal species is allowed; • No illicit fires must be allowed during the construction phase of the proposed development; • A rehabilitation plan should be compiled by a suitable specialist. This rehabilitation plan should consider all development phases of the project indicating rehabilitation actions to be undertaken during, and once construction has been completed as well as ongoing rehabilitation during the operational phase of the project to ensure habitat for fauna is restored; • Any natural areas beyond the development footprint, that have been affected by the construction activities, must be rehabilitated using indigenous plant species; • Revegetation of disturbed areas should be carried out in order to restore habitat availability and minimise soil erosion and surface water runoff; • When rehabilitating a footprint site, it is imperative that as far as possible the habitat that was present prior to disturbances is recreated, so that faunal species that were displaced by vegetation clearing activities are able to recolonize the rehabilitated area; • Smaller species of invertebrates and reptiles are likely to be less mobile during colder periods, as such should any be observed in the footprint areas during clearing and operational activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction and Operational personnel are to be educated about these species and the need for their conservation. Harmless reptiles should be carefully relocated by a suitably nominated construction person. For larger venomous snakes, a suitable construction official should be contacted to affect the relocation of the species, should it not move off on its own;
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	<ul style="list-style-type: none"> • All faunal species rescued must be relocated to a suitable area, with similar habitat adjacent to the footprint area or within the property; • Maintain habitat connectivity and corridors for species movement; • Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal SCC outside of the proposed project footprint area. An on-site Environmental Control Officer (ECO) should monitor and mitigate any edge effects throughout the life of the operation; • No additional habitat is to be disturbed outside of the approved footprints areas. Weekly (recommended) to monthly (minimum requirement) monitoring and recording of the footprint areas must be done during the construction phase by the ECO and photographic records kept – special attention should also be paid to the potential increase and spread of AIPs; • No dumping of waste on site should take place. As such it is advised that waste disposal containers and bins be provided during the construction phase for all dilapidates, rubble and general waste; • At all times, ensure that sound environmental management is in place; <ul style="list-style-type: none"> - It is recommended that after vegetation clearing during the construction phase, vegetation regrowth must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal species and will aid in preventing soil erosion.
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Table 10: Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Construction phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – Loss of faunal SCC	STATUS	NEGATIVE
Impact Description		The most significant impact will occur with the vegetation clearing for the proposed Tourneé 2 Solar PV Park, which will lead to faunal SCC habitat loss and displacement. Increased loss of habitat connectivity and ecological functioning due to unplanned and uncontrolled site clearing and removal of faunal SCC habitat. Potential increased mortality rates of faunal SCC, due to collision with moving vehicles, human-wildlife conflict (notably snakes) and potential snaring / poaching within the proposed Tourneé 2 Solar PV Park. Possible spread of AIPs and habitat fragmentation may lead to lower habitat integrity as secondary impacts.		
Impact Source(s)		<ul style="list-style-type: none"> • Non-adherence to final layout plans; • Increased human presence associated with the proposed development, contributing to: <ul style="list-style-type: none"> ○ Potential hunting/trapping/removal/collection of faunal SCC; and ○ Increased human activity will lead to the displacement and/or loss of faunal SCC; • Potential uncontrolled and unplanned site clearing and the removal of faunal habitat; • Potential dumping of excavated and construction material outside of designated areas; • Potential that edge effects of the proposed activities are poorly managed; • Possible increased fire frequency during construction activities; • Increased risk of faunal collisions with construction vehicles; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
		Impact Magnitude (M)	2	2



Grassland Habitat	PV facility and associated infrastructure	Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 20
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	2
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	5	3
Significance (S)		(-) 55	(-) 30	
Environmental Significance Rating	Moderate	Low		
Transformed Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	2	2
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	2	2
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 27	(-) 16
	Environmental Significance Rating	Low	Low	
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	2
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
Probability of Occurrence (P)		5	3	
Significance (S)		(-) 55	(-) 30	
Environmental Significance Rating	Moderate	Low		
Freshwater Ecosystems	Linear development: - Access roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	3
		Impact Extent (E)	1	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	3	2
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 40	(-) 27
		Environmental Significance Rating	Moderate	Low



<p>CUMULATIVE IMPACTS</p>	<p>According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.</p>
<p>CONFIDENCE</p>	<p>High</p>
<p>MITIGATION MEASURES</p>	<ul style="list-style-type: none"> • Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC habitat outside of the proposed development footprint; • Perimeter fences must be designed in such a way so as to allow for small faunal species movement in and out of the solar farm. In this regard, the use of electric perimeter fencing is discouraged to ensure electrocution of species does not occur. Small culverts should be placed every 200m in the fence to allow for the movement of small species through the fence safely; • Prior to vegetation clearing activities, the site should be inspected for the presence of SCC, including reptiles. If located, these species should be carefully rescued and relocated as per an approved rescue and relocation plan that must be developed; <ul style="list-style-type: none"> ○ Permits are to be obtained from relevant authorities prior to the relocation of any faunal SCC; • Smaller species such as reptiles are likely to be less mobile during the colder period, as such should any be observed in the study site during construction activities, they are to be carefully and safely moved to an area of similar habitat outside of the disturbance footprint. Construction personnel are to be educated about these species and the need for their conservation. Harmless scorpion or reptiles should be carefully relocated by a nominated construction person or staff member. For venomous snakes or scorpions, a suitably trained official or specialist should be contacted to affect the relocation of the species, should it not move off on its own; • A suitable rescue and relocation plan should be developed and overseen by a suitably qualified specialist should SCC be identified within the project areas in order to ensure that species loss during construction activities is kept to a minimum; • No collection or hunting of any fauna species is to be allowed by personnel during the construction phase, especially with regards to faunal SCC (if encountered and not part of a rescue/relocation plan); • No unauthorised fires are to be allowed on the site; • Minimise loss of indigenous vegetation where possible through the planning of suitable faunal corridors. As far as possible layouts must avoid placement within habitat of increased sensitivity; • The development footprint is to be located outside the Freshwater Ecosystem Habitat or within the relevant zones of regulation around these features. Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal habitat and SCC outside of the footprint area. An on-site ECO should monitor and mitigate any edge effects throughout the operation; • It is recommended that after vegetation clearing during the construction phase, vegetation regrowth must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal SCC and will aid in preventing soil erosion.



