TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED KAREERAND BESS, NORTH WEST PROVINCE

Prepared for:

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Authors

Tarryn Martin (Botanical Specialist) (*Pri. Sci. Nat* 008745)

Tarryn has over ten years of experience working as a botanist, nine of which are in the environmental sector. She has worked as a specialist and project manager on projects within South Africa, Mozambique, Lesotho, Zambia, Tanzania, Cameroon, Swaziland and Malawi. The majority of these projects required lender finance and consequently met both in-country and lender requirements.

Tarryn has extensive experience writing botanical impact assessments, critical habitat assessments, biodiversity management plans, biodiversity monitoring plans and Environmental Impact Assessments to International Standards, especially to those of the International Finance Corporation (IFC). Her experience includes working on large mining projects such as the Kenmare Heavy Minerals Mine, where she monitored forest health, undertook botanical impact assessments for their expansion projects and designed biodiversity management and monitoring plans. She has also project managed Environmental Impact Assessments for graphite mines in northern Mozambique and has a good understanding of the Mozambique Environmental legislation and processes.

Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C3 and C4 Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa.
Tarryn is a professional member of the South African Council for Natural Scientific Professionals (since 2014).

Amber Jackson (Faunal Specialist) (*Cand. Nat. Sci)*

Amber has over ten years' experience in environmental consulting and has managed projects across various sectors including mining, agriculture, forestry, renewable energy, housing, coastal and wetland recreational infrastructure. Most of these projects required lender finance and therefore met both in-country, lender and sector specific requirements.

Amber completed the IFC lead and Swiss funded programme in Environmental and Social Risk Management course in 2018. The purpose of the course was to upskill Sub-Saharan African environmental consultants to increase the uptake of E&S standards by Financial Institutions.

Amber specialises in terrestrial vertebrate faunal assessments. She has conducted large scale faunal impact assessments that are to international lender's standards in Mozambique, Tanzania, Lesotho and Malawi. In South Africa her faunal impact assessments comply with the protocols for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity and follows the SANBI Species Environmental Assessment Guideline. Her specialist input goes beyond impact assessments and includes faunal opportunities and constraints assessments, Critical Habitat Assessments, Biodiversity related Management Plans and Biodiversity Monitoring Programmes.

Amber holds a BSc (Zoology and Ecology, Environment & Conservation) and BSc (Hons) in Ecology, Environment & Conservation from WITS University and an MPhil in Environmental Management from University of Cape Town. Amber's honours focused on the landscape effects on Herpetofauna in Kruger National Park and her Master's thesis focused on the management of social and natural aspects of environmental systems with a dissertation in food security that investigated the complex food system of informal and formal distribution markets.

Declaration of Independence

Tarryn Martin (Botanical Specialist)

- I, Tarryn Martin, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amended Environmental Impact Assessment Regulations, 2017;
- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Amber Jackson (Faunal Specialist)

- I, Amber Jackson, declare that, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Amended Environmental Impact Assessment Regulations, 2017;
- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
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- All the particulars furnished by me in this report are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Non-Technical Summary

Introduction

Kareerand BESS (Pty) Ltd ('the Applicant') is proposing the construction of the Kareerand Battery Energy Storage (BESS) Facility, consisting of a BESS and solar photovoltaic (PV) infrastructure located on Portion 3 of the Farm Kareerand No. 444, approximately 22 km east of Klerksdorp within the North West Province.

The Kareerand BESS facility will have a total development footprint of up to approximately 25 ha and will have a maximum export capacity of up to 77 MW. The development area is situated within the City of Matlosana Local Municipality and the JB Marks Local Municipality. The site is accessible via existing tarred and gravel roads to the north-east of the site. These existing gravel roads will be upgraded to a maximum width of 8m.

The proposed Kareerand BESS facility will include the following infrastructure:

- PV modules and mounting structures (up to 10 ha).
- Inverters and transformers.
- Solid State Battery Energy Storage System (BESS) (up to 10 ha).
- Site and internal access roads (up to 8m wide).
- Operation and Maintenance buildings including a gate house and security building, control center, offices, warehouses and workshops for storage and maintenance (up to 1 ha).
- Laydown areas (3 ha temporary and 1 ha permanent).
- A 132 kV facility substation (up to 1 ha).
- 33 kV cabling between the project components and the facility substation.

The project will also include Grid connection infrastructure consisting of:

- A 132 kV Eskom Switching Station (up to 1 ha).
- 132 kV powerline (up to 11.5 km long) connecting the Eskom switching station to the Hermes Main Transmission Substation (a grid connection corridor of 100m wide will be assessed to allow for environmental sensitivities and/or micro-siting).

The Grid connection infrastructure, although assessed cumulatively with the BESS, will be subject to a separate environmental application process administered by the provincial authority.

Methodology

A desktop assessment was undertaken prior to the site visit to determine whether there are any terrestrial biodiversity features within the site that are considered sensitive. This was followed by field survey undertaken during late spring (15 November 2023) to confirm the site sensitivity for the project area. The site sensitivity verification report determined that the project area was located within an area with a low to very low site ecological importance. As such, a Compliance Statement is sufficient for this project since only areas of low to very low sensitivity will be affected.

Results

There was evidence of one faunal species of conservation concern (SCC) (Spotted-necked Otter) listed as Vulnerable (VU) within the PAOI and a high likelihood of a further three SCC (one VU and two Near Threatened (NT)) occurring within the PAOI.

No plant SCC were recorded within the project area. Furthermore, the desktop analysis indicated that there are no plant SCC with a high likelihood of occurrence within the project area.

Two vegetation types were recorded within the project area; Rand Highveld Grassland listed as VU and Vaal Reefs Dolomite Sinkhole Grassland listed as Least Concern (LC). The BESS and a portion of the powerline is located within the Rand Highveld Grassland which is very degraded while portions of the powerline are located within degraded Vaal Reefs Dolomite Sinkhole Grassland.

Furthermore, according to the North West Biodiversity Sector Plan (2015), the footprint of the BESS and a portion of the EGI occur within a CBA 2 area and a small portion of the powerline also occurs within an ESA 1. The CBA layer for the North West Biodiversity Spatial Plan does not include the underlying reason why areas have been selected as CBAs, however, it does provide a broad overview on the categories that triggered the CBA status. Two categories (corridor and corridor node) triggering the CBA 2 status within the proposed project site were identified. Given how wide the corridor is in the area where the infrastructure is located, the functioning of the corridor can persist to the east and west of the project area and as such the functioning of the broader CBA and ESA will continue and are unlikely to be severely impacted by project activities.

The project site occurs within the Bushybend Private Nature Reserve. The site was declared a protected area by the landowner, likely to protect it from mining. Although there is game on the site, it is used to graze cattle and is not currently managed as a nature reserve.

The site does not fall within the 2011 National PAES but it does fall within a negotiated focus area identified in 2018 but not yet formalised. Although the placement of the infrastructure may increase habitat fragmentation and thus impact on the ecological corridor, the footprint of the proposed development is small enough that the impact is likely to be low to negligible.

Conclusions and Recommendations

Given that the overall SEI for the project area is low, impacts from project activities on the terrestrial biodiversity, fauna and flora are low to negligible. Management guidelines indicate that for area of low SEI, medium to high impacts are acceptable provided mitigation measures are implemented and for areas of very low SEI, development of medium to high impacts are acceptable and mitigation measures may not be required.

Recommended management actions that include mitigation measures to further reduce the impact of the project on the terrestrial biodiversity environment have been outlined in chapter 8. These recommendations must be included in the Environmental Management Plan and as a condition of authorisation.

Ecological Statement and Opinion of the Specialist

Given that the project area has a low to very low sensitivity, the specialists are of the opinion that the development can proceed, provided the recommendations contained in this report are implemented

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Glossary of Terms

Alien Invasive Species refers to an exotic species that can spread rapidly and displace native species causing damage to the environment

Biodiversity is the term that is used to describe the variety of life on Earth and is defined as "*the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems*" (Secretariat of the Convention on Biological Diversity, 2005).

Habitat Fragmentation occurs when large expanses of habitat are transformed into smaller patches of discontinuous habitat units isolated from each other by transformed habitats such as farmland.

Natural Habitat refers to habitats 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 function and species composition.

Project Area is defined as the area that will be directly impacted by project infrastructure such as the roads, solar panels and offices.

Project area of influence (PAOI) refers to the broader area around the project area that may be indirectly impacted by project activities.

Protected Area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values *(IUCN Definition 2008).*

Sensitive Species are species that are sensitive to illegal harvesting. As such, their names are obscured and listed as "Sensitive species #". As per the best practice guideline that accompanies the protocol and screening tool, the name of the sensitive species may not appear in any BAR or EIA report, nor any specialist reports released into the public domain.

Species of Conservation Concern (SCC) includes all species that are assessed according the IUCN Red List Criteria as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Data Deficient (DD) or Near Threatened (NT), as well as range-restricted species which are not declining and are nationally listed as Rare or Extremely Rare [also referred to in some Red Lists as Critically Rare] (SANBI, 2021).

Acronyms

ADU	Animal Demography Unit
CBA	Critical Biodiversity Area
CI	Conservation Importance
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and Environment
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EN	Endangered
EOO	Extent of Occupancy
FI	Functional Integrity
GIS	Geographical Information System
GN	Government Notice
IUCN	International Union for Conservation of Nature
LC	Least Concern
NEM:BA	National Environmental Management: Biodiversity Act
NT	Near Threatened
PAOI	Project Area of Influence
PNCO	Provincial Nature Conservation Ordinance
POSA	Plants of Southern Africa
QDS	Quarter Degree Square
RR	Receptor Resilience
SA	South Africa
SANBI	South African National Biodiversity Institute
SCC	Species of Conservation Concern
SEF	Solar Energy Facility
SEI	Site Ecological Importance
TOPS	Threatened and Protected Species
VU	Vulnerable

Specialist Check List

The contents of this specialist report complies with the legislated requirements as described in the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity, Plant and Animal Species (GN R. 320 of March 2020 and GN R1150 of 30 October 2020).

SPECIALIST REPORT REQUIREMENTS ACCORDING TO GN 1150			SECTION OF REPORT
5.1	The Terrestrial **Animal Species** Compliance Statement must contain, as a minimum, the following information:		
	5.3.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page 2 & 3; Appendix 2 & 3
	5.3.2	A signed statement of independence by the specialist;	Page 5
	5.3.3	A statement of the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 1.4 and 2.3
	5.3.4	A description of the methodology used to undertake the site sensitivity verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	Chapter 2
	5.3.5	The mean density of observations/ number of samples sites per unit area	Section 2.3 and Figure 2.4
	5.3.6	Where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	Chapter 8
	5.3.7	A description of the assumptions made and any uncertainties or gaps in knowledge or data; and	Section 1.4
	5.3.8	Any conditions to which the compliance statement is subjected.	Chapter 8 and 9
3.2	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.		

SPECIALIST REPORT REQUIREMENTS ACCORDING TO GN R. 320			SECTION OF REPORT
5.3	The **Plant Species** Compliance Statement must contain, as a minimum, the following information:		
	5.3.1	Contact details and relevant experience as well as the SACNASP registration number of the specialist preparing the compliance statement including a curriculum vitae;	Page 2 & 3; Appendix 2 & 3
	5.3.2	A signed statement of independence by the specialist;	Page 4
	5.3.3	A statement of the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 1.4 and 2.3
	5.3.4	A description of the methodology used to undertake the site survey and prepare the compliance statement, including equipment and modelling used where relevant;	Chapter 2
	5.3.5	Where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	Chapter 8
	5.3.6	A description of the assumptions made and any uncertainties or gaps in knowledge or data;	Section 1.4
	5.3.7	The mean density of observations/ number of samples sites per unit area17; and	Section 2.3 and Figure 2.4
	5.3.8	Any conditions to which the compliance statement is subjected.	Chapter 8 and 9
	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.		
SPECIALIST REPORT REQUIREMENTS ACCORDING TO GN R. 320			**SECTION OF REPORT**
4.1	The **Terrestrial Biodiversity** Compliance Statement must contain, as a minimum, the following information:		
	4.3.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Page 2 & 3; Appendix 2 & 3
	4.3.2	A signed statement of independence by the specialist;	Page 4 & 5
	4.3.3	A statement of the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 1.4 & 2.3
	4.3.4	A baseline profile description of biodiversity and ecosystems of the site;	Chapter 6
	4.3.5	A methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modelling used, where relevant;	Chapter 7
	4.3.6	In the case of a linear activity, confirmation from the terrestrial biodiversity specialist that, in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase;	Section 9.2.3
	4.3.7	Where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	Chapter 8
	4.3.8	A description of the assumptions made and any uncertainties or gaps in knowledge or data; and	Section 1.4
	4.3.9	Any conditions to which this statement is subjected.	Chapter 8 and 9

4.4	A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	

1. INTRODUCTION

1.1. Project Description

Kareerand BESS (Pty) Ltd ('the Applicant') is proposing the construction of the Kareerand Battery Energy Storage (BESS) Facility, consisting of a BESS and solar photovoltaic (PV) infrastructure located on Portion 3 of the Farm Kareerand No. 444, approximately 22 km east of Klerksdorp within the North West Province.

The Applicant is also proposing to upgrade the existing access road on Portion 3 of the Farm Kareerand No. 444, Portion 4 of the Farm Kareerand 444, Portion 16 of the Farm Kromdraai 420, Portion 17 of the Farm Kromdraai 420, Farm Umfula No. 575, Portion 20 of Farm Umfula No. 567 and Portion 56 of the Farm Kromdraai 420; and to construct new 132kV grid connection infrastructure on Portion 3 of the Farm Kareerand No. 444, Portion 15 of the Farm Kromdraai 443, Remainder of Portion 5 of Farm no. 422, Portion 6 of the Farm Buffelsfontein 443, Portion 3 of the Farm Kareerand 444, Portion 2 of the Farm Buffelsfontein 443, Portion 103 of the Farm Hartebeestfontein 422, Portion 38 of the Farm Hartebeestfontein 422, Portion 79 of the Farm Hartebeestfontein 422, Portion 8 of the Farm Hartebeestfontein 422, Portion 2 of the Farm Mapaiskraal No. 441, Portion 41 of the Farm Hartebeestfontein 422 and Portion 4 of the Farm Mapaiskraal 441.

The Kareerand BESS facility will have a total development footprint of up to approximately 25 ha and will have a maximum export capacity of up to 77 MW. The development area is situated within the City of Matlosana Local Municipality and the JB Marks Local Municipality. The site is accessible via existing tarred and gravel roads to the north-east of the site. These existing gravel roads will be upgraded to a maximum width of 8m.

The proposed Kareerand BESS facility will include the following infrastructure:

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The Grid connection infrastructure, although assessed cumulatively with the BESS, will be subject to a separate environmental application process administered by the provincial authority.

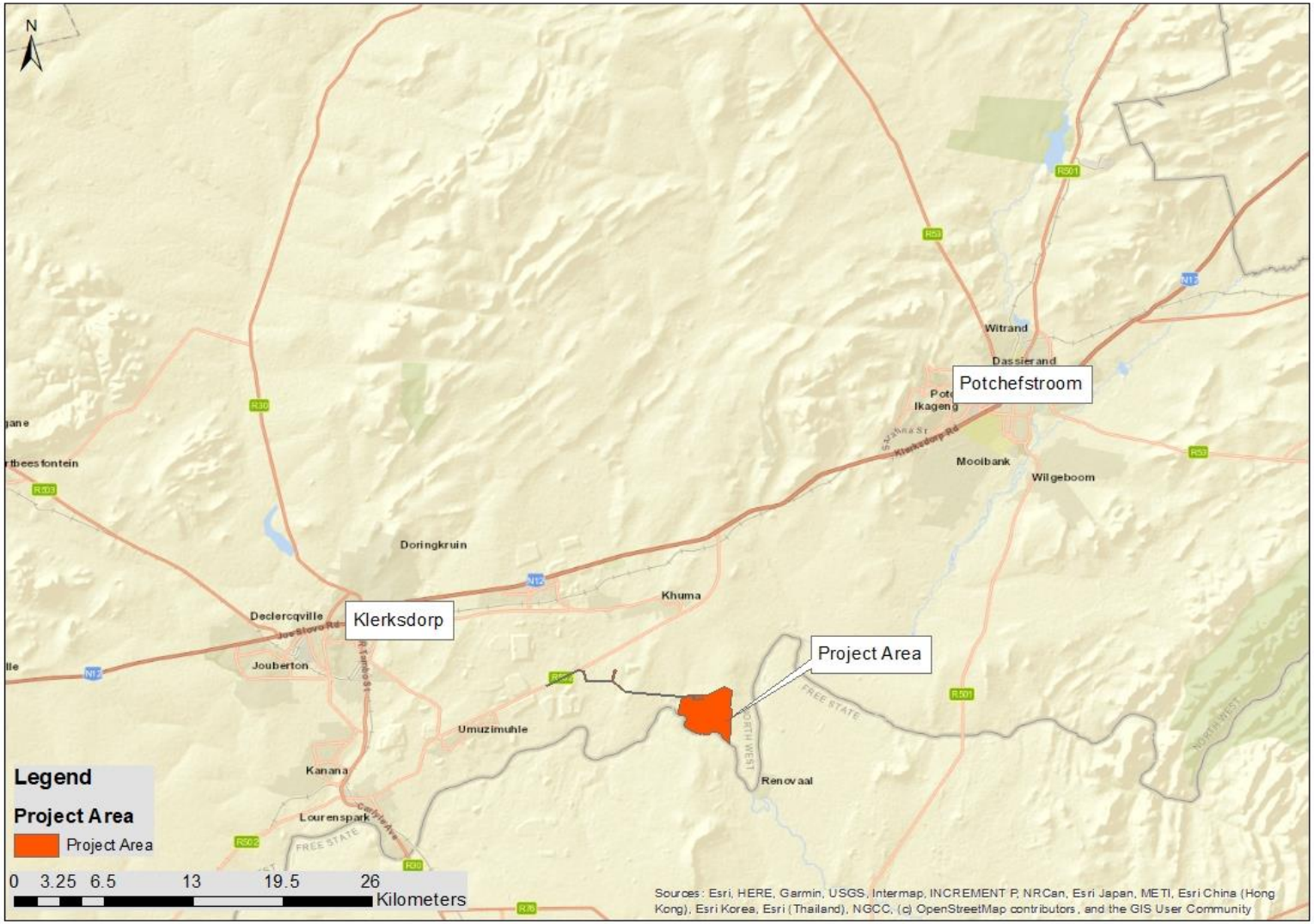

Figure 1.1: Location of the project area in relation to Kroonstad

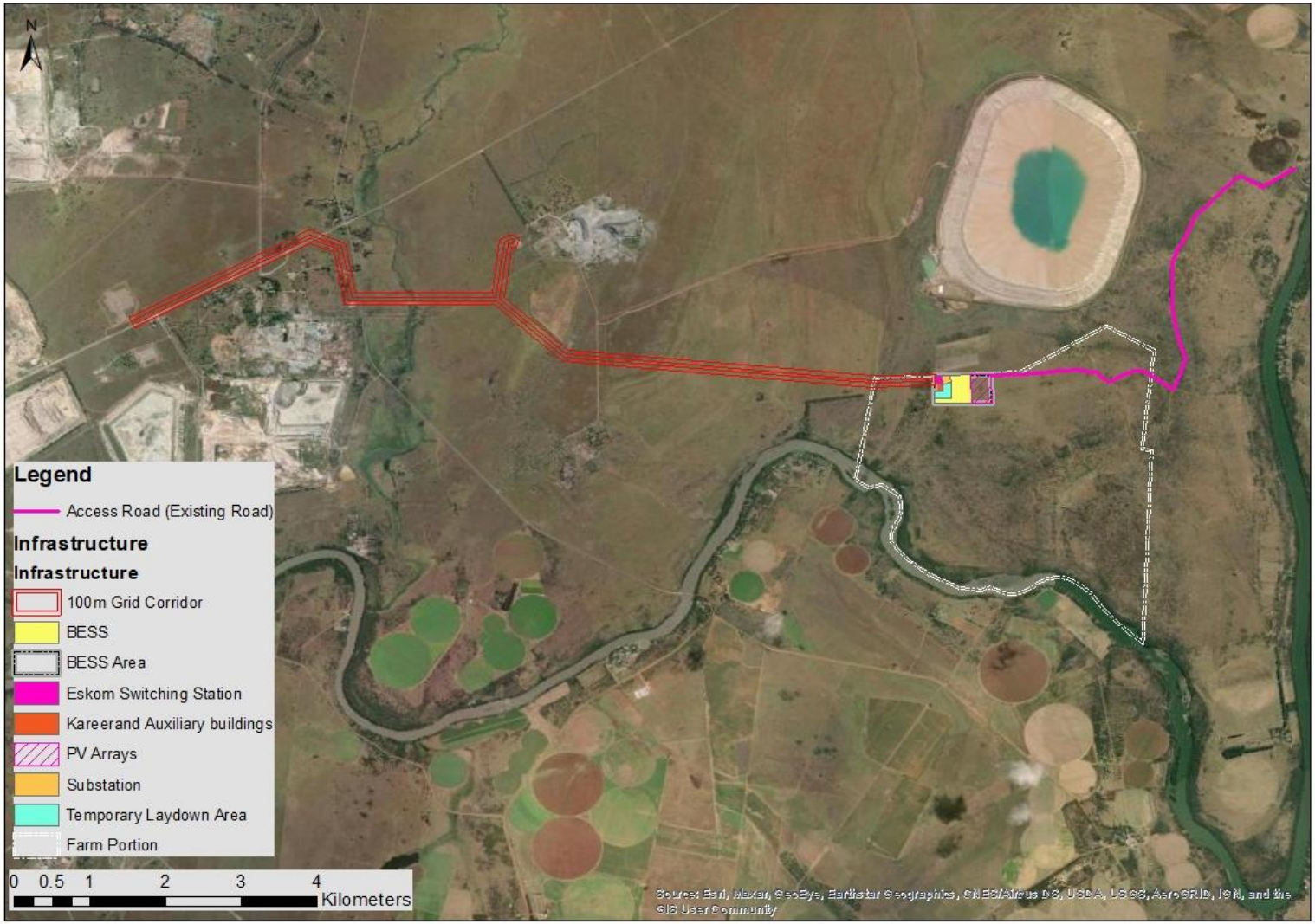

Figure 1.2: Infrastructure Map

1.2. Reporting Requirements

In terms of the Protocol for the Specialist Assessment and Minimum Reporting Content Requirements for Environmental Impacts on Terrestrial Biodiversity (GN R. 320 of 2020) and Terrestrial Animal and Plant Species (GN R. 1150), prior to the commencement of a specialist assessment, the current use of the land and the potential environmental sensitivity of the site under consideration as identified by the screening tool, must be confirmed by undertaking a site sensitivity verification. The results of the screening tool, together with the site sensitivity verification, ultimately determines the minimum report content requirements. Where the information gathered from the site sensitivity verification differs from the screening tool designation of 'very high' or 'high' and is found to be of a 'low' sensitivity, then a Compliance Statement must be submitted. However, if the site sensitivity verification confirms the findings of the Screening Report generated for this site, then a full Terrestrial Biodiversity Impact Assessment must be submitted as part of the Application for Environmental Authorisation (EA).

According to the Site Sensitivity Verification Report undertaken for this project, the Animal Species Theme, Plant Species Theme and Terrestrial Biodiversity Theme was found to be Low. According to the Species Environmental Assessment Guideline (SANBI, 2020), the SEI evaluated for each taxon/receptor should be combined into a single multi-taxon/receptor evaluation of SEI for the project area to allow the component authority to evaluate the SEI for the entire project area rapidly and at a single glance. As such, the highest overall SEI rating has been applied to each habitat type assessed in terms of the faunal and botanical sensitivity, which in this instance is Low. As such a Terrestrial Biodiversity Compliance Statement, including plants and animals, has been undertaken for the project area.

1.3. Scope, Purpose and Objectives

In accordance with GN R 1150, this report serves as the Terrestrial Biodiversity Compliance Statement, including terrestrial biodiversity, animals (excluding birds, bats and invertebrates), and plants and was prepared as part of the Scoping and Environmental Impact Assessment (S&EIA) for the proposed Kareerand BESS, North West Province.

The purpose of this report is to confirm the vegetation types, faunal habitat, and Species of Conservation Concern (SCC) present within the project area, assess the Site Ecological Importance (SEI) of the project area, assess the impact of the development on the terrestrial biological features present and, where feasible, provide mitigation measures to reduce the impacts including identifying no-go areas.

Based on the above, the objectives and Terms of Reference for the Terrestrial Ecological Impact Assessment are as follows:

- Undertake a desktop assessment of the site to determine its sensitivity and identify SCC (plants, amphibians, reptiles, mammals) that could be present within the project area.
- Undertake a field survey, to record the following information:
    - Species present
    - Identification of species that are either protected (TOPS and PNCO) or considered threatened (CR, EN, VU) on the South African Red Data List

    - Assess the level of degradation/ecological status of the site (i.e. intact, near natural, transformed).
- Assess the SEI of the project area using the sensitivity analysis outlined in the Species Environmental Assessment Guideline (SANBI, 2020).
- For areas of moderate and high sensitivity, assess the impact that the construction of the project infrastructure will have on the vegetation, faunal habitat, ecological processes and SCC.
- Where necessary, provide mitigation measures to reduce the significance of the impacts associated with the proposed development on the terrestrial biodiversity features of the project area.
- Provide a specialist statement/opinion regarding the acceptability of the proposed development in terms of the terrestrial biodiversity of the project area

1.4. Limitations and Assumptions

This report is based on current available information and, as a result, the following limitations and assumptions are implicit:

- SCC are difficult to find and may be difficult to identify, thus species described in this report do not comprise an exhaustive list. It is almost certain that additional SCCs are present. However, every effort was made to identify SCC present in the project area during the field survey. Furthermore, a desktop assessment to identify SCC that could occur within the project area was undertaken and the likelihood of occurrence, based on observed habitat availability, was determined. The field survey and desktop assessment provided sufficient information to confirm the presence/absence of SCC.
- Sampling was carried out at one stage in the annual or seasonal cycle. The survey was conducted in late spring (15 November 2023) when most species were flowering. However, some later flowering species may have gone undetected.
- This assessment includes plants, mammals (excluding bats), amphibians and reptiles. It does not include birds, bats or invertebrates. Birds have been assessed separately by specialists within this field.
- The faunal assessment is based on a field survey to assess available habitat present within the project area, coupled with a desktop assessment to determine the likelihood of occurrence of SCC.
- The assessment has been undertaken to meet the Protocol for the Specialist Assessment and Minimum Report Requirements for Environmental Impacts on Terrestrial Biodiversity (2020) and the Species Environmental Assessment Guidelines (2021).

2. METHODOLOGY

2.1. DFFE Screening Report

The DFFE screening report identifies environmental sensitivities for the project area. This is based on available desktop data and requires that a suitably qualified specialist verify the findings. Of relevance to this report is the animal species theme, plant species theme, and the terrestrial biodiversity theme (Table 2.1). Comment has been provided in the table below indicating how these themes have been assessed.

Table 2.1: Summary of DFFE screening report themes relevant to this study.

Theme	Sensitivity	Assessment
Animal Species Theme (Figure 2.1)	High • Likely presence of one sensitive bird species	The animal species theme has been categorised as high due to the likely presence of one bird species. Birds are assessed separately by an avifaunal specialist.
	Medium • Likely presence of Spotted-necked Otter *(Hydrictis maculicollis*)	One mammal species, the Spotted-necked Otter. The field survey assessed whether there was any suitable habitat present for the mammal species. The faunal assessment also identifies amphibians, reptiles and mammals that could occur within the project area and provides comment on the likelihood of occurrence of SCC (Refer to Chapter 4).
Plant Species Theme (Figure 2.2)	Medium • Likely presence of one sensitive plant species (Sensitive Species 691)	A desktop assessment that includes records from both Plants of Southern Africa (POSA) and iNaturalist databases was undertaken in conjunction with a field survey. For SCC that might occur within the project area, the likelihood of occurrence has been assessed based on distribution records and available habitat on site (Refer to Chapter 5).
Terrestrial Biodiversity Theme (Figure 2.3)	Very High • Critical Biodiversity Area 2 (CBA 2)	The field survey confirmed which vegetation types were present within the project area.

	• Ecological Support Area 1 (ESA 1) • National Protected Area Expansion Strategy (NPAES) • Bushybend Private Nature Reserve • Vulnerable Ecosystem – Rand Highveld Grassland	Furthermore, the implications of project activities on the CBA. Protected area and NPAES has been assessed in Chapter 6.