Table 11: Impact Assessment considering the impacts and mitigation surrounding the faunal habitat diversity during the Operational and Maintenance Phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – faunal habitat and diversity	STATUS	NEGATIVE
Impact Description		Potential ineffective rehabilitation of exposed and impacted areas leading to vegetation succession and a possible reduction of faunal diversity over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tourneé 2 Solar PV Park. Potential poor management and failure to monitor rehabilitation efforts, leading to: <ul style="list-style-type: none"> ○ Landscapes being left fragmented, resulting in reduced migration capabilities of faunal species, isolation of faunal populations and a decrease in faunal diversity; ○ Increased storm water run-off; ○ Compacted soils limiting the re-establishment of natural vegetation; and ○ Increased risk of erosion in areas left disturbed. 		
Impact Source(s)		<ul style="list-style-type: none"> • Increased risk of faunal collisions with vehicles; • Altered species movement patterns and habitat utilisation in the local area; • Uncontrolled cutting of vegetation below the PV panels; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	4	2
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 52	(-) 36
		Environmental Significance Rating	Moderate	Moderate
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	2
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	4	2
		Significance (S)	(-) 48	(-) 22
		Environmental Significance Rating	Moderate	Low
		Impact Magnitude (M)	2	1



Transformed Habitat	PV facility and associated infrastructure	Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 20
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	1
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
Significance (S)		(-) 33	(-) 20	
	Environmental Significance Rating	Moderate	Low	
Freshwater Ecosystems	Linear development: - Access roads;	Impact Magnitude (M)	2	1
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 20
		Environmental Significance Rating	Moderate	Low
CUMULATIVE IMPACTS		According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.		
CONFIDENCE		High		
MITIGATION MEASURES		<ul style="list-style-type: none"> All vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the development activities; No hunting/trapping or collecting of faunal species is allowed; Lights should face downwards to reduce the abundance of insects and any other fauna attracted to light. Invertebrates may attract bats to the project areas and may increase bat collisions or electrocutions. Furthermore, increased lighting will impose upon the nights darkness altering invertebrate movement. Lights should not be LED or white light; 		



	<ul style="list-style-type: none">• Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas which may alter the suitability of the habitat to faunal species;• Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which comply with legal standards;• No illicit fires must be allowed;• Where bare soils are left exposed as a result of construction activities, they should be immediately rehabilitated. Rehabilitated efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated;• Rehabilitation must proceed in accordance with the approved rehabilitation plan and must aim to achieve more than rehabilitation but must ensure that the veld is restored, at least, to a point where natural processes can re-instate the environment to a state that has the majority of the elements of biodiversity can be re-instated and supported;• Preserve, enhance, restore or replace faunal movement corridors and habitat, important the freshwater ecosystem habitat;• Edge effect control needs to be implemented to ensure no further degradation and potential loss of faunal SCC outside of the proposed project footprint area. An on-site Environmental Control Officer (ECO) should monitor and mitigate any edge effects throughout the life of the operation;• No additional habitat is to be disturbed outside of the approved footprints areas. Bi-annual (minimum requirement) monitoring and recording of the footprint areas must be done during the operational and maintenance phase by the ECO and photographic records kept – special attention should also be paid to potential increase and spread of AIPs;• Rehabilitation should only cease once a suitably qualified team of ecologists sign off that the rehabilitation and restoration is adequate; and• It is recommended that vegetation regrowth during the Operational and Maintenance Phases must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal species and will aid in preventing soil erosion.
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Table 12: Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Operational and Maintenance Phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – Loss of faunal SCC	STATUS	NEGATIVE
Impact Description		Potential ineffective rehabilitation of exposed and impacted areas leading to vegetation succession and a possible reduction of faunal SCC habitat over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tourneé 2 Solar PV Park. Potential poor management and failure to monitor rehabilitation efforts, leading to: <ul style="list-style-type: none"> ○ Landscapes being left fragmented, resulting in reduced migration capabilities of faunal SCC species, isolation of faunal SCC populations; ○ Increased storm water run-off; ○ Compacted soils limiting the re-establishment of natural vegetation; and ○ Increased risk of erosion in areas left disturbed. 		
Impact Source(s)		<ul style="list-style-type: none"> • Increased risk of faunal collisions with vehicles; • Altered faunal SCC movement patterns and habitat utilisation in the local area; • Long term impacts to faunal SCC of the footprint area, including lost opportunity to re-establish a semblance of faunal SCC habitat and species activity in unison with the operation of the solar facility; and • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	2	1
		Impact Extent (E)	2	2
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 20
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	2	1
		Impact Extent (E)	1	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	4	4
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 30	(-) 18
		Environmental Significance Rating	Low	Low
		Impact Magnitude (M)	3	1



Freshwater Ecosystems	Linear development: - Access roads; and - Interconnected OHPL.	Impact Extent (E)	1	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	5	4
		Probability of Occurrence (P)	1	2
		Significance (S)	(-) 24	(-) 18
		Environmental Significance Rating	Low	Low
CUMULATIVE IMPACTS	According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.			
CONFIDENCE	High			
MITIGATION MEASURES	<ul style="list-style-type: none"> • Ongoing alien and invasive plant monitoring and clearing/control should take place throughout the operational and maintenance phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas which may alter the suitability of the habitat to faunal species; • Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which comply with legal standards; • All footprints should be rehabilitated as close to their pre-development conditions as possible, with indigenous vegetation re-instated to support faunal recolonisation of the area; • 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); • Edge effect control needs to be implemented to prevent further degradation and potential loss of faunal SCC habitat outside of the proposed development footprint; • Where bare soils are left exposed as a result of construction activities, they should be immediately rehabilitated. Rehabilitated efforts should continue to be monitored throughout the operational phase, until natural processes will allow the ecological functioning and biodiversity of the area to be re-instated; • Rehabilitation must proceed in accordance with the approved rehabilitation plan and must aim to achieve more than rehabilitation but must ensure that the veld is restored, at least, to a point where natural processes can re-instate the environment to a state that has the majority of the elements of biodiversity can be re-instated and supported; • Rehabilitation efforts must be implemented for a period of at least five years after decommissioning and closure; • It is recommended that vegetation regrowth during the Operational and Maintenance Phases must be promoted while appropriately maintained so as not to create a safety or production risk, as this will create habitat for faunal SCC and will aid in preventing soil erosion. 			



Table 13: Impact Assessment considering the impacts and mitigation surrounding the faunal habitat diversity during the Decommissioning Phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – faunal habitat and diversity	STATUS	NEGATIVE
Impact Description		<p>The most significant impact will occur with rehabilitating disturbed areas and re-establishing the herbaceous layer as part of the ongoing rehabilitation activities for the proposed Tourneé 2 Solar PV Park. Potential ineffective rehabilitation of exposed and impacted areas leading to vegetation succession and a possible reduction of faunal species habitat over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tourneé 2 Solar PV Park. Potential poor management and failure to monitor rehabilitation efforts, leading to:</p> <ul style="list-style-type: none"> ○ Landscapes being left fragmented, resulting in reduced migration capabilities of faunal SCC species, isolation of faunal SCC populations; ○ Increased storm water run-off; ○ Compacted soils limiting the re-establishment of natural vegetation; and ○ Increased risk of erosion in areas left disturbed. 		
Impact Source(s)		<ul style="list-style-type: none"> • Increased risk of faunal collisions with vehicles; • Long term impacts to faunal species assemblages of the footprint area, including lost opportunity to re-establish a semblance of faunal habitat and species activity in unison with the operation of the solar facility; • Possible increased fire frequency during rehabilitation activities; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	3	3
		Impact Extent (E)	1	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 40	(-) 30
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	3
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 20
		Environmental Significance Rating	Moderate	Low
Transformed Habitat		Impact Magnitude (M)	3	2
		Impact Extent (E)	2	1