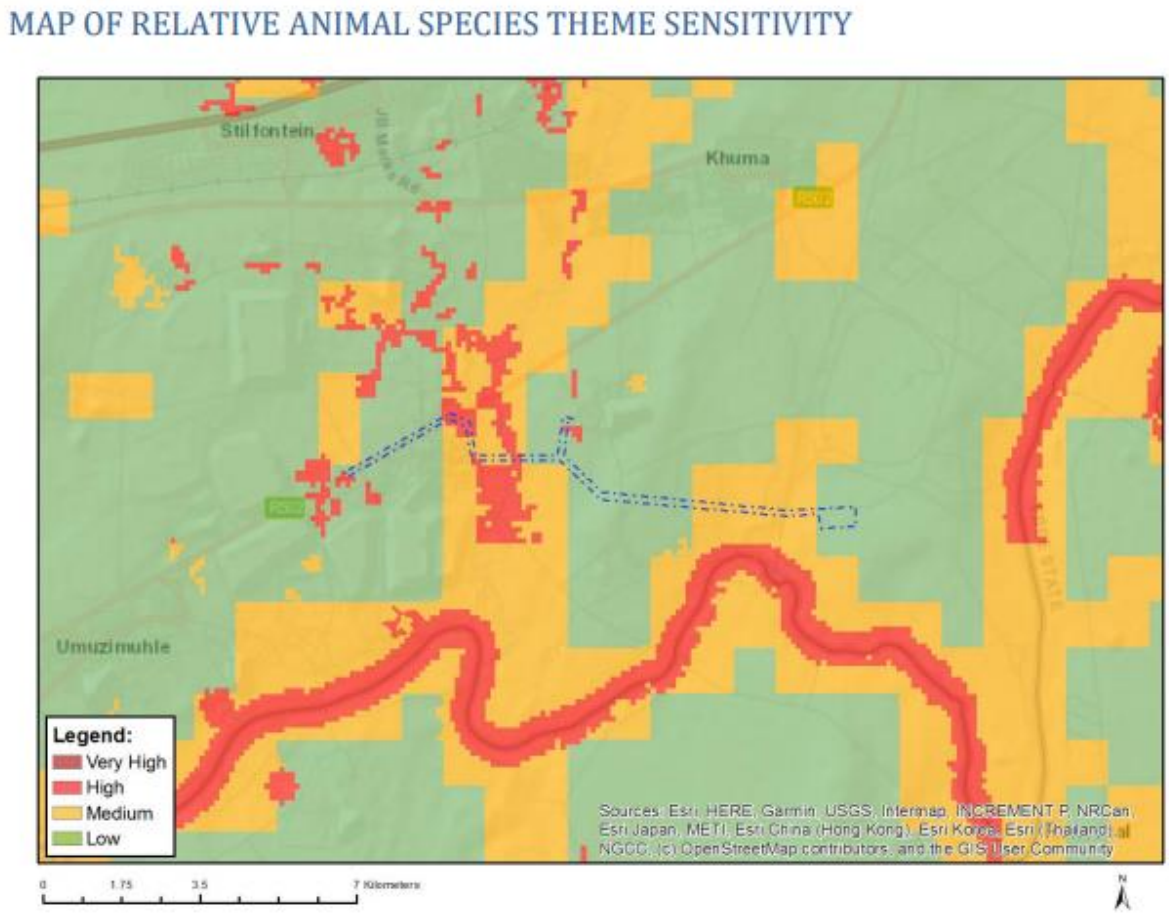

Figure 2.1: Screenshot from the DFFE screening Tool Report showing the Animal Species Theme sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY

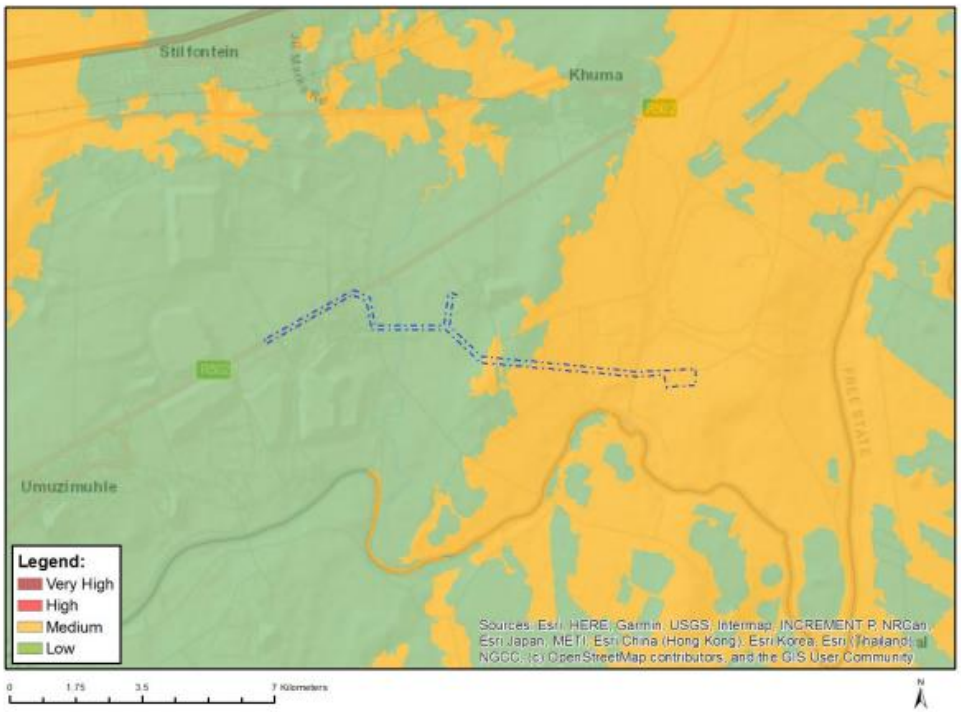

Figure 2.2: Screenshot from the DFFE screening Tool Report showing the Plant Species Theme sensitivity

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY

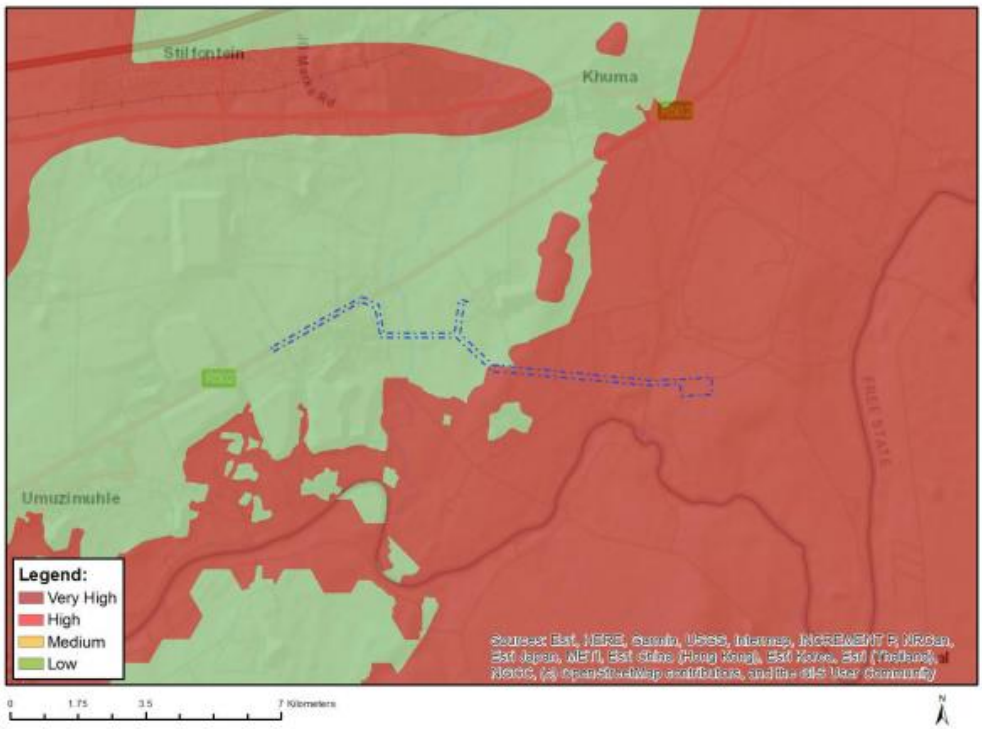

Figure 2.3: Screenshot from the DFFE screening Tool Report showing the Terrestrial Biodiversity Theme sensitivity

2.2. Desktop Assessment

2.2.1. Animal Species Theme

The known diversity of the vertebrate fauna (excluding birds and bats) in the project area was determined by a literature review. Species known from the region, or from adjacent regions, whose preferred habitat(s) were known to occur within the study area, were also included. Literature sources included:

- Amphibians –Du Preez & Carruthers (2017), FrogMap (FitzPatrick, 2023).
- Reptiles – Branch (1998), ReptileMap (FitzPatrick, 2023).
- Mammals – Stuart & Stuart (2014), MammalMap (FitzPatrick, 2023).
- IUCN, 2023.
- iNaturalist, 2023.

To establish which of those species identified in the literature review are SCC, the following sources were consulted:

- Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland (Bates *et al*., 2014).
- Atlas and Red List of Frogs of South Africa, Lesotho and Swaziland (Minter *et al*., 2004).
- Red List of Mammals of South Africa, Swaziland and Lesotho (Child, *et al.,* 2016).

2.2.2. Plant Species Theme

A species list was compiled for the site and the likelihood of occurrence assessed for species listed as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) and Near Threatened (NT). Key resources consulted include:

- The Plants of Southern Africa (POSA) database.
- iNaturalist.

Species threat status was checked against the South African Red Data List.

2.2.3. Terrestrial Biodiversity Theme

A desktop assessment was undertaken prior to the site visit to determine whether there are any terrestrial biodiversity features within the site that are considered sensitive. The vegetation types present within the site and, where applicable, key features driving the CBA status of the site were identified and confirmed during the field survey. Key resources consulted include:

- The DFFE screening report for the site (May 2023).
- The South African Vegetation Map (Mucina and Rutherford, 2018).
- The North West Biodiversity Spatial Plan (2015).
- The International Union for the Conservation of Nature (IUCN) Red List of Ecosystems for South Africa (SANBI, 2021).
- National Biodiversity Management: Biodiversity Act (NEM:BA) List of Threatened or Protected Species.

- The National Biodiversity Assessment (SANBI, 2018).

2.3. Field Survey

A field survey was undertaken during late spring (15 November 2023) to confirm the current land use, vegetation types and faunal habitat present. The information gathered from the site visit was sufficient to determine the sensitivity of the site. Figure 2.4 indicates the sample sites.

2.3.1. Terrestrial Biodiversity and Plant Species Theme

The purpose of the botanical survey was to assess the site-specific botanical state of the Project Area of Influence (PAOI) by recording the species present (both indigenous and alien invasive species), identifying sensitive plant communities such as vegetation associated with rocky outcrops, riparian areas or areas with species of conservation concern, and identifying the current land use.

The project area was driven and walked, and sample plots were analysed by determining the dominant species in each plot, as well as any alien invasive species and potential SCC occurring within the plots (Figure 2.1). Each sample plot was sampled until no new species were recorded. Vegetation communities were then described according to the dominant species recorded from each type, and these were mapped and assigned a sensitivity score.

2.3.2. Animal Species Theme

The purpose of the faunal survey was to determine the types of faunal habitats present within the project area supplemented with a desktop assessment to determine the likelihood of occurrence of SCC present within available habitat. Faunal habitat within the project area was recorded and mapped by the faunal specialist which provided sufficient information to draw conclusions on the likelihood of occurrence of SCC.

2.4. Site Sensitivity Assessment

The Species Environmental Assessment Guideline (SANBI, 2021) was applied to assess the Site Ecological Importance (SEI) of the project area. The habitats and the SCC in the project area were assessed based on their conservation importance, functional integrity and receptor resilience (Table 2.2). The combination of these resulted in a rating of SEI and interpretation of mitigation requirements based on the ratings.

The sensitivity map was developed using available spatial planning tools as well as by applying the SEI sensitivity based on the field survey.

Table 2.2: Criteria for establishing Site Ecological Importance and description of criteria.

Criteria	Description
Conservation Importance (CI)	*The importance of a site for supporting biodiversity features of conservation concern present e.g. populations of Threatened and Near-Threatened species (CR, EN, VU & NT), Rare, range-restricted species, globally significant populations of congregatory species, and areas of threatened ecosystem types, through predominantly natural processes.*
Functional Integrity (FI)	*A measure of the ecological condition of the impact receptor as determined by its remaining intact and functional area, its connectivity to other natural areas and the degree of current persistent ecological impacts.*
Biodiversity Importance (BI) is a function of Conservation Importance (CI) and the Functional Integrity (FI) of a receptor.	
Receptor Resilience (RR)	*The intrinsic capacity of the receptor to resist major damage from disturbance and/or to recover to its original state with limited or no human intervention.*
Site Ecological Importance (SEI) is a function of Biodiversity Importance (BI) and Receptor Resilience (RR)	

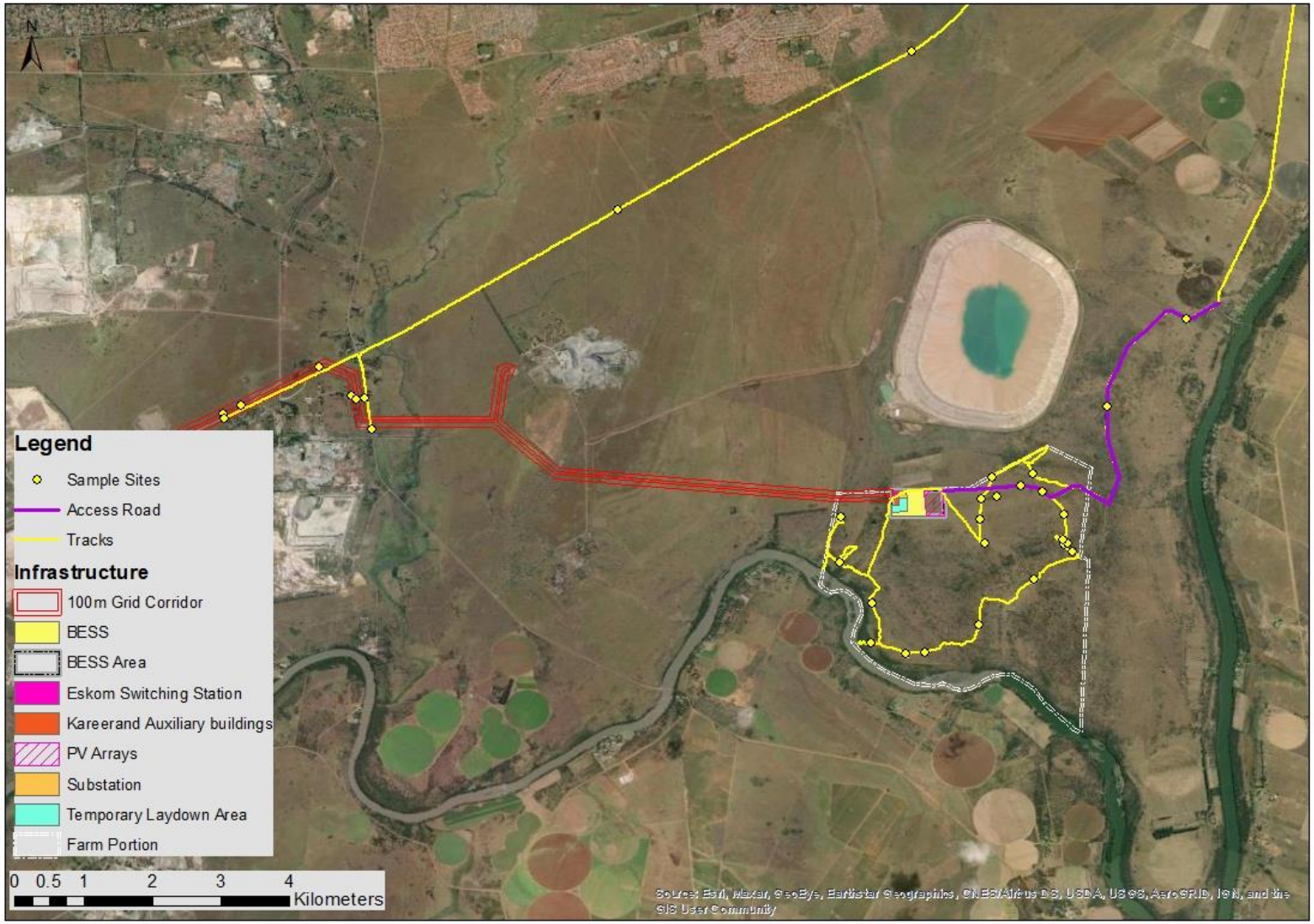

Figure 2.4: Map showing sample sites and tracks in relation to the project area.

3. BIOPHYSICAL DESCRIPTION OF THE PROJECT AREA

3.1. Environmental Factors Influencing the Vegetation Types and Habitats of the Project Area

The project area falls within the Grassland Biome which covers one third of South Africa's land surface, stretching from the Eastern Cape and KwaZulu-Natal, over the high escarpment and onto the central plateau (SANBI, 2013). Grasslands typically boast a high biodiversity, providing important habitat for a range of South Africa's rare, endangered, and endemic animal and plant species, with plant diversity of the grassland biome only second to that of the fynbos biome. This biodiversity underpins a range of ecosystem services which supports most of South Africa's important economic activities and millions of rural livelihoods (SANBI, 2013).

The distribution of this biome in South Africa is determined by the interplay of environmental variables, primarily climate (precipitation, temperature, frost), topography, geology, and soil (Mucina, *et al*., 2006). These environmental variables together with the ecological drivers, namely grazing and fire, influence the structure, species composition and primary productivity of vegetation types within this Biome (Mucina, *et al.,* 2006; SANBI, 2013).

SANBI (2013) have arranged the grassland vegetation types into five broad ecosystem groups based on their species composition, community structure, abiotic environmental factors, ecological characteristics, and management requirements. These include:

- Dry Highveld Grassland.
- Mesic Highveld Grassland (excluding the north-eastern escarpment areas of Mpumalanga).
- High-Altitude Grassland (including the 'Drakensberg Grasslands' as defined in Mucina & Rutherford, 2006, the escarpment along the KwaZulu-Natal/Free State border and the north-eastern escarpment areas of Mpumalanga).
- Sub-Escarpment Grassland.
- Coastal Grassland (grassy vegetation types embedded within the Indian Ocean Coastal Belt Biome).

The project area falls within the Dry Highveld Grassland ecosystem group. The biophysical characteristics that influence this vegetation type are discussed below.

Dry Highveld Grasslands occur at mid-altitudes of 1300-1600 m above sea level (asl) and occupy the central plateau of the country, extending over much of the Free State and into the North West Province, with small areas occurring in the Eastern Cape, Northern Cape and Gauteng. The climate of this area is temperate with summer rainfall and dry winters. The mean annual precipitation is low (400-550 mm) and there is a moderate to high frequency of frost (20 – 50 frost days per year) in winter. The topography is mostly flat to undulating broken by rocky ridges, small outcropping mountains, and river valleys in some areas. The underlying geology is dominated by sandstone and mudstone, the weathering of which gives rise to deep, red soils. Dolerite sheets are associated with shallower, stony soils and in the west, shallow red sands overlie layers of calcrete (SANBI, 2013).

Dry Highveld Grasslands are characterised by semi-arid sweetveld that is adapted to drought. Plants largely persist vegetatively from year to year, but new plants establish after drought from dormant seeds.

The project area is located within the north-western extent of the Grassland Biome at an elevation of ~1300 m asl and the topography of the project area is relatively flat with a gentle slope down to the south west where the Vaal River is situated. The average temperature is 18°C, but annual average highs reach 22.9°C and annual average lows drop to 10.6°C. The average annual precipitation is 610 mm, with the greatest rainfall occurring in December (107 mm). July is the driest month (4 mm).

3.2. Ecological Drivers

Ecological drivers are both abiotic and biotic factors that influence the structure, species composition, and the primary productivity of vegetation types. As mentioned above (Section 3.1), the most important ecological drivers in Dry Highveld Grassland ecosystems are grazing and fire:

- **Grazing** is the removal of above-ground plant matter by animals, either indigenous or domestic. It acts as an important agent of disturbance, introducing habitat diversity into the system both spatially and over time. Grazing stimulates biomass production through the removal of dead or dying plant biomass that limits new growth and breaks up the soil surface due to hoof action which allows better infiltration of water and nutrients (especially from animal dung) (SANBI, 2013).

- **Fire** is critical for maintaining the health of grassland ecosystems as it removes the dead and moribund plant material that shades out the next seasons growth; stimulates new growth which enhances primary productivity; releases nutrients and organic material back into the soil; and controls invasion of alien and indigenous woody plants which could cause a shift from grassland to Savanna or Woodland. Fire also increases the diversity of habitats within a landscape, for example recently burnt areas would be dominated by short grasses but areas that have not been burnt would be dominated by long grass. This mosaic of structurally differing habitats provides different habitats for different faunal species (SANBI, 2013).

Although fire plays an important role in Dry Highveld Grasslands, it is not as important as grazing. Because these ecosystems have a slow growth rate and therefore a slow recovery rate, the fuel load does not build up enough to result in regular, intense fires (SANBI, 2013).

It should be noted that over-grazing and the inappropriate use of fire can also have negative impacts on species composition and the overall status of the grassland ecosystem. These impacts are often apparent by the dominance of a few, unpalatable species (e.g., wire grasses such as *Aristida junciformis*), invasion by weedy species, and soil erosion. As such, it is important that the appropriate management best-practises are applied in remaining natural areas of Dry Highveld Grassland. These management best-practises are outlined below and have been extracted from the Grassland Ecosystem Guidelines (SANBI, 2013).

Burning/Fire:

Because rainfall and productivity are unpredictable, it is difficult to set out burning frequency rules for Dry Highveld Grassland. In general, and in the absence of more specific information, the following rules of thumb can be applied:

- These semi-arid systems should only be burnt when the build-up of the grass sward reaches a predetermined point, as measured with a pasture disk meter, and when there is a clear reason for burning.
- A burning interval of approximately 10 years should be applied.
- Burning should take place in late winter, and only in seasons that have been wet enough to ensure enough biomass to support an intense fire.

- Burning events should also be informed by an experienced botanist.

Grazing:

Small animals are as important as the bulk grazers in maintaining the vegetation structure, habitat diversity and nutrient cycles that give these systems their character. These grasslands should be managed to maintain the habitat diversity that allows a range of natural herbivores to persist. The natural grazing regime of these systems would have included grazing impacts at a wide range of spatial scales, ranging from individual grass plants grazed by small animals like insects or small rodents, through patches grazed by tortoises or solitary antelope, to large tracts of land grazed episodically by herds of springbok or buffalo.

It is important that these ecological drivers are considered during land use planning and development of the project as any land-use change that results in reduced ability to manage fire or grazing in remaining natural areas will have significant implications for grassland biodiversity (SANBI, 2013).

4. ANIMAL SPECIES THEME

4.1. Faunal Habitat Present

Habitats are defined in this study as the natural environment or place where faunal species *live, breed and/or forage*. Each habitat type has different environmental conditions and structure which influences a species' distribution range.

The habitat in the PAOI is primarily Grassland typically interspersed with micro-habitats such as seeps and woodlots with the Vaal River occurring 1.5km south of the project area.

Six faunal habitats were identified in this PAOI, namely:

- Grassland interspersed with trees
- Degraded Grassland (grazed by cattle)
- Rocky ridges
- Riparian Forest
- Drainage line with wetland
- Farm dams
- Vaal River

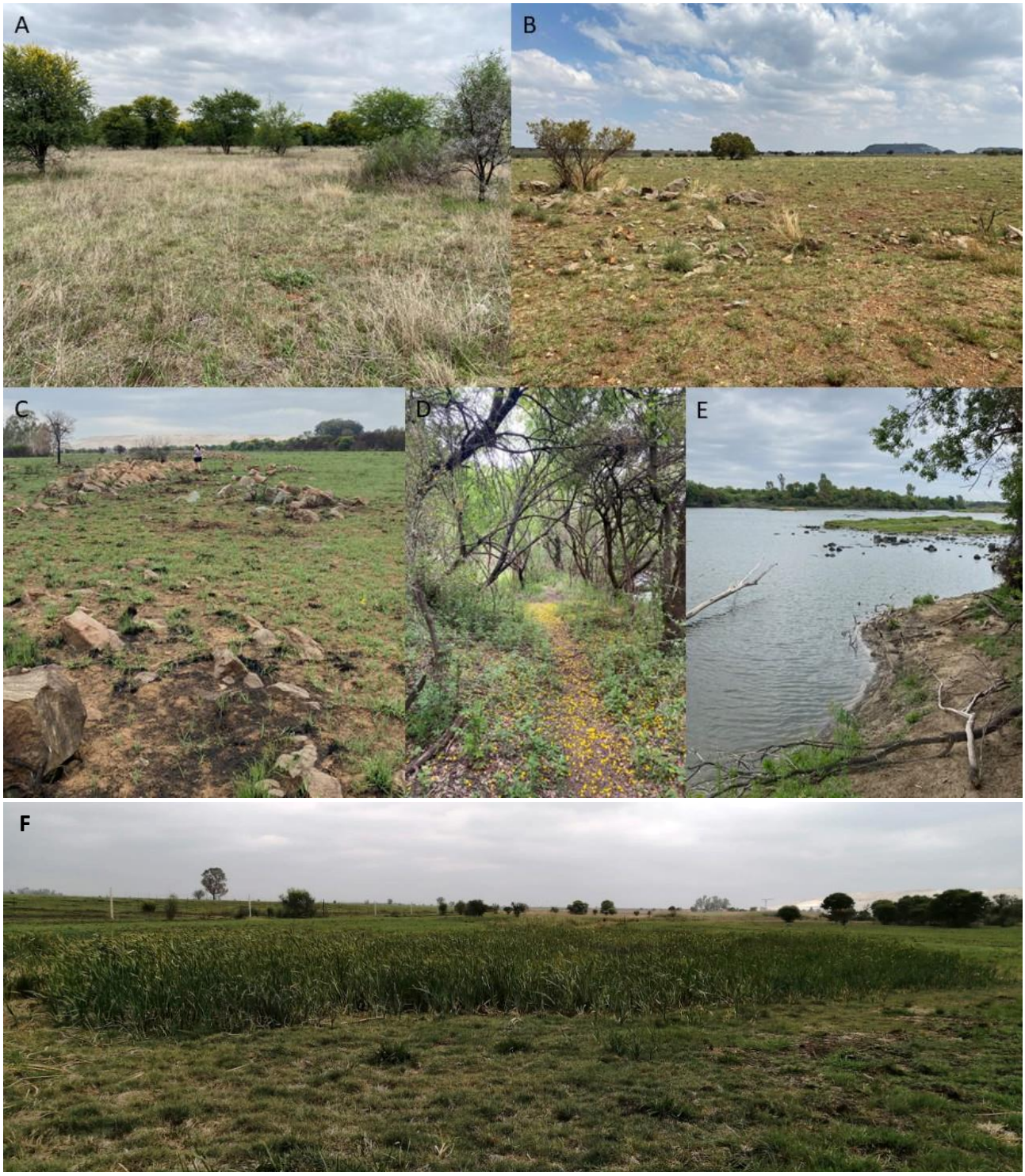

Figure 4.1: Photographs illustrating the faunal habitats present within the PAOI. A) Grassland, B) Degraded Grassland, C) Rocky ridge, D) Riparian Forest, E) Vaal River, F) Wetland.

4.2. Amphibians

The project area intersects with the distribution of nineteen(19) amphibian species, of which six (6) species have been recorded in the Quarter Degree Squares (QDS 2626DD) within which the project area occurs, and a further seven (7) were recorded in the general area (IUCN, 2023; iNaturalist, 2023; FitzPatrick, 2023) (Appendix 2). All amphibian species with a distribution that intersects the project area are classified as Least Concern (LC). Amphibian species are likely to occur within the project area but are not likely to solely rely on it.

It should be noted that the Giant Bull Frog (*Pyxicephalus adspersus*), which has a distribution range that includes the project area, was listed as nationally Near-Threatened (Minter, *et al*., 2004) but has since been downgraded to Least Concern by the IUCN SSC Amphibian Specialist Group (IUCN, 2013). However, this species is a protected species under TOPS Schedule B1 in terms of NEM:BA (Act 10 of 2004) and if on site, a permit would be required for their removal. Although not recorded in the area, it is possible this species occurs in the project area and is considered to have a moderate likelihood of occurrence. It inhabits seasonal shallow grassy pans, vleis and other rain filled depressions in open flat grassland in and remains buried 1m underground for much of the year (du Preez and Carruthers, 2017).

4.3. Reptiles

The project area intersects with the distribution fifty-four (54) reptile species of which thirteen (13) species have been recorded in the QDS (2626DD) within which the project area occurs, and a further twenty-three (23) were recorded in the general area (IUCN, 2023; iNaturalist, 2023; FitzPatrick, 2023) (Appendix 3). Four reptile species were observed onsite, the Common Girdled Lizard, Tropical House Gecko, Variable Skink and the Thin-tailed Legless Skink. The landowner also reports that there are many Puff Adders in the rockier areas and occasionally the garden. It is likely the property hosts many more species of snake, lizard and tortoises but as a species are not likely to solely rely on the project area.

All reptile species with a distribution that intersects the project area are classified as Least Concern (LC).

4.4. Mammals

The project area intersects with the distribution of seventy-seven (77) mammal species of which forty-four (44) have been recorded with the QDS (2626DD) within which the project area occurs and a further fourteen (14) were recorded in the general area (IUCN, 2023; iNaturalist, 2023; FitzPatrick, 2023).

The property where the project will be located hosts a number of a naturally occurring mammal species including Springbok, Gemsbok, Blesbok (n=±50), Kudu and Yellow Mongoose. The landowner reported seeing Nyala, Bushbuck and Steenbok on the property. There was evidence of Porcupine (scat and ring barking), Yellow or Slender Mongoose (burrows), Molerats (mounds), medium/large carnivore, likely Caracal (scat), Water Mongoose (scat) and Spotted-necked Otter (midden).