	PV facility and associated infrastructure	Impact Reversibility (R)	3	1
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 44	(-) 21
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	2
		Impact Extent (E)	1	2
		Impact Reversibility (R)	1	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	3	3
		Significance (S)	(-) 24	(-) 30
Environmental Significance Rating	Moderate	Low		
CUMULATIVE IMPACTS	According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.			
CONFIDENCE	High			
MITIGATION MEASURES	<ul style="list-style-type: none"> • All infrastructure should be removed and the footprint areas rehabilitated in accordance with the rehabilitation and post-closure plan. Rehabilitation efforts must be continuously monitored for a period of at least 5 years after decommissioning and closure, or until an acceptable level of habitat and biodiversity re-instatement has occurred, in such a way as to ensure that natural processes and vegetative succession will lead to the re-establishment of the habitat conditions which are analogous with the desired post-closure land use; • Edge effects and AIP proliferation, which may affect adjacent or sensitive habitat, need to be strictly managed; • Any natural areas beyond the direct authorised footprint, which have been affected by the decommissioning activities, must be rehabilitated using indigenous species; • No hunting or trapping of faunal species to occur; • Should any snakes be encountered during operations, a suitably qualified staff member or snake remover should be contacted to remove the snake, should it not move off by itself. No snakes or other faunal species are to be killed; • No illicit fires by staff allowed; and • Adequate post-closure safety precautions need to be taken to avoid failure of pillar structures potentially resulting in subsidence and/or collapse which will impact aboveground faunal habitat and species. 			



Table 14: Impact Assessment considering the impacts and mitigation surrounding the faunal SCC during the Decommissioning Phase of the 150 MW Tourneé 2 Solar PV Park development.

IMPACT NATURE		Impact – faunal SCC	STATUS	NEGATIVE
Impact Description		<p>The most significant impact will occur with rehabilitating disturbed areas and re-establishing the herbaceous layer as part of the ongoing rehabilitation activities for the proposed Tourneé 2 Solar PV Park. Potential ineffective rehabilitation of exposed and impacted areas leading to vegetation succession and a possible reduction of faunal SCC habitat over the long-term. Poorly implemented and monitored AIP Management programme leading to the reintroduction and proliferation of AIP species within the proposed Tourneé 2 Solar PV Park. Potential poor management and failure to monitor rehabilitation efforts, leading to:</p> <ul style="list-style-type: none"> ○ Landscapes being left fragmented, resulting in reduced migration capabilities of faunal SCC species, isolation of faunal SCC populations; ○ Increased storm water run-off; ○ Compacted soils limiting the re-establishment of natural vegetation; and ○ Increased risk of erosion in areas left disturbed. 		
Impact Source(s)		<ul style="list-style-type: none"> • Increased risk of faunal collisions with vehicles; • Long term impacts to faunal SCC of the footprint area, including lost opportunity to re-establish a semblance of faunal SCC habitat and species activity in unison with the operation of the solar facility; and • Possible increased fire frequency during operational and maintenance activities; and • Proliferation of AIP species that colonise disturbed areas. 		
Habitat Unit	Driver / activity	Parameter	Pre - mitigation (Score)	Post - mitigation (Score)
Grassland Habitat	PV facility and associated infrastructure	Impact Magnitude (M)	3	2
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	1
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 44	(-) 21
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	2
		Impact Extent (E)	2	1
		Impact Reversibility (R)	3	3
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	3	2
		Significance (S)	(-) 33	(-) 18
		Environmental Significance Rating	Moderate	Low
		Impact Magnitude (M)	3	2



Transformed Habitat	PV facility and associated infrastructure	Impact Extent (E)	2	1
		Impact Reversibility (R)	3	1
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	4	3
		Significance (S)	(-) 44	(-) 21
		Environmental Significance Rating	Moderate	Low
	Linear development: - Access roads; - Internal roads; and - Interconnected OHPL.	Impact Magnitude (M)	3	2
		Impact Extent (E)	1	1
		Impact Reversibility (R)	1	1
		Impact Duration (D)	3	3
		Probability of Occurrence (P)	3	3
		Significance (S)	(-) 24	(-) 21
	Environmental Significance Rating	Moderate	Low	
CUMULATIVE IMPACTS	According to the South African Renewable Energy EIA Application Database (REEA, 2022) there is only one application for renewable energy facilities (wind and solar) within a 30 km radius of the Tourneé 2 Solar PV Park, namely: 65.9 MW Tutuka Photovoltaic (PV) Energy Facility and Its associated Infrastructure on portion 4, 10, 11 and 12 of the Farm Pretorius Vley 374 is near Standerton within Lekwa, Mpumalanga Province. Applicant: Eskom Holdings SOC Limited. Status: Approved. DFFE Ref: 14/12/16/3/3/2/754. This indicates that the larger region has been earmarked for renewable energy facilities, which may alter the landscape character. Vegetation clearing due to Tourneé 2 Solar PV Park will be at a local extent and no significant faunal habitat loss will be present on a regional level.			
CONFIDENCE	High			
MITIGATION MEASURES	<ul style="list-style-type: none"> • Ensure footprints remain as small as possible and that no footprint creep/edge effects occur; • Ensure that no trapping and or hunting occur on site; and • Ensure no run-away fires occur that may further impact upon or degrade faunal habitat. 			



6.2 Impact Discussion

The perceived impact significance of the proposed Tourneé 2 Solar PV Park (prior to mitigation) on faunal habitat, diversity, SCC and SCC ranges from high to low significance impacts. Following mitigation, impacts can be reduced accordingly for the most part. It is noted that some impacts, such as vegetation clearance in the footprint areas, cannot be significantly reduced, as such clearance is required for the installation of the PV arrays. Increased impact significance prior to mitigation is largely based on the assumption that mitigation measures will not be implemented, that areas outside of the proposed development footprint may be cleared/disturbed and that mitigation measures as stipulated won't be suitably implanted.

6.2.1 Impact on Faunal Habitat and Diversity

The proposed activities will impact on the habitat units identified on site to varying degrees, as depicted in the below table.

Table 15: Breakdown of the extent of habitat units impacted within the Tourneé 2 Solar PV Park.