Fourteen (14) SCC, have a distribution that intersects the project area, including, one (1) endangered species, seven (7) Vulnerable (VU) species and six (6) Near Threatened (NT) species (Table 4.1). Species such as the Bontebok and Sable, have been excluded from the likelihood of occurrence assessment as they are unlikely to occur outside of protected areas and private reserves. Of the twelve (12) SCC likely to occur within the project area, four have a high likelihood of occurrence, four have a medium likelihood of occurrence and four have a low likelihood of occurrence.

The DFFE Screening Report classifies the Animal Species Theme of the project area as medium based on the possible occurrence of one SCC (Spotted-necked Otter) within the project area, this species was confirmed to occur within the PAOI by the presence of a midden. The midden was found within the drainage line vegetation in the northwestern portion of the property approximately 180m south of the proposed powerline corridor.

Figure 4.2: Thin-tailed Legless Skink (*Acontias gracilicauda*) and Gemsbok (Oryx gazella) recorded from the study area

Table 4.1: Mammal Species of Conservation Concern and their likelihood of occurrence within the study area.

*CR – Critical; EN -Endangered; VU – Vulnerable; NT -Near Threatened

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
Spotted-necked Otter *Hydrictis maculicollis*	VU	Protected	This species is widespread through Africa, occurring at altitudes of 0-2500m asl. Habitat requirements for this species include streams, rivers, lakes (natural & manmade) and open waters which are unpolluted and are not silted. Shelters along water edges with cover provided by boulders, reeds, long grass, dense bushes and overhanging trees. Feed predominantly on fish and occasionally crabs, frogs, insects (esp. dragonfly larvae) and birds.	Recorded >145km SW of the proposed project area (iNat, 2023).	**High** Otter midden recorded from the northwestern portion of the property approximately 180m south of the proposed powerline corridor.
Black-footed Cat *Felis nigripes*	VU	Protected	The Black-footed cat is typically a solitary, ground dweller that is crepuscular[1] and nocturnal (Sliwa *et al.,* 2016). During the day it makes use of dens, preferring hollowed termite mounds when available but also making use of burrows dug by other animals (e.g., Springhares, Ground Squirrels and Aardvark). It hunts small rodents and ground-dwelling birds found in short, open grasslands and is found in dry, open grasslands, savannah and karoo semi-desert. The estimated EOO is 930,000 km^2 and individual home ranges for males have been recorded to be approximately 16-20km^2 and for females were 9-10km^2 (Wilson *et al.* in Child *et al.,* 2016). The project area is surrounded by very large areas of cultivated land with small, remnant patches of natural vegetation remaining.	Recorded ±100km NW from proposed project area, near Lichtenberg (iNat, 2024).	**High** There is suitable habitat present and there are records of this species within the broader project area.
Serval *Leptailurus serval*	NT	Protected	This species depends on vegetation boarding water sources such as wetlands, marshland, rank grass and vleis as well as well-watered savannah with long-grass (Ramesh, *et al*., 2016).	The nearest record on iNaturalist is 13km SW of the project area.	**High**

[1] (of an animal) appearing or active in twilight.

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
			Servals prey on small mammals, birds, reptiles, fish, and rarely invertebrates. Their main diet consists of Vlei Rats (*Otomys sp.*) and Striped Mice (*Rhabdomys pumilio*).		The project area is within the distribution range of this species and there is suitable habitat present to the west of the proposed project area. The likelihood of occurrence in wetlands and seeps is therefore classified as High.
African Striped Weasel *Poecilogale albinucha*	NT		This species has a wide habitat tolerance including fynbos, lowland rainforest, semi-desert grassland, pine plantations and agricultural fields but is mainly found in savanna. (Child, *et al*., 2016; Stuart, Stuart & Do Linh San, 2015).	There are no records of this species within 80km north east of the project area (iNat, 2024).	**High** This species wide habitat tolerance suggests it has a high likelihood of occurrence within the project area. Its lack of records is not surprising given it is a nocturnal species.
Maquassie (Makwassie) Musk Shrew *(Crocidura maquassiensis)*	VU	-	This is a rare species, recorded only from disparate localities. Little is known about the habitats and ecology of this species. However, this near endemic species is known to inhabit wetlands, moist grasslands and grasslands. It may tolerate a wider range of habitats as is has been found in rocky or montane grassland, coastal forest, mixed bracken and grassland alongside a river and a garden.	No records of this species within 150km of the project area.	**Medium** There is suitable habitat present to the west of the BESS. The powerline crosses this area.

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
			It has not been recorded in the NW Province post-1999 despite the type specimen originating from Maquassie (1928) approximately ±85km SW of Klerksdorp. (Taylor et al., 2016, Cassola, 2016)		
Mountain Reedbuck *Redunca fulvorufula*	EN	None	Mountain Reedbuck are typically found in high altitude grasslands and rocky ridges and hillsides from 1,500 – 5,000m above sea level (IUCN, 2017 and Taylor *et al.*, 2016). They are predominantly grazers and occur in drier hilly areas (such as the Nama Karoo) utilising steep slopes and bases of hills that have a higher moisture content and therefore greener, softer grasses. They avoid open areas with no cover. The availability of drinking water is crucial to their survival and therefore existence. In 1999 this species was estimated to have a population of approximately 33,000 individuals but in 2016 was reported to have unexpectedly declined by 73% (IUCN, 2017; Taylor *et al.*, 2016).	Recorded ±35km E and ±32km NW of the project area in Oct 2022 (iNat, 2024).	**Medium** There is suitable habitat present and there are records of this species within the broader area.
Southern African Hedgehog *Atelerix frontalis*	NT	Protected	The species occurs throughout Gauteng, Free State, North West, western Limpopo and Mpumalanga provinces. Northeast and southwards Northern Cape to Eastern Cape. They marginally occur along the northern boundary with Free State and Mpumalanga provinces. This species inhabits savannah, grassland and Northern Upper Karoo vegetation types even suburban gardens. • Grassland vegetation types include the Soweto Highveld, Eastern Highveld, *Rand Highveld*, Carletonville Dolomite, Vaal-Vet Sandy Grassland and Frankfort Highveld Grasslands. • Savannah vegetation types include Polokwane Plateau Bushveld, Central Sandy Bushveld, Kimberley	The nearest record on iNaturalist is >70km north east of the project area	**Medium** The project area is within the distribution range of this species but suitable habitat (*Rand Highveld)* within the project area is limited and in poor condition although there is habitat within the PAOI. The likelihood of occurrence within the

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
			Thornveld, Moot Plains Bushveld, and Queenstown Thornveld. The species appears to prefer dense vegetation habitats and rocky outcrops that may provide food, cover and nesting materials. EOO: 748,169 km^2.		project area is therefore medium.
Leopard (*Panthera pardus)*	VU	VU	Leopards are widely distributed throughout southern Africa, typically occurring in densely wooded and rocky areas although it has been shown to have a wide habitat tolerance (grassland savannah, coastal scrub, shrubland, rugged mountainous regions and semidesert) (Swanepoel, *et al*., 2016; Stein, *et al*., 2020).	The nearest record on iNaturalist is >70km north east of the project area	**Low** Although suitable habitat is present, the project area occurs within a busy farming area adjacent to existing mines. If present, this species is likely to be a transient species within the area, using the Vaal Riparian area to move through.

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
African/Cape Clawless Otter *Aonyx capensis*	NT	-	This species is predominantly aquatic and seldom found far from permanent water. Freshwater is an essential water requirement, but they can occupy rivers with high pollution and eutrophication levels. The are generally found in marine habitats where there is access to freshwater, rocky shores and thick vegetation with an abundant food supply, but they have been recorded in rivers provided suitable sized pools persist (Okes *et al*., 2016 in Child *et al*., 2016). The project area is located approximately 1.4 km from the Vaal River. The likelihood of occurrence for this species in the project area is therefore classified as **low**.	Recorded >8km Seon the Vaal River (iNat, 2024).	**Low** The project area occurs within the distribution range of this species however, suitable habitat is not present within the project area although it is present within the PAOI. The likelihood of occurrence in the project area is therefore classified as Low. If present, it is likely a transient.
Brown Hyena *Parahyaena brunnea*	NT	Protected	The Brown Hyena inhabits desert areas (<100 mm MAR), semi-desert, open scrub and open woodland savannah (<700 mm) (Wiesel, 2015). They typically avoid developed areas but can survive close to them. However, they do require some form of cover to lie under during the day. As such, they prefer rocky, mountainous areas with bush cover in the bushveld areas of South Africa (Yarnell *et al.,* 2016 in Child *et al*., 2016). The Brown Hyena population in SA is thought to be underestimated at 1700 individuals (800-2200) with greatest numbers in Limpopo, North West and Eastern Cape provinces. This species has low levels of occupancy throughout the Free State (Yarnell *et al.,* 2016). Densities are highest in protected areas compared to neighbouring unprotected rangelands but this species is tolerant of land-use change where reliable	There are no records of this species within 80km north east of the project area (iNat, 2024).	**Low** Although suitable habitat is present within the project area (i.e., grasslands), this species is unlikely to occur outside of protected areas.

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
			alternative food resources exist (Yarnell *et al.,* 2016). Brown Hyaenas are considered widespread but rare and secretive, and although 65% of the population live in mixed sex clans (4–14 individuals) they are solitary foragers who spend much of their time alone. The remaining 35% of the population immigrate within home ranges of ±100 km^2 (Yarnell *et al.,* 2016).		
Southern African Vlei Rat (Grassland type) *Otomys auratus*	NT	-	This species is associated with mesic grasslands and wetlands within alpine, montane and sub-montane regions. They occur in dense vegetation in close proximity to water (Taylor *et al.,* 2016 in Child *et al.*, 2016). The project area is located approximately 1.1 km from the Vaal River and based on desktop data and Satellite Imagery the preferred habitat of this species is not present within the project area. As such, the likelihood of occurrence is classified as **low**.	No records within 150km of the project area (iNat, 2024).	**Low** The project area is within the distribution range of this species however, suitable habitat is not present within the project area, although there is suitable habitat within the PAOI. The likelihood of occurrence within the project area is therefore classified as low.

Name	Threat Status		Habitat	Known Occurrence	Likelihood of Occurrence
	National (SA red list, 2016)	TOPS			
African White-tailed Rat *Mystromys albicaudatus*	VU	-	African White-tailed Rats are endemic to South Africa and Lesotho occurring in the highveld grasslands and succulent karoo in southern Mpumulanga, Free State, high-lying areas of KwaZulu Natal, Eastern Cape, south-eastern North-West and marginally into the Northern Cape *(Avenant et al.* in Child *et al., 2016)* and have an AOO of 3,719km^2. This species is nocturnal living in burrows and crevices. Little is known about this species in the wild. They are often associated with calcrete soils in grasslands and are not found on soft, sandy substrates, rocks, wetlands or riverbanks (Avenant *et al.* in Child *et al*., 2016). There is evidence that they survive in disturbed areas and sparse grasslands but are not associated with transformed habitat (e.g., agricultural land).	There are no records of this species within 140km of the project area (iNat, 2023).	**Low to Moderate** Suitable habitat may be present within the intact grassland patches.

5. PLANT SPECIES THEME

5.1. Floristics

A total of 49 plant species from 26 families were recorded within the project area (Table 5.1) (a full species list has been included in Appendix 1). The Fabaceae had the highest number of species (five) followed by the Asteraceae and Malvaceae (four species), Anacardiaceae, Apocynaceae and Asphodolaceae, each with three species. The remaining families each had two or one species.

Table 5.1: Number of families and species recorded within the project site.

Family	No. Species	Family	No. Species
FABACEAE	5	ALLIACEAE	1
ASTERACEAE	4	ASPARAGACEAE	1
MALVACEAE	4	CACTACEAE	1
ANACARDIACEAE	3	CELASTRACEAE	1
APOCYNACEAE	3	COMMELINACEAE	1
ASPHODELACEAE	3	DIPSACACEAE	1
AGAVACEAE	2	HYPOXIDACEAE	1
CONVOLVULACEAE	2	OLEACEAE	1
HYACINTHACEAE	2	POLYGALACEAE	1
POACEAE	2	PTERIDACEAE	1
RHAMNACEAE	2	RUBIACEAE	1
SOLANACEAE	2	THYMELAEACEAE	1
VERBENACEAE	2	ULMACEAE	1

5.2. Species of Conservation Concern

Of the 49 recorded species, 43 species are listed as Least Concern (LC) and six as Not Evaluated (NE). No SCC were recorded in the project area.

The DFFE Screening Report identified the Plant Species Theme as being medium based on the likely occurrence of one SCC (sensitive species 691) within the project area. Sensitive specie 691 is listed as VU and is known from fewer than ten locations occurring between Belfast, Ermelo and Wolmaranstad. It is associated with undulating grassland in damp areas. Since there are wetlands present along the proposed powerline corridor, the likelihood of occurrence of these species within these areas is medium. However, if present, project infrastructure can be designed to avoid populations of this species ensuring that impacts on individuals are low to negligible.

The POSA and iNaturalist databases for the PAOI were checked for records of SCC. None were found on either database.

Since no SCC were recorded during the field survey, the specialist disagrees with the DFFE screening report that the Plant Species Theme should be medium and proposes that it should rather be classified as low.

5.3. Alien Invasive Plant Species

Six exotic species were recorded within the project area (Table 5.2) and were typically found within disturbed sites, such as along road verges and in overgrazed area. Of these six species, two are listed alien invasive plant species on the National Environmental Management: Biodiversity Act (NEM:BA) (Act No. 10 0f 2004) and two are listed as a Category 1 species on the Conservation of Agricultural Resources Act (CARA) (Act No. 43 of 1983).

Under the NEM: BA act, Category 1b species must be eradicated and under CARA, Category 1 plant species must be removed & destroyed immediately. No trade in these plants is permitted.

Table 5.2: List of exotic plant species recorded on site.

Family	Species	NEM:BA Alien	CARA
SOLANACEAE	*Cestrum parqui*	Category 1b	Category 1
MALVACEAE	*Hibiscus trionum*	-	-
CACTACEAE	*Opuntia cespitosa*	-	-
SOLANACEAE	*Solanum elaeagnifolium*	Category 1b	Category 1
VERBENACEAE	*Verbena aristigera*	-	-
VERBENACEAE	*Verbena incompta*	-	-

6. TERRESTRIAL BIODIVERSITY THEME

The DFFE Screening Report classifies the Terrestrial Biodiversity Theme Sensitivity of the project area as VERY HIGH (Figure 2.3) due to the following sensitivity features:

- CBA2 and ESA 1 (refer to section 6.1)
  - Vulnerable Ecosystem – Rand Highveld Grassland (refer to section 6.2)
- National Protected Area Expansion Strategy (NPAES) (refer to section 6.3)
- Bushybend Private Nature Reserve (refer to section 6.3)

This chapter reviews the spatial planning tools associated with each of these features and provides comment on the implication these features have on development, should the project proceed.