Habitat Unit	Proposed infrastructure	Extent of habitat units impacted by proposed activities (ha)
Grassland Habitat	Internal roads	3,30
	Access road	0,48
	Facility substation & Eskom collector station	1,50
	Cement batching	3,01
	BESS	4,01
	O&M building	0,15
	Construction camp	0,50
	Paved area	0,25
	Laydown area	1,50
	Developable area	113,10
	Interconnecting OHPL	1,45
Transformed Habitat	Laydown area	1,50
	Internal roads	4,80
	Developable area	90,00
	Access roads	0,21
	Interconnecting OHPL	2,70

The most significant impact to faunal species in the proposed Tourneé 2 Solar PV Park will result from the clearance of vegetation within the solar farm footprint area during the construction phase. As a result of the loss of habitat, faunal species abundances and diversity will also be impacted upon, as the footprint area will no longer be able to support faunal species. As a result of the habitat loss and the construction of the proposed Tourneé 2 Solar PV Park and boundary fences, habitat connectivity and the movement of fauna through the Tourneé 2 Solar PV Park will also be impacted upon. The loss of habitat and connectivity may have a negative impact on faunal species in the region and consequently a potential decrease



in species carrying capacity. Decreased habitat connectivity may further impact on breeding populations, limiting gene flow (breeding) opportunities for faunal species inhabiting the natural areas around the solar farm footprint.

6.2.2 Impacts on Faunal SCC

A single SCC was confirmed for the proposed Tourneé 2 Solar PV Park, namely *Aonyx capensis* (Cape Clawless Otter). Several other faunal SCC POCs ranging from low to medium for the proposed Tourneé 2 Solar PV Park will utilise the Freshwater Ecosystem habitat as preferred habitat and throughfare to the larger area. The proposed layout of Tourneé 2 Solar PV Park is kept outside of the Freshwater Ecosystem habitat and proposed mitigations will keep the Freshwater Ecosystem habitat connected as a throughfare to the larger area. With the majority of these SCC likely to be associated with the solar farm footprint area. Vegetation clearance activities and earth works will place many SCC at risk, not only from a loss of habitat but also potential mortalities. This is of increased importance when considering invertebrate SCC, as many of these species are slow moving and live in burrows and under rocks. As such, these species are unlikely to be able to escape ahead of ground clearing activities. As such, it is essential that these species be actively searched for ahead of earth works. Where this is not feasible, as species are observed when vegetation clearance takes place, they are to be appropriately rescued and relocated. Provided that mitigation measures are implemented, the overall impact to faunal SCC as a result of the construction and operation activities is unlikely to significantly impact SCC populations in the region.

6.2.3 Probable Residual Impacts

Even with extensive mitigation, residual impacts on the receiving faunal ecological environment may still persist. The following points highlight the key residual impacts that have been identified:

- Long-term decline of faunal species diversity is highly likely to continue due to anthropogenic activities within the area which will likely increase in spatial extent over time;
- Long-term loss of faunal SCC abundance within the local area is highly likely to continue as a result of the negative impacts from anthropogenic activities and associated transformation which is likely to expand over the long term; and
- Disturbed areas are highly unlikely to be rehabilitated to baseline levels of ecological functioning and as such loss of faunal habitat, species diversity and faunal SCC will most likely be long term (life of operation).



6.2.4 Cumulative Impacts

Based on the general landscape and habitat within the project areas the site has the potential to host a moderately low to intermediate assemblage of fauna and potentially 4 SCC with one SCC namely *Aonyx capensis* (Cape Clawless Otter) confirmed. Three SCC have foraging and breeding habitat within the project footprint, as such, the development will result in the loss of breeding or foraging habitat for these species. One mammal SCC may potentially lose breeding habitat within the project areas as a result of the developments. While this SCC potentially breeds within the project areas it is not considered an important breeding locality for this species and the development is not likely to result in changes to breeding productivity, however, reductions in abundance within the project areas are likely. As a result of the extent over which the project area and other approved projects are proposed, faunal dispersal corridors are likely to be impacted. It is suggested that corridors (Figure 5), using e.g. Freshwater Ecosystem Habitat be retained and managed intact and remain open to the surrounding area as far as possible by only installing perimeter fences where necessary, having culverts in the border fence line or other mechanisms to improve connectivity. The increased human activity may however result in animals avoiding the broader area due to consistent human activity during the construction phase, however human activity will likely reduce during the operational phase.

The proposed activities will lead to the loss of general habitat for faunal species within the development footprints and lead to a reduction in the abundance of fauna and a potential for local reductions in SCC presence. This will lead to the displacement of faunal species currently inhabiting these areas, driving them out into the surrounding vegetated areas, leading to increased competition for territories and breeding sites. Moreover, there is likely to be a knock-on dispersal effect, leading to increased resource competition and possible increased mortality rates as the carrying capacity is impacted, resulting in a decreased species abundance, decreased breeding potential and possible further loss of species diversity in the region. The significance of this impact is however limited provided that impacts on Freshwater Ecosystem habitat are avoided.



7 CONCLUSION

Scientific Terrestrial Services (Pty) Ltd (STS) was appointed to conduct a biodiversity assessment as part of the environmental authorisation for the proposed development of the Tourneé 2 Solar PV Park near Thuthukani, Mpumalanga Province.

The Tourneé 2 Solar PV Park comprised of three habitat units, namely the Grassland habitat Transformed habitat and Freshwater Ecosystem habitat. The Grassland habitat provides habitat and food resources for the majority of faunal species and SCC observed on site. The Freshwater Ecosystem habitat supports several common faunal species, one mammal SCC was observed, and is used as an additional throughfare / movement corridor connecting areas in and outside of the Tourneé 2 Solar PV Park. In terms of sensitivities Grassland habitat is of intermediate sensitivity, Transformed habitat is of low sensitivity and the Freshwater Ecosystem habitat is of high sensitivity.

During the site assessment, a single SCC was observed within the Tourneé 2 Solar PV Park footprint, namely *Aonyx capensis* (Cape Clawless Otter). In addition to this species, several other SCC have a medium POC within the proposed Tourneé 2 Solar PV Park footprint area.

Impacts stemming from the construction of the proposed Tourneé 2 Solar PV Park will vary from high to low impacts on faunal biodiversity. Through the implementation of mitigation measures as stipulated in this report, along with sound environmental management, impacts can be reduced.



Table 16: Impact summary table for the proposed Tournée 2 Solar PV Park on faunal habitat and diversity.

		Pre-construction and Planning Phase		Construction Phase		Operational and Maintenance Phase		Decommissioning Phase	
		Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
Grassland Habitat	PV facility and associated infrastructure	Moderate	Low	High	Moderate	Moderate	Moderate	Moderate	Low
	Linear development	Low	Low	High	Moderate	Moderate	Low	Moderate	Low
Transformed Habitat	Associated Infrastructure Surface infrastructure	Low	Low	Low	Low	Moderate	Low	Moderate	Low
	Linear development	Low	Very Low	Low	Low	Moderate	Low	Moderate	Low
Freshwater Ecosystems	Linear development	NA	NA	Moderate	Low	Moderate	Low	NA	NA

Table 17: Impact summary for the proposed Tournée 2 Solar PV Park on faunal SCC

		Pre-construction and Planning Phase		Construction Phase		Operational and Maintenance Phase		Decommissioning Phase	
		Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation	Pre-mitigation	Post-mitigation
Grassland Habitat	PV facility and associated infrastructure	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
	Linear development	Moderate	Low	Moderate	Low	Low	Low	Moderate	Low
Transformed Habitat	PV facility and associated infrastructure	Low	Low	Low	Low	Low	Low	Moderate	Low
	Linear development	Low	Low	Low	Low	Low	Low	Moderate	Low
Freshwater Ecosystems	Linear development	NA	NA	Moderate	Low	Low	Low	NA	NA



Although the proposed development will likely impact on faunal species as a result of habitat loss, the habitats within the proposed Tourneé 2 Solar PV Park is not deemed to be of increased sensitivity for fauna, nor does it contain niche / unique habitat types or features that support range restricted SCC. From an IFC perspective the habitat on site cannot be defined as critical habitat except for the Freshwater Ecosystem habitat which has been avoided as part of the proposed development. Although several SCC faunal species are likely to occur within (permanently or temporarily) the proposed Tourneé 2 Solar PV Park, they are equally likely to be found in the same abundance in the surrounding natural areas. From a faunal ecological perspective, provided that all mitigation measures are implemented and that sound environmental management takes place, the proposed Tourneé 2 Solar PV Park are not expected to pose a significant threat to faunal populations in the region. As such, it is the opinion of the specialists that there is no clear reason why this development should not be authorised.

The objective of this study was to provide sufficient information on the faunal ecology of the area, together with other studies on the physical and socio-cultural environment, in order for the Environmental Assessment Practitioner (EAP) and the relevant authorities to apply the principles of Integrated Environmental Management (IEM) and the concept of sustainable development. The needs for conservation as well as the risks to other spheres of the biophysical and socio-cultural environment need to be compared and considered along with the need to ensure economic development of the country. This study provides the relevant information required in order to implement IEM and to ensure that the best long-term use of the ecological resources in the area of assessment will be made in support of the principle of sustainable development.



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APPENDIX A: Faunal Method of Assessment

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 near the Tournée 2 Solar PV Park may have an impact on faunal behaviour and in turn the rate of observations. In order to increase overall observation time within the Tournée 2 Solar PV Park, as well as increasing the likelihood of observing shy and hesitant species, Sherman and camera traps are usually placed within the Tournée 2 Solar PV Park. Sherman traps are often used to increase the likelihood of capturing and observing small mammal species, notably small nocturnal mammals.

Mammals

Mammal species were recorded during the field assessment with the use of visual identification, spoor, calls, dung, and other notable field signs. Specific attention was paid to mammal SCC as listed by the International Union for the Conservation of Nature (IUCN), the Mpumalanga province and NEMBA.

Avifauna

The Southern African Bird Atlas Project 2 database (<http://sabap2.adu.org.za/>) was compared with the recent field survey of avifaunal species identified in the Tournée 2 Solar PV Park. Field surveys were undertaken utilising direct observation and bird call identification techniques to accurately identify avifaunal species. Specific attention was given to avifaunal SCC listed on a regional and national level, as well as those identified by the International Union for the Conservation of Nature (IUCN).

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 International Union for the Conservation of Nature (IUCN).

Amphibians

Identifying amphibian species is done using 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 International Union for the Conservation of Nature (IUCN).

Invertebrates

Whilst conducting transects through the Tournée 2 Solar PV Park, all insect species visually observed were identified, and where possible photographs taken. A large net was used to sweep net and capture insects, by moving it through the grass. 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 International Union for the Conservation of Nature (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 within the Tournée 2 Solar PV Park.

Faunal Species of Conservation Concern Assessment

Prior to the site visit, a record of faunal 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, known distribution ranges and literature regarding SCC was used in conjunction with primary sources 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 Animal [and Plant] Protocols are described below²:

- **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 km² 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.

² 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>



- **Low**: Areas where no SCC are known or expected to occur.

NEMBA TOPS SPECIES AND NATIONALLY AND PROVINCIALY LISTED SCC

The Threatened or Protected Species (TOPS) Regulations (GN 255 of 2015) under Section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA), were taken into consideration as well as all species listed by the IUCN, the National Biodiversity Assessment 2019 and the relevant provincial conservation databases.

Throughout the fauna 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 faunal SCC is described as:

- **“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 A1: 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.



International Finance Corporation Performance Standard 6

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 CR and/or EN 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 CR or EN 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.

The table below serves to define the corresponding Guidance Note 6 corresponds to Performance Standard 6 identified for the specific project. General Notices identified for the specific project are summarised in the table below (Table A2).

Table A2: Descriptions of the project requirements to meet IFC Standards and corresponding Guidance Notes for additional information.

Guidance Notes	GN Description and project requirements
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	<p>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:</p> <ul style="list-style-type: none"> • 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.
GN109	Consider the mitigation of impacts on ecosystem services and the benefits that ecosystem services might bring to companies rather than on the economic valuation for such services. If PES schemes exist in or near areas where clients are doing business, the client should be aware of them in accordance with any existing regulatory framework and/or other ongoing initiatives.



APPENDIX B: Faunal SCC

The tables below list the faunal Species of Conservation Concern for Mpumalanga:

Table B1: List of mammal species (Cohen & Camacho, 2002a) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Species	MP 2003 Status	POC
Cape Mole Rat	<i>Georychus capensis</i>	EN	Low
Sclater's Golden Mole	<i>Chlorotalpa sclateri montana</i>	CR	Low
Highveld Golden Mole	<i>Amblysomus septentrionalis</i>	VU	Low
Rough-Haired Golden Mole	<i>Chrysospalax villosus rufopallidus</i>	CR	Low
Rough-Haired Golden Mole	<i>Chrysospalax villosus rufus</i>	EN	Low
Juliana's Golden Mole	<i>Neamblysomus julianae</i>	EN	Low
Robust Golden Mole	<i>Amblysomus robustus</i>	VU	Low
Meester's Golden Mole	<i>Amblysomus hottentotus meesteri</i>	VU	Low
Laminate Vlei Rat	<i>Otomys laminatus</i>	VU	Low
Peak-Saddle Horseshoe Bat	<i>Rhinolophus blasii empusa</i>	EN	Low
Lesser Long-Fingered Bat	<i>Miniopterus fraterculus</i>	VU	Low
Welwitsch's Hairy Bat	<i>Myotis welwitschii</i>	EN	Low
Short-Eared Trident Bat	<i>Cloeotis percivali australis</i>	EN	Low
Antbear	<i>Orycteropus afer</i>	NE	Low
Oribi	<i>Ourebia ourebi</i>	VU	Low
African Striped Weasel	<i>Poecilogale albinucha</i>	NE	Low
Wild Dog	<i>Lycaon pictus</i>	EN	Low
Pangolin	<i>Manis temminckii</i>	VU	Low
Aardwolf	<i>Proteles cristatus</i>	LC	Low
African Leopard	<i>Panthera pardus</i>	VU	Low
Natal Red Rock Rabbit	<i>Pronolagus crassicaudatus ruddi</i>	NE	Low
Serval	<i>Leptailurus serval</i>	NT	Low