6.1. North West Biodiversity Spatial Plan

The North West Biodiversity Sector Plan (North West Department of Rural, Environment and Agricultural Development (DREAD), 2015) maps biodiversity priority areas, including Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs) and Other Natural Areas (ONAs) which require safeguarding to ensure the persistence of biodiversity and ecosystems functioning, through a systematic conservation planning process. It is important to note that Biodiversity Sector Plans are developed at relatively course scales using the best available spatial data. These maps therefore need to be verified at project level and the appropriate land use recommendation applied.

- CBA's are defined as "*terrestrial and aquatic areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services*." (DREAD, 2015). The provided map distinguishes between CBA 1 areas, which are those that are likely to be in a natural condition, and CBA 2 areas, which are areas that are potentially degraded or represent secondary vegetation. Subsequent to this publication, SANBI published guides for developing Critical Biodiversity Area maps. These guidelines require that degraded or secondary natural areas are classified as ESAs, and not CBAs.

- ESA's are "*terrestrial and aquatic areas that are not essential for meeting biodiversity representation targets (thresholds), but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. The degree or extent of restriction on land use and resource use in these areas may be lower than that recommended for CBAs*." (DREAD, 2015). As with the CBAs, a distinction is made between ESA 1 that are areas in a natural, near natural or moderately degraded condition and ESA 2 which are degraded and need to be restored.

- ONAs are "*areas that still contain natural habitat but that are not required to meet biodiversity targets"* (DREAD, 2015).

According to the North West Biodiversity Sector Plan (2015), the footprint of the BESS and a portion of the EGI occur within a CBA 2 area and a small portion of the powerline also occurs within an ESA 1 (Figure 6.1). The CBA layer for the North West Biodiversity Spatial Plan does not include the underlying reason why areas have been selected as CBAs, however, it does provide a broad overview on the categories that triggered the CBA status. Two categories (corridor and corridor node) triggering the CBA 2 status within the proposed project site were identified and comment has been provided in Table 6.1 below on how project activities will affect these CBA 2 and ESA 1 features. Despite occurring within a nationally vulnerable ecosystem, the feature for this is not included in the reason layer which is possibly an oversight. This trigger has therefore also been assessed.

Table 6.1: Comment on the features triggering CBA/ESA status

CBA Category Triggered		**Comment**
T9	Corridor Node	If the vegetation present within the corridor and corridor node is natural, it is considered a CBA 2 but if it is not natural it is considered and ESA 2. Based on the data from the field survey, the area is degraded natural vegetation and therefore the CBA2 status remains. However, given how wide the corridor is where the project is located (refer to Figure 6.1), the functioning of the corridor can persist to the east and west of the project area and as such the functioning of the broader CBA and ESA will continue.
T7	Corridor	
	Vulnerable Ecosystem	The most recent literature, that describes Rand Highveld Grassland as Vulnerable rather than Endangered, has been applied. According to the North West Biodiversity Spatial Plan, modification of remaining patches of provincially Endangered and Vulnerable ecosystems (vegetation types) larger than 5ha should be *"limited to existing irreversibly modified or heavily degraded areas"*. The results from the field survey indicate that the site where the BESS is located is heavily degraded as a result of ongoing heavy grazing by livestock. Furthermore, the corridor along which the EGI is located is comprised of a combination of heavily degraded vegetation and transformed vegetation.

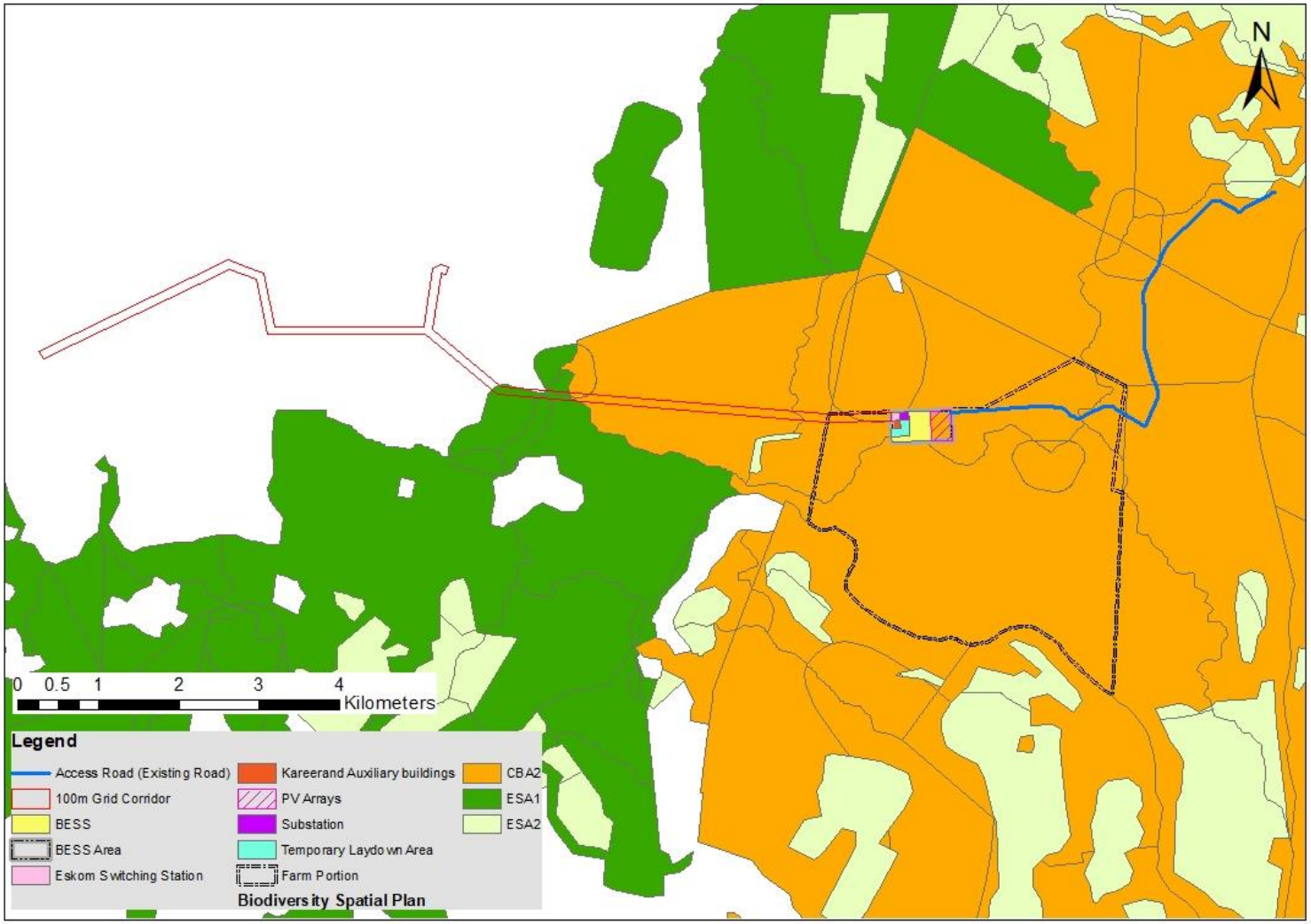

Figure 6.1: The Project area in relation to the CBAs and ESAs.

6.2. Vegetation Types Present

The proposed area occurs within the grassland biome which is the second largest biome in South Africa covering approximately 339 237 km^2. Although 30% of this biome is irreversibly transformed, it remains poorly protected with only 1.9% of the biodiversity target formally conserved.

According to the National Vegetation Map (2018), which was compiled to provide a greater level of detail for floristically based vegetation units in South Africa, the BESS occurs within Rand Highveld Grassland and the EGI corridor occurs in both Rand Highveld Grassland and Vaal Reefs Dolomite Sinkhole Woodland (Figure 6.2). The field survey confirmed these vegetation type were present and their distribution has been mapped (Figure 6.3).

6.2.1. ***Rand Highveld Grassland***

Rand Highveld Grassland is listed as Vulnerable at a National level (RLE, 2021) and as Endangered at a Provincial Level (North West Department of Rural, Environment and Agricultural Development (DREAD), 2015). This vegetation type occurs across Gauteng, North-West, Free State and Mpumulanga Provinces on highly variable landscapes that include sloping and undulating plains interspersed with slightly elevated ridges. It is typically species rich with wiry grassland occurring on the plains and shrubland and sparse woodland occurring on the rocky outcrops (Mucina and Rutherford, 2012).

Although this vegetation type was present within the project area, it was heavily degraded as a result of ongoing grazing by livestock such as cattle (Figure 6.4). Dominant species included *Eragrostis lehmanniana, Asparagus laricinus, Hilliardiella elaeagnoides, Hermannia coccocarpa, Chlorophytum cooperi, Berkheya radula, Hypoxis hemerocallidea, Tulbaghia acutiloba, Bulbine capitata, Scabiosa columbaria, Tephrosia capensis, Lasiosiphon capitatus, Ipomoea bathycolpos, Kohautia amatymbica, Asclepias stellifera and Hibiscus trionum.* Rehabilitation of this vegetation back to its original state is unlikely to be successful as heavily disturbed areas were infested with *Asparagus laricinus.*

Rand Highveld Grassland is listed as poorly protected with 43% (443,174 ha) of the original extent remaining (RLE, 2021). The construction of the BESS will result in the loss of approximately 26ha (0.006%) of heavily degraded Rand Highveld Grassland and the construction of the powerline will result in the approximate loss of 2.5 ha (0.0006%) of heavily degraded Rand Highveld Grassland. The loss of such a small area of heavily degraded grassland is unlikely to affect the conservation status of this vegetation type as the ecological function of the area that will be impacted is already compromised.

6.2.2. ***Vaal Reefs Dolomite Sinkhole Woodland***

Vaal Reefs Dolomite Sinkhole Woodland is listed as Least Concern at a National Level (RLE, 2021) and Vulnerable at a Provincial Level (DREAD, 2015). This vegetation type has a narrow distribution occurring in the North-West and Free State Provinces. It is associated with slightly undulating landscapes dissected by rocky chert ridges and is comprised of a grassland-woodland complex with woodland occurring as clumps around sinkholes, particularly where dolomite outcrops are present

(Mucina and Rutherford, 2012). There are small, degraded patches of this vegetation type along the powerline route.

Although this vegetation type is not protected, 71% (24630 ha) of this vegetation remains. Project infrastructure will result in the approximate loss of 20 ha (0.08%) of this vegetation type.

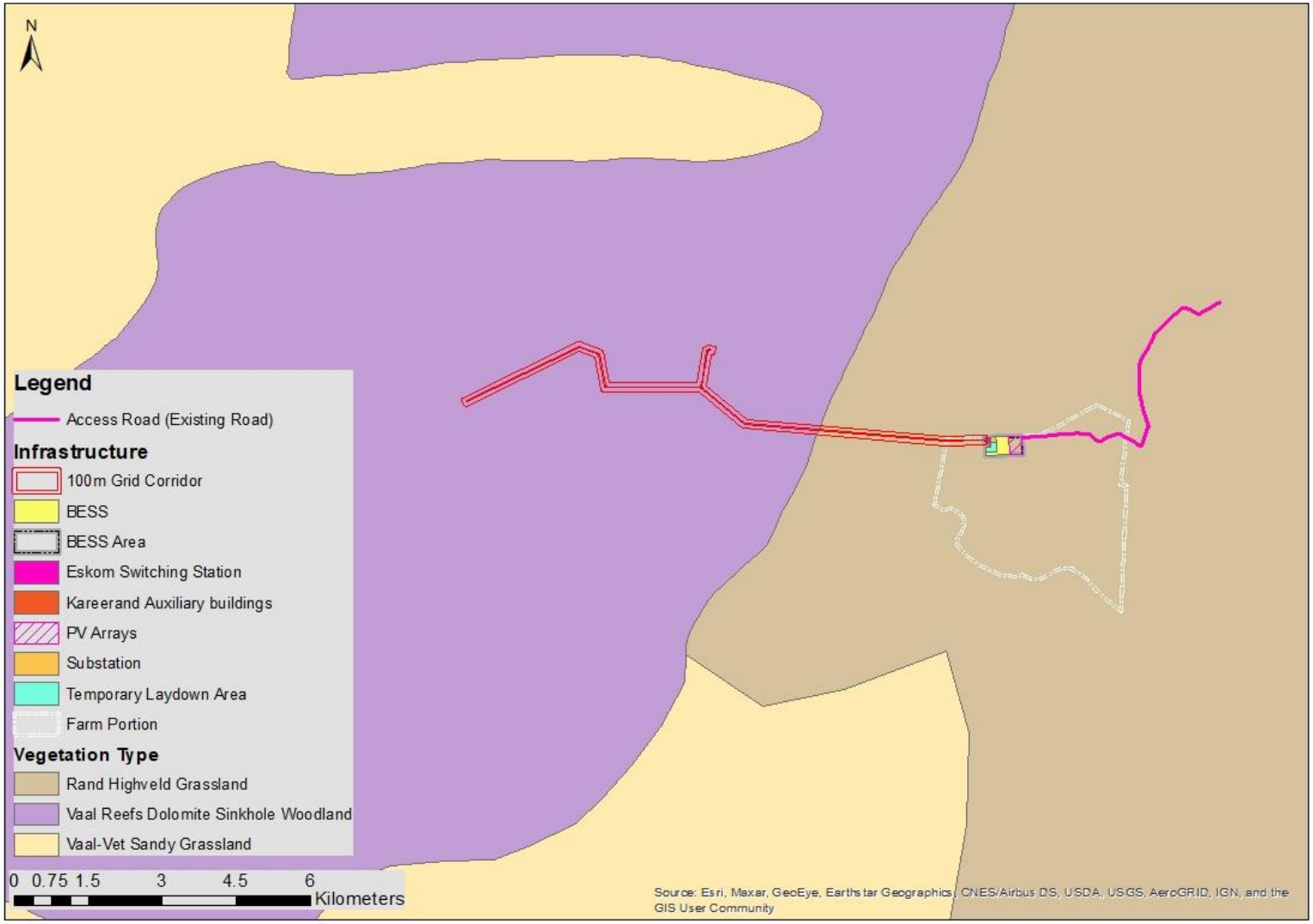

Figure 6.2: National Vegetation Map for the Project Area.