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; NE=Not Evaluated

Table B2: List of reptile species (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

English Name	Species	MP 2003 Status	POC
Haacke's Flat Gecko	<i>Afroedura haackei</i>	EN	Low
Abel Erasmus Pass Flat Gecko	<i>Afroedura rupestris</i>	EN	Low
Mariepskop Flat Gecko	<i>Afroedura indet</i>	EN	DD
Rondavels Flat Gecko	<i>Afroedura rondavelica</i>	EN	Low
Forest/Natal Purpleglossed Snake	<i>Amblyodipsas concolor</i>	VU	Low
Lowveld Shield-nosed Snake	<i>Aspidelaps scutatus intermedius</i>	VU	Low
Dwarf Chameleon	<i>Bradypodion transvaalense complex</i>	VU	Low
Giant Girdled Lizard	<i>Cordylus giganteus</i>	VU	Low
Barberton Girdled Lizard	<i>Cordylus warreni barbertonensis</i>	NT	Low
Lebombo Girdled Lizard	<i>Cordylus warreni</i>	VU	Low
Swazi Rock Snake	<i>Inyoka swazicus</i>	VU	Low
Transvaal Flat Lizard	<i>Platysaurus orientalis</i>	NT	Low
Wilhelm's Flat Lizard	<i>Platysaurus wilhelmi</i>	VU	DD
Montane Burrowing Skink	<i>Scelotes mirus</i>	NT	Low
Breyer's Longtailed Seps	<i>Tetradactylus breyeri</i>	VU	Low
Harlequin Striped Snake	<i>Homoroselaps dorsalis</i>	NT	Low
Transvaal/Coppery Grass Lizard	<i>Chamaesaura aenea</i>	NT	Low

EN= Endangered; VU= Vulnerable; NT= Near Threatened; LC= Least Concern; DD = Data Deficient



Table B3: List of amphibian species (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

English Name	Species	MP 2003 Status	POC
Karoo Toad	<i>Bufo gariensis nubicolus</i>	VU	Low
Natal Ghost Frog	<i>Heleophryne natalensis</i>	VU	Low
Spotted Shovel-Nosed Frog	<i>Hemisis guttatus</i>	VU	Low
Yellow Striped Reed Frog	<i>Hyperolius semidiscus</i>	VU	Low
Plain Stream Frog	<i>Strongylopus wageri</i>	VU	Low
Giant Bullfrog	<i>Pyxicephalus adspersus</i>	VU	Medium
Greater Leaf-Folding Frog	<i>Afraxalus fornasini</i>	VU	Low
Whistling Rain Frog	<i>Breviceps sopranus</i>	VU	Low

VU= Vulnerable, MP 2003 = Mpumalanga State of the Environment Report (2003)

Table B4: List of invertebrate species (De Wet, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

English Name	Species	MP 2003 Status	POC
<i>Aloeides rossouwi</i>	Rossouw's Copper	EN	Low
<i>Aloeides barbarae</i>	Barbara's Copper	EN	Low
<i>Lepidochrysops swanepoeli</i>	Swanepoel's Blue	EN	Low
<i>Lepidochrysops jefferyi</i>	Jeffery's Blue	EN	Low
<i>Dingana fraterna</i>	Stoffberg Widow	EN	Low
<i>Metisella meninx</i>	Marsh Sylph	VU	Low
<i>Aloeides nubilis</i>	Cloud Copper	VU	Low
<i>Pseudagrion coeleste</i>	Catshead Sprite - Coenagrionidae	CR	Low
<i>Pseudagrion inopinatum</i>	Balinsky's Sprite - Coenagrionidae	VU	Low
<i>Pseudagrion newtoni</i>	Newton's Sprite - Coenagrionidae	VU	Low
<i>Pseudagrion sjoestedti pseudojoestedti</i>	Sjoestedt's Sprite - Coenagrionidae	CR	Low
<i>Aeshna ellioti usambarica</i>	Elliot's Hawker-Aeshnidae	VU	Low
<i>Phyllomacromia monoceros</i>	Unicorn Cruiser - Corduliidae	CR	Low

EN= Endangered; CR= Critically Endangered; VU= Vulnerable

Table B5: NEMBA: TOPS list (2007) of all faunal SCC that require a permit should they need to be relocated as a result of the proposed development and activities and its activities.

Scientific Name	Common Name
CRITICALLY ENDANGERED SPECIES	
REPTILIA	
<i>Caretta caretta</i>	Loggerhead Sea Turtle
<i>Dermochelys coriacea</i>	Leatherback Sea Turtle
<i>Eretmochelys imbricate</i>	Hawksbill Sea Turtle
AVES	
<i>Grus carunculatus</i>	Wattled Crane
<i>Hirundo atrocaerulea</i>	Blue Swallow
<i>Neophron percnopterus</i>	Egyptian Vulture
<i>Poicephalus robustus</i>	Cape Parrot
MAMMALIA	
<i>Bunolagus monticularis</i>	Riverine Rabbit
<i>Chrysospalax</i>	Rough-haired Golden Mole
ENDANGERED SPECIES	
REPTILIA	
<i>Chelonia mydas</i>	Green Turtle
<i>Cordylus giganteus</i>	Giant Girdled Lizard
<i>Lepidochelys olivacea</i>	Olive Ridley Turtle
<i>Psammobates geometricus</i>	Geometric Tortoise
AVIFAUNA	
<i>Anthropoides paradiseus</i>	Blue Crane
<i>Balearica regulorum</i>	Grey Crowned Crane



Scientific Name	Common Name
<i>Ephippiorhynchus senegalensis</i>	Saddle-billed Stork
<i>Gypaetus barbatus</i>	Bearded Vulture
<i>Gyps africanus</i>	White-backed Vulture
<i>Gyps coprotheres</i>	Cape Vulture
<i>Necrosyrtes</i>	Hooded Vulture
<i>Pelecanus rufescens</i>	Pink-backed Pelican
<i>Scotopelia peli</i>	Pel's Fishing Owl
<i>Torgos tracheliotus</i>	Lappet-faced Vulture
MAMMALIA	
<i>Amblysomus robustus</i>	Robust Golden Mole
<i>Damaliscus tunatus</i>	Tsessebe
<i>Diceros bicornis</i>	Black Rhinoceros
<i>Equus zebra</i>	Mountain Zebra
<i>Lycaon pictus</i>	African Wild Dog
<i>Neamblysomus gunningi</i>	Gunning's Golden Mole
<i>Ourebia ourebi</i>	Oribi
<i>Paraxerus palliatus</i>	Red Squirrel
<i>Petrodromus tetradactylus</i>	Four-toed Elephant-shrew
INVERTEBRATA	
<i>Colophon spp - species</i>	Stag Beetles
VULNERABLE SPECIES	
AVES	
<i>Trigonoceps occipitalis</i>	White-headed Vulture
<i>Aquila rapax</i>	Tawny Eagle
<i>Ardeotis kori</i>	Kori Bustard
<i>Ciconia nigra</i>	Black Stork
<i>Circaetus fasciolatus</i>	Southern Banded Snake Eagle
<i>Eupodotis caerulescens</i>	Blue Korhaan
<i>Falco fasciinucha</i>	Falcon
<i>Falco naumanni</i>	Lesser Kestrel
<i>Falco peregrinus</i>	Peregrine Falcon
<i>Geronticus calvus</i>	Bald Ibis
<i>Neotis ludwidgei</i>	Ludwig's Bustard
<i>Polemaetus bellicosus</i>	Martial Eagle
<i>Terathopius ecaudatus</i>	Bateleur
<i>Tyto capensis</i>	Grass Owl
MAMMALIA	
<i>Acinonyx jubatus</i>	Cheetah
<i>Chrysothalax trevelyani</i>	Giant Golden Mole
<i>Cricetomys gambianus</i>	Giant Rat
<i>Damaliscus pyrgorgus pyrgorgus</i>	Bontebok
<i>Dendrohyrax arboreus</i>	Tree Hyrax
<i>Hippotragus equinus</i>	Roan Antelope
<i>Pholidota temminckii</i>	Pangolin
<i>Neamblysomus julianae</i>	Juliana's Golden Mole
<i>Neotragus moschatus</i>	Suni
<i>Panthera leo</i>	Lion
<i>Panthera pardus</i>	Leopard
<i>Philantomba monticola</i>	Blue Duiker
INVERTEBRATA	
<i>Peripatopsis alba</i>	White Cave Velvet Worm
PROTECTED SPECIES	
AMPHIBIA	
<i>Pyxicephalus adspersus</i>	Giant Bullfrog
<i>Pyxicephalus edulis</i>	African Bullfrog
REPTILIA	



Scientific Name	Common Name
<i>Bitis gabonica</i>	Gaboon Adder
<i>Bitis schneideri</i>	Namaqua Dwarf Adder
<i>Bradypodion taeniabronchum</i>	Smith's Dwarf Chameleon
<i>Cordylus cataphractus</i>	Girdled Lizard
<i>Crocodylus niloticus</i>	Nile crocodile
<i>Python natalensis</i>	African Rock Python
AVES	
<i>Bucowus leadeateri</i>	Southern Ground-Hornbill
<i>Circus ranivorus</i>	African Marsh Harrier
<i>Neotis denhami</i>	Denham's Bustard
<i>Spheniscus</i>	Jackass Penguin
MAMMALIA	
<i>Atelerix frontalis</i>	South African Hedgehog
<i>Ceratotherium simum</i>	White Rhinoceros
<i>Connochaetes</i>	Black Wildebeest
<i>Crocuta crocuta</i>	Spotted Hyaena
<i>Felis nigripes</i>	Black-footed Cat
<i>Parahyaena brunnea</i>	Brown Hyaena
<i>Leptailurus serval</i>	Serval
<i>Loxodonta africana</i>	African elephant
<i>Lutra maculicollis</i>	Spotted-necked Otter
<i>Millivora capensis</i>	Honey Badger
<i>Raphicerus sharpei</i>	Sharpe's Grysbok
<i>Redunca</i>	Reedbuck
<i>Vulpes chama</i>	Cape Fox

INVERTEBRATA	
<i>Aloeides clarki</i>	Coega Copper Butterfly
<i>Ceratogyrus spp - All species</i>	Horned Baboon Spiders
<i>Echinodiscus bisperforatus</i>	Pansy Shell
<i>Dromica spp - All species</i>	Tiger Beetles
<i>Graphipterus assimilis</i>	Velvet Ground Beetle
<i>Hadogenes spp -species</i>	Flat Rock Scorpions
<i>Haliotis midae</i>	South African Abalone
<i>Harpactira spp - All species</i>	Common Baboon Spiders
<i>Ichneutoma - Aspecies</i>	Fruit Chafer Beetles
<i>Manticora spp - Aspecies</i>	Monster Tiger Beetles
<i>Megacephala asperata</i>	Tiger Beetle
<i>Megacephala regalis</i>	Tiger Beetle
<i>Nigidius auriculatus</i>	Stag beetle
<i>Oonotus adspersus</i>	Stag Beetle
<i>Oonotus interioris</i>	Stag Beetle
<i>Oonotus rex</i>	Stag Beetle
<i>Oonotus sericeus</i>	Stag Beetle
<i>Opisthacanthus spp - All species</i>	Creeping Scorpions
<i>Opisththalmus spp - All species</i>	Burrowing Scorpions
<i>Platychile pallida</i>	Tiger Beetle
<i>Prosopocoilus petitclerci</i>	Stag Beetle
<i>Prothyma guttipennis</i>	Tiger Beetle
<i>Pterinochilus spp - All species</i>	Golden Baboon Spiders

NL= Not Listed; EN= Endangered; CR= Critically Endangered; VU= Vulnerable; P = Protected (TOPS 2007); NT = Near Threatened



Species listed as protected under the Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA)

Table B6: Schedule 1 - SPECIALLY PROTECTED GAME (SECTION 4 (1) (a))

Common name	Scientific name
Elephant	<i>Loxodonta africana</i>
All species of rhinoceros	all species of the Family Rhinocerotidae

Table B7: Schedule 2 - PROTECTED GAME (SECTION 4 (1) (b))

Common name	Scientific name
AMPHIBIANS, REPTILES AND MAMMALS	
Bullfrog	<i>Pyxicephalus adspersus</i>
All species of reptiles excluding the water leguaan, rock leguaan and all species of snakes	All species of the Class Reptilia excluding <i>Varanus niloticus</i> , <i>Varanus exanthematicus</i> and all species of the Sub Order Serpentes
Riverine Rabbit	<i>Bungolagus monticularis</i>
Hedgehog	<i>Atelerix frontalis</i>
Samango Monkey	<i>Cercopithecus mitis</i>
Bushbaby	<i>Otolemur crassicaudatus</i>
Lesser Bushbaby	<i>Galago moholi</i>
Honey-Badger	<i>Mellivora capensis</i>
Pangolin	<i>Manis temminckii</i>
Aardwolf	<i>Proteles cristatus</i>
Cape Hunting Dog	<i>Lycaon pictus</i>
Brown Hyaena	<i>Hyaena brunnea</i>
Antbear	<i>Orycteropus afer</i>
Mountain Zebra	<i>Equus zebra</i>
Hartmann's Zebra	<i>Equus zebra hartmannae</i>
Hippopotamus	<i>Hippopotamus amphibius</i>
Giraffe	<i>Giraffa camelopardalis</i>
Nyala	<i>Tragelaphus angasi</i>
Red Duiker	<i>Cephalophus natalensis</i>
Blue Duiker	<i>Philantomba monticola</i>
Reedbuck	<i>Redunca arundinum</i>
Mountain Reedbuck	<i>Redunca fulvorufula</i>
Sable Antelope	<i>Hippotragus niger</i>
Roan Antelope	<i>Hippotragus equinus</i>
Black Wildebeest	<i>Connochaetes gnou</i>
Tsessebe	<i>Damaliscus lunatus</i>
Lichtenstein's Hartebeest	<i>Alcelaphus lichtensteinii</i>
Klipspringer	<i>Oreotragus oreotragus</i>
Oribi	<i>Ourebia ourebi</i>
Steenbok	<i>Raphicerus campestris</i>
Sharpe's Grysbok	<i>Raphicerus sharper</i>
Suni	<i>Neotragus moschatus</i>
Grey Rhebok	<i>Pelea capreolus</i>
Eland	<i>Taurotragus oryx</i>
Waterbuck	<i>Kobus ellipsiprymnus</i>
Cape Clawless Otter	<i>Aonyx capensis</i>
Spotted Necked Otter	<i>Lutra maculicollis</i>
BIRDS	
Any bird which is a wild animal, excluding a bird referred to in Schedule 3, and the -	
White Breasted Cormorant	<i>Phalacrocorax lucidus</i>
Reed Cormorant	<i>Phalacrocorax africanus</i>
Red-Eyed Turtle Dove	<i>Streptopelia semitorquata</i>
Cape Turtle Dove	<i>Streptopelia capicola</i>