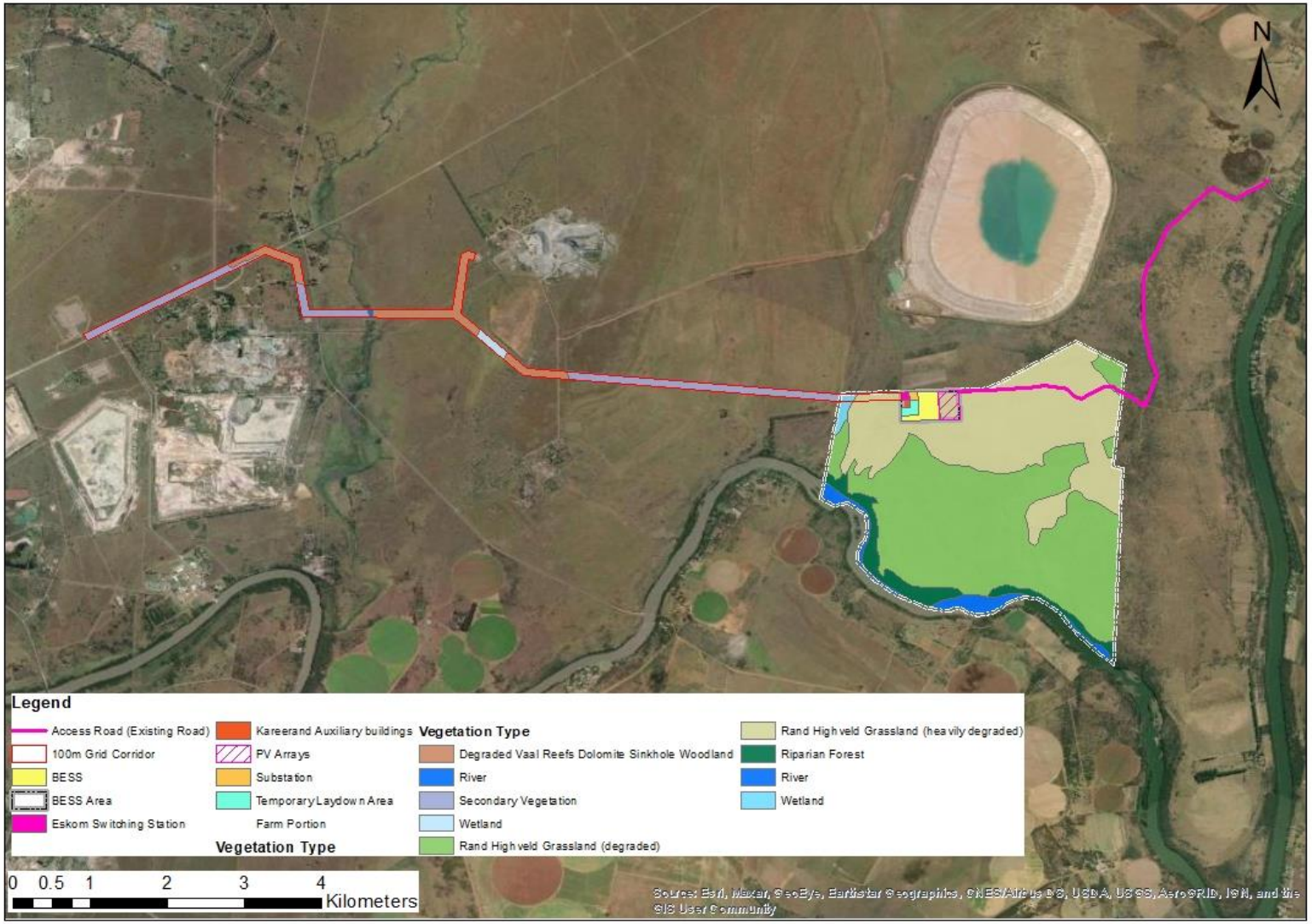

Figure 6.3: Vegetation map for the project area based on data gathered from the field survey.

6.3. Protected Areas and National Protected Area Expansion Strategy

The project site occurs within the Bushybend Private Nature Reserve. The site was declared a protected area by the landowner, likely to protect it from mining. Although there is game on the site, it is used to graze cattle and is not currently managed as a nature reserve.

Within South Africa, not all 969 distinct ecosystems are equally protected. Of these, 21% are well protected, 13% are moderately protected, 30% are poorly protected and 37% are not protected at all (Department of Environmental Affairs, 2016). The goal of the National Protected Area Expansion Strategy (NPAES) "*is to achieve cost effective protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change".* Under this strategy, priority areas that are suitable for protected areas have been mapped.

NPAES in the North West were selected based on Critical Biodiversity priority areas (i.e. corridors and priority conservation nodes) and include under protected ecosystem types particularly in the Central Bushveld, Arid Highveld Grasslands and Eastern Kalahari Bushveld ecosystems. The aim of these areas is to improve landscape connectivity between reserves (Department of Environmental Affairs, 2016). The site does not fall within the 2011 National PAES but it does fall within a negotiated focus area identified in 2018 but not yet formalised (Figure 6.4). Although the placement of the infrastructure may increase habitat fragmentation and thus impact on the ecological corridor, the footprint of the proposed development is small enough that the impact is likely to be low to negligible.

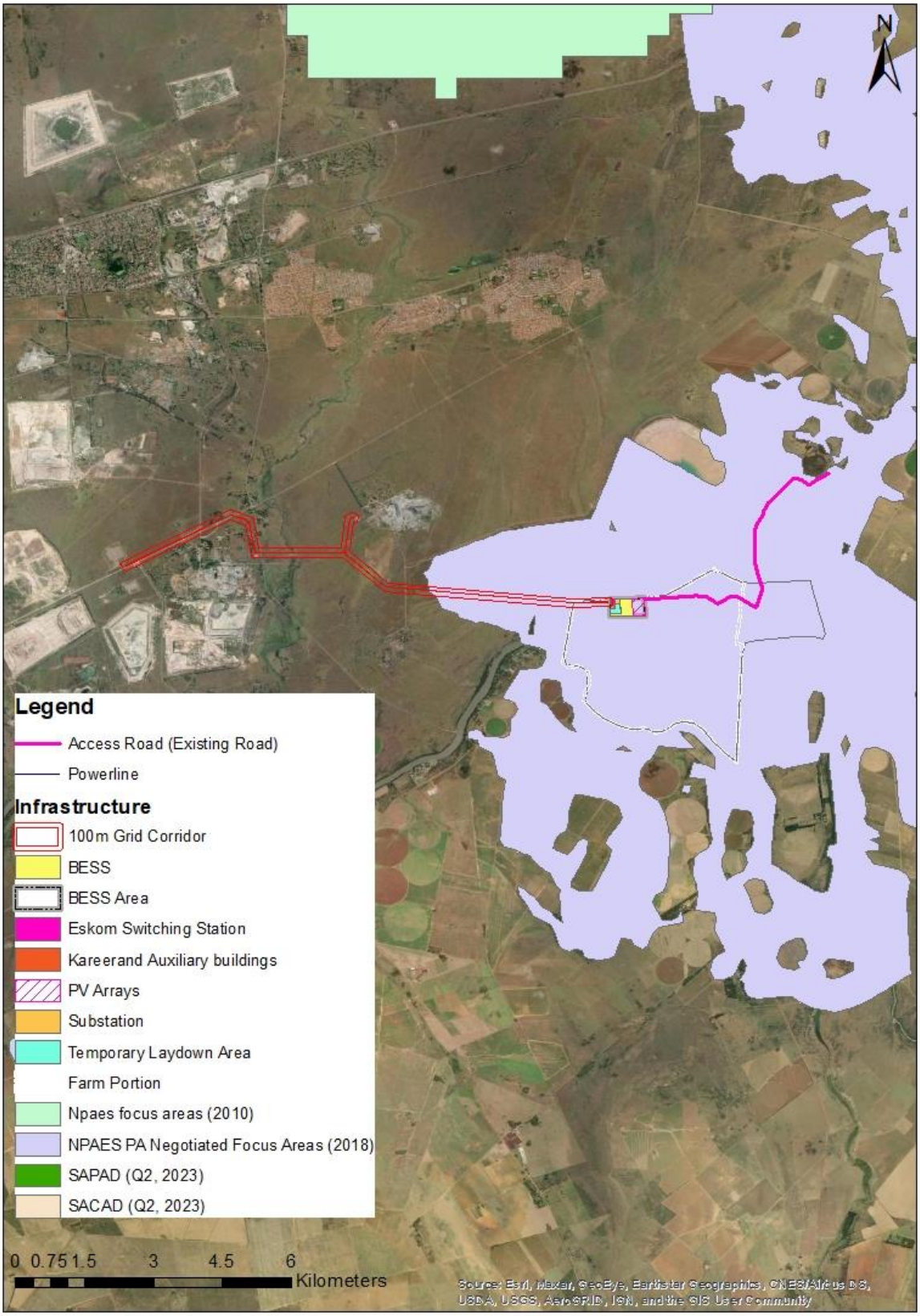

Figure 6.4: Map illustrating the project area in relation to conservation areas and NPAES.

7. SITE ECOLOGICAL IMPORTANCE

The results from the desktop assessment and field survey have been used to calculate the SEI for the vegetation and faunal habitat present within the project area.

7.1. Site Ecological Importance - Fauna

The Spotted-necked Otter (VU), Black Footed Cat (VU), African Striped Weasel (NT) and Serval (NT) have a high likelihood of occurrence within the project area. The conservation importance (CI) is considered high for vulnerable species and medium for near-threatened species. The SEI has been assessed for species with a high likelihood of occurrence as per the SANBI (2021) Guidelines (Table 7.1 and Figure 7.1).

All habitats are fragmented by the road network and neighbouring land uses such as mining and agriculture and as such the FI is medium.

Given the small size of the proposed facility together with the short construction time frame, it is anticipated that species will return to the PAOI once the disturbance has ceased. As such, the RR for all species is considered high.

The Site ecological importance of habitats to faunal SCC with a high likelihood of occurring on site is as follows:

- The Very Degraded Rand Highveld Grassland, Degraded Rand Highveld Grassland and Vaal Reefs Dolomite Sinkhole Woodland habitat within the project area is considered to have a Low SEI to the Black Footed Cat (VU) and African Striped (NT).
- The seeps and wetland habitat within the project area is considered to have a Low SEI to the Spotted-necked Otter (VU) and Serval (NT).

Table 7.1: Sensitivity assessment for faunal species within the project area.

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience	SEI
Black Footed Cat (VU) and African Striped Weasel (NT) Occurring in Rand Highveld Grassland (Degraded), Rand Highveld Grassland (Very Degraded) and Vaal Reefs Dolomite Sinkhole Woodland (Very Degraded)	High	Medium	Medium	High	**Low**
	Highly likely occurrence of VU species.	Narrow corridors of good habitat connectivity and larger areas of poor habitat connectivity with a regularly used road network between patches of degraded habitat.		Receptor resilience is based on the specific project activities. In this instance the project footprint is small and the construction phase will be relatively short meaning that the disturbance to these species will be in the short term with a small spatial extent, as such, species have a high likelihood of returning to site once the disturbance has ceased.	
Spotted-necked Otter occurring in aquatic habitat.	High	Medium	Medium	High	**Low**
	Highly likely occurrence of VU species.	Narrow corridors of good habitat connectivity and larger areas of poor habitat connectivity with a regularly used road network between patches of degraded habitat.		Receptor resilience is based on the specific project activities. In this instance the project footprint is small and the construction phase will be relatively short meaning that the disturbance to these species will be in the short term with a small spatial extent, as such, species have a high likelihood of returning to site once the disturbance has ceased.	

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience	SEI
Serval (NT) in Wetlands and Seeps	Medium	Medium	Medium	High	**Low**
	Highly likely occurrence of a NT species.	Narrow corridors of good habitat connectivity and larger areas of poor habitat connectivity with a regularly used road network between patches of degraded habitat.		Receptor resilience is based on the specific project activities. In this instance the project footprint is small and the construction phase will be relatively short meaning that the disturbance to these species will be in the short term with a small spatial extent, As such, species have a high likelihood of returning to site once the disturbance has ceased.	

7.2. Site Ecological Importance - Flora

Three vegetation types were recorded within the project area:

- Degraded and Very Degraded Rand Highveld Grassland
- Vaal Reefs Dolomite Sinkhole Woodland
- Secondary Vegetation

Rand Highveld Grassland is listed as a VU ecosystem and as such the CI is medium. Given the degraded and fragmented nature of the PAOI, the FI was medium and the RR for degraded Rand Highveld Grassland was medium and for very degraded Rand Highveld Grassland it was High since species diversity is low and comprised of ruderal species that will recover quickly after a disturbance. The overall SEI for the area classified as degraded is medium and for the area classified as very degraded, it is low (Table 7.2 and Figure 7.2)Very .

There are small patches of very degraded Vaal Reefs dolomite Sinkhole Woodland along the powerline corridor. These areas are highly fragmented and there is a low likelihood of SCC occurring within this vegetation type. As such, the CI is low, the FI is medium and the RR is high. The overall SEI for this vegetation type is very low.

Similarly, secondary vegetation also has a very low SEI.

Table 7.2: Sensitivity assessment for each vegetation type within the project area.

Habitat / Species	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor Resilience	SEI
Rand Highveld Grassland (Degraded)	Medium	Medium	Medium	Medium	**Medium**
	Threatened Vulnerable Ecosystem with unlikely occurrence of SCC.	>20 ha of semi-intact VU ecosystem.		Habitat will recover slowly (more than 10 years) to restore >70% species composition.	
Rand Highveld Grassland (Very Degraded)	Medium	Medium	Medium	High	**Low**
	Threatened Vulnerable Ecosystem with unlikely occurrence of SCC.	>20 ha of semi-intact VU ecosystem.		Given how degraded this area is, habitat will recover relatively quickly (5-10 years) to restore >70% of the original species composition.	
Vaal Reefs Dolomite Sinkhole Woodland (Very Degraded)	Low	Medium	Low	High	**Very Low**
	This vegetation is degraded and highly fragmented. There are no confirmed or highly likely populations of SCC.	Medium (>5ha but<20ha) of semi-intact area of any conservation status with narrow corridors of connectivity and a busy road network		Given the degraded nature of the grassland within the project area, habitat will recover relatively quickly (5-10 years) to restore >70% of the original species composition.	
Secondary Vegetation	Low	Medium	Low	High	**Very Low**
	This vegetation is degraded and highly fragmented. There are no confirmed or highly likely populations of SCC.	Medium (>5ha but<20ha) of semi-intact area of any conservation status with narrow corridors of connectivity and a busy road network		Given the degraded nature of the grassland within the project area, habitat will recover relatively quickly (5-10 years) to restore >70% of the original species composition.	