Common name	Scientific name
Laughing Dove	<i>Streptopelia senegalensis</i>
all species of mousebirds	all species of the Family Colidae
Pied Crow	<i>Corvus albus</i>
Black Crow	<i>Corvus capensis</i>
Red-Eyed Bulbul	<i>Pycnonotus nigricans</i>
Black-Eyed Bulbul	<i>Pycnonotus barbatus</i>
Red-Winged Starling	<i>Onychognathus morio</i>
Cape Sparrow	<i>Passer melanurus</i>
Spotted-Backed Weaver	<i>Ploceus cucullatus</i>
Cape Weaver	<i>Ploceus capensis</i>
Masked Weaver	<i>Ploceus velatus</i>
Red-Billed Quelea	<i>Quelea quelea</i>
Red Bishop	<i>Euplectes orix</i>

Table B8: Schedule 4 - PROTECTED WILD ANIMALS (SECTION 4 (1) (d)).

Common name	Scientific name
Spotted hyaena	<i>Crocuta crocuta</i>
Cheetah	<i>Acinonyx jubatus</i>
Leopard	<i>Panthera pardus</i>
Lion	<i>Panthera Leo</i>
African buffalo	<i>Syncerus caffer</i>

Table B9: Schedule 5 - WILD ANIMALS TO WHICH THE PROVISIONS OF SECTION 33 APPLY

Common name	Scientific name
Water Monitor Lizard	<i>Varanus niloticus</i>
White throated rock monitor lizard	<i>Varanus exanthematicus</i>
All species of snakes	all species of the Sub Order Serpentes
Any bird which is a wild animal, but which is not game, excluding the ostrich	<i>Struthio camelus</i>
Chacma Baboon	<i>Papio ursinus</i>
Vervet Monkey	<i>Cercopithecus mitis</i>
All Dassies	Family: Procaviidae
All Mongooses	Family: Viverridae
Tree Squirrel	<i>Paraxerus cepapi</i>
Warthog	<i>Phacochoerus aethiopicus</i>
Serval	<i>Felis serval</i>
Civet	<i>Civettictis civetta</i>
Cape Fox	<i>Vulpes chama</i>
Side Striped Jackal	<i>Canis adustus</i>
All Genets	<i>Genetia</i> spp.
Springhare	<i>Pedetes capensis</i>
African Wild Cat	<i>Felis lybica</i>

Table B10: Schedule 7 - INVERTEBRATES (SECTION 35 (1)).

Common name	Scientific name
All species of baboon spiders belonging to the genera as referred	<i>Ceratogyrus</i> spp., <i>Harpactira</i> spp. and <i>Pterinochilus</i> spp.



APPENDIX C: Faunal Species List

Table C1: Mammal signs recorded during the field assessment.

Scientific Name	Common Name	Threat Status
<i>Canis mesomelas</i>	Black-backed Jackal	LC
<i>Aonyx capensis</i>	Cape Clawless Otter	NT
<i>Sylvicapra grimmia</i>	Grey Duiker	LC
<i>Damaliscus pygargus phillipsi</i>	Blesbok	LC
<i>Antidorcas marsupialis</i>	Spingbuck	LC
<i>Hystrix africaeaustralis</i>	Porcupine	LC
<i>Cynictis penicillata</i>	Yellow mongoose	LC
<i>Rhodomys pumilio</i>	Four-striped grass mouse	LC

LC = Least concerned, NT = Near Threatened

Table C2 Reptiles species recorded during the field assessment.

Scientific name	Common name	Threat Status
<i>Psammophylax rhombeatus</i>	Rhombic Skaapsteker	LC

LC = Least Concern

Table C3. Amphibians recorded during the field assessment.

Scientific Name	Common Name	Threat Status
<i>Amietia delalandii</i>	Common River Frog	LC

LC = Least Concern

Table C4: Invertebrates recorded during the field assessment.

Scientific Name	Common Name	Threat Status
<i>Telchinia serena</i>	Dancing Acraea	LC
<i>Gryllus bimaculatus</i>	(Common Garden Cricket)	NYBA
<i>Tmetanotax sp</i>	Burrowing Grasshopper	NYBA
<i>Agonoscelis versicoloratus</i>	Sunflower Seed Bug	NYBA
<i>Sphodromantis gastrica</i>	Common Green Mantid	NYBA
<i>Ochrophlebia cafra</i>	Grasshopper	NYBA
<i>Junonia orithya madagascariensis</i>	African Blue Pansy	LC
<i>Precis archesia archesia</i>	Garden Inspector	LC
<i>Vanessa cardui</i>	Painted Lady	LC
<i>Apis mellifera</i>	Honey Bee	LC
<i>Junonia hierta</i>	Yellow Pansy	LC
Genus <i>Lycus</i>	Netwing Beetles	NYBA
<i>Africallagma glaucum</i>	Swamp Bluet	LC
<i>Trithemis arteriosa</i>	Red-veined Dropwing	LC
<i>Porphyronota hebraea ssp. hebraea</i>	Common Marbled Fruit Chafer	NYBA
<i>Maura rubroornata</i>	Red-adorned Grasshopper	NYBA
Family Mantidae	Mantids	NYBA
<i>Papilio demodocus</i>	Citrus Swallowtail	LC
<i>Cyligramma latona</i>	Creamstriped Owl	LC
<i>Anoplolepis custodiens</i>	Large Pugnacious Ant	NYBA

LC = Least Concern, NYBA = Not yet been assessed



Table C6. Arachnids recorded during the field assessment.

Scientific Name	Common Name	Threat Status
<i>Thanatus sp</i>	False Crab Spider	NYBA

NYBA = Not yet been assessed