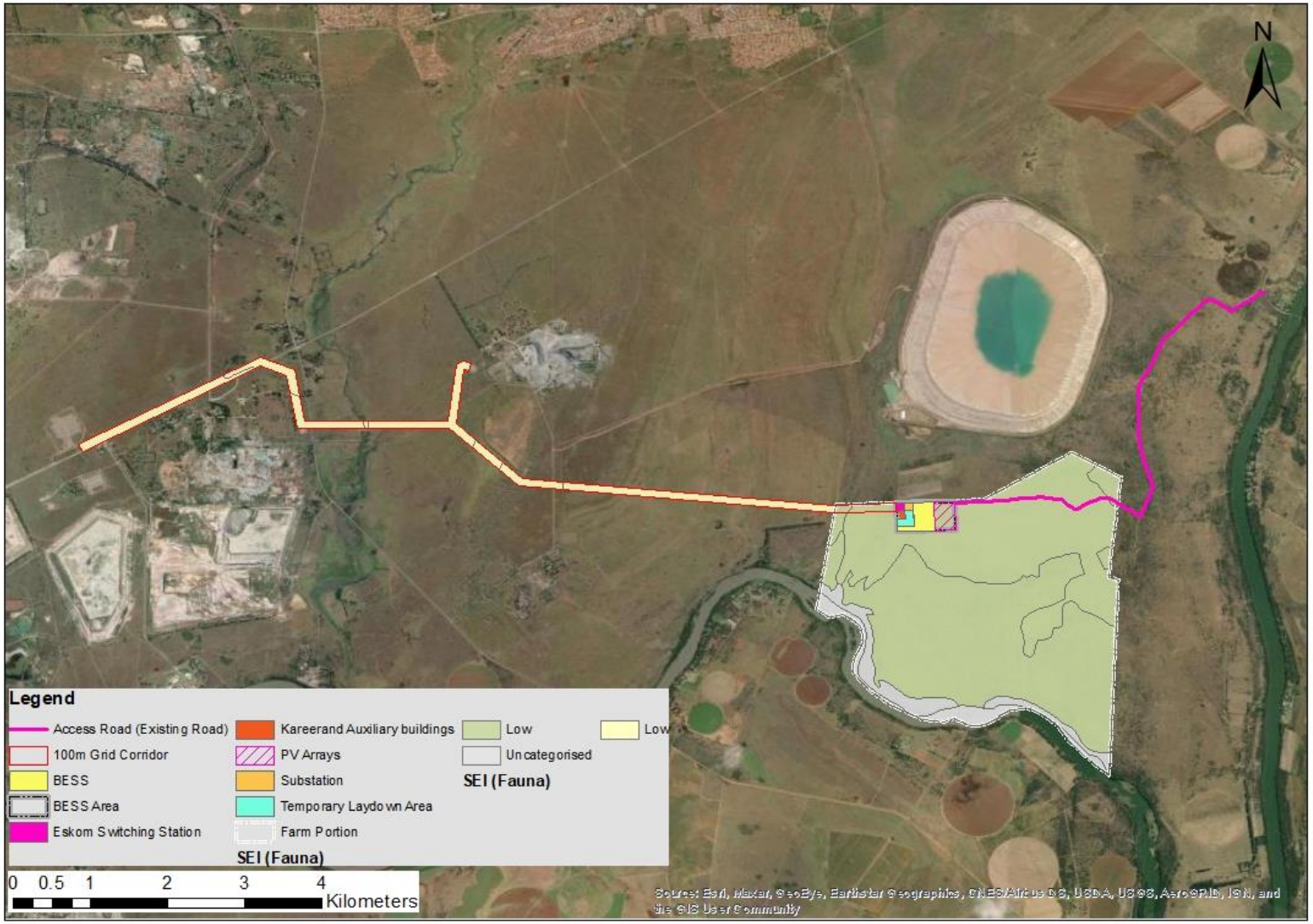

Figure 7.1: Faunal sensitivity map for the project area based on data gathered from the field survey and the desktop assessment.

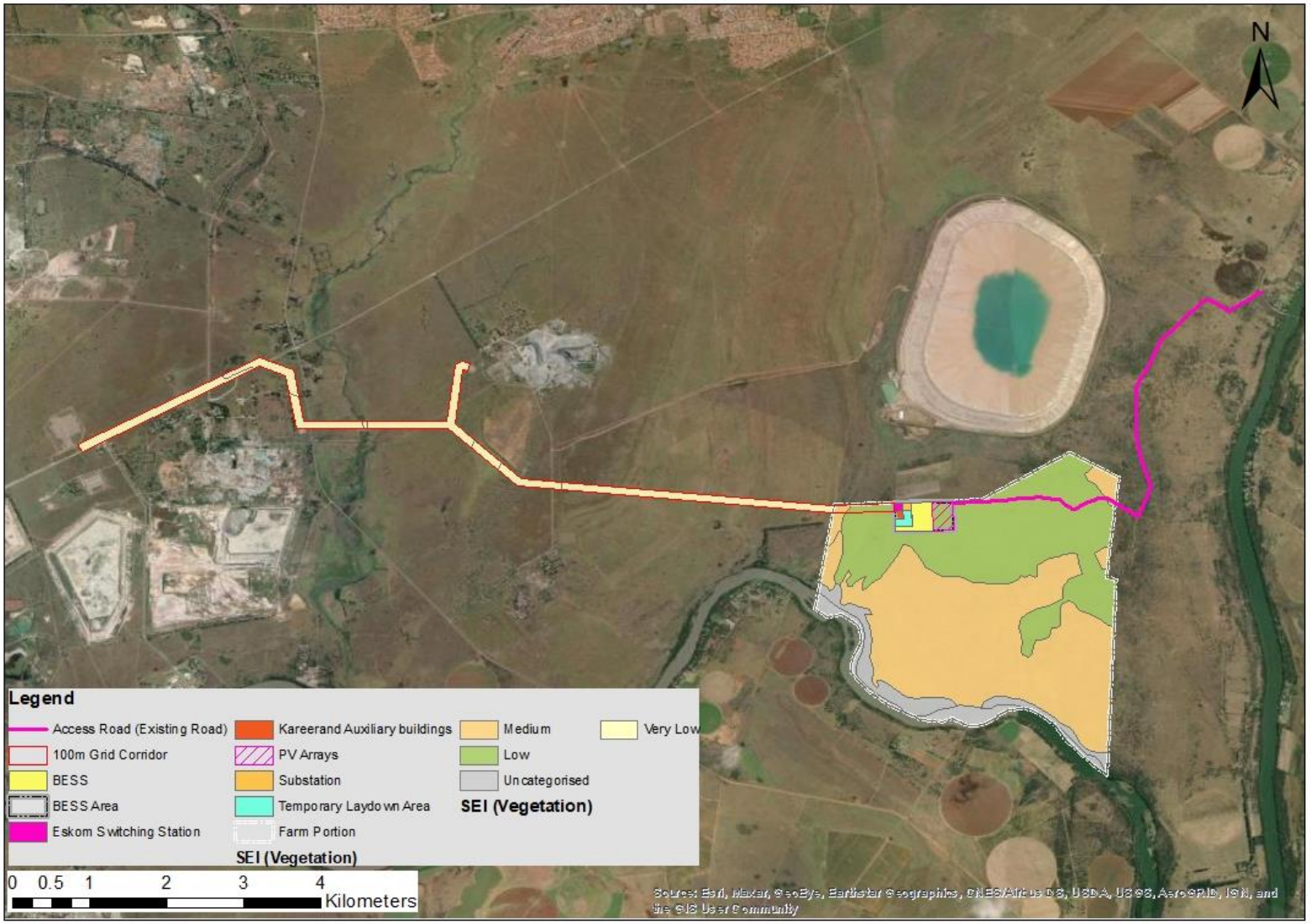

Figure 7.2: Botanical sensitivity map for the project area . This is based on data gathered from the field survey and the desktop assessment.

7.3. **Combined SEI**

According to the Species Environmental Assessment Guideline (SANBI, 2020), the SEI evaluated for each taxon/receptor should be combined into a single multi-taxon/receptor evaluation of SEI for the project area to allow the component authority to evaluate the SEI for the entire project area rapidly and at a single glance. As such, the highest overall SEI rating has been applied to each habitat type assessed in terms of the faunal and botanical sensitivity. Table 7.3 combines the overall SEI for each habitat type based on the assessment in Table 7.1 and 7.2. The combined SEI is illustrated in Figure 7.3 below.

Table 7.3: Combined overall SEI for each habitat type.

Habitat	Floral SEI	FAUNAL SEI	OVERALL COMBINED SEI
Degraded Rand Highveld Grassland	Medium	Low	Medium
Very Degraded Rand Highveld Grassland	Low	Low	Low
Vaal Reefs Dolomite Grassland	Very Low	Low	Low
Secondary Vegetation	Very Low	Low	Low

7.4. Management Guidelines

Management guidelines recommend the following:

- For areas with a **high SEI**, avoidance mitigation must be implemented where feasible and where this is not feasible, minimisation mitigation such as reducing the project footprint. Limited development activities of low impact are acceptable in these areas. Offset mitigation may be required for high impact activities.
- For areas of **medium SEI,** development activities of medium impact are acceptable provided appropriate mitigation and management measures are implemented.
- For areas of **low SEI,** development activities of medium to high impact are acceptable provided appropriate mitigation and management measures are implemented.
- For areas of **very low SEI**, development activities of medium to high impact are acceptable and mitigation and management measures may not be required although they are good practice.

Since project infrastructure is located in an area with an overall SEI of low and very low, development activities of medium to high impact are acceptable provided appropriate mitigation and management measures are implemented.

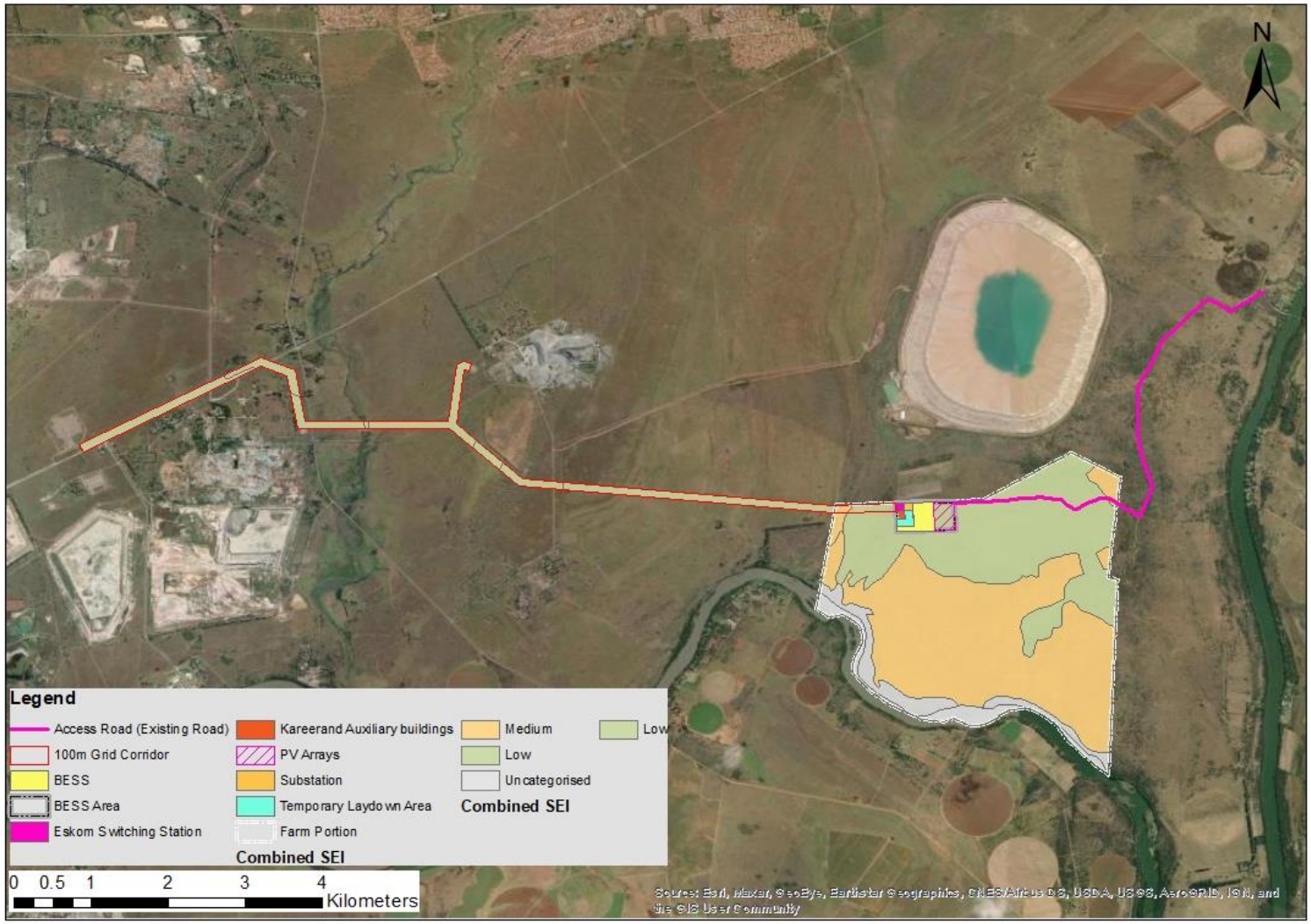

Figure 7.3: Combined sensitivity map for the project area . This is based on data gathered from the field survey and the desktop assessment.

8. PROPOSED MANAGEMENT ACTIONS

Given that development is located within an area of low to very low sensitivity, direct ecological impacts are anticipated to be low to negligible for the project area and as such a compliance statement is sufficient for this project area and a full impact assessment is not required. However, it is good practice to implement mitigation measures to further reduce impacts on the environment and as such the following management actions are recommended and must be included as conditions in the Final EMPr as well as the conditions of the Environmental Authorisation (EA), if granted:

8.1. Plants and Terrestrial Biodiversity

- Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.
- Temporary laydown areas must be placed in areas of low or very low sensitivity.
- Topsoil (20 cm, where possible) must be collected and stored in an area of low or very low sensitivity and used to rehabilitate impacted areas that are no longer required during the operational phase (e.g. laydown areas).
- Laydown areas must be rehabilitated if no longer required during the operational phase.
- Disturbed areas associated with linear infrastructure must be rehabilitated immediately after construction.
- Existing access roads must be used where feasible and these must be upgraded where necessary.
- Alien invasive plant clearing should be undertaken in line with an Alien Vegetation Management plan, which should be compiled pre construction.
- Employees must be prohibited from making open fires during the construction phase.
- Employees must be prohibited from collecting plants. It is recommended that spot checks of pockets and bags are done on a regular basis to ensure that no unlawful harvesting of plant species is occurring.

8.2. Animals

- The development must consolidate road networks to minimise the loss of faunal habitat.
- All construction and construction related activities (including parking of vehicles and machinery) must remain within the approved project footprint.
- No construction and construction related activities are permitted outside of the approved project footprint and a fine system must be put in place for transgressions by the developer and included in contractual agreements with all staff and contractors.
- Microhabitats (e.g. rock stacks and logs) in the clearing footprint must be relocated to the same habitat immediately adjacent to the removal site. E.g. Rock stacks should be restacked.
- Rehabilitation efforts must provide habitat for faunal species by placing logs and rocks at strategic sites to provide shelter for small mammals and reptiles.
- A clause must be included in contracts for ALL construction personnel (i.e. including contractors) working on site stating that: "no wild animals will be hunted, killed, poisoned or captured. No wild animals will be imported into, exported from or transported in or through the province. No wild animals will be sold, bought, donated and no person associated with the development will be in possession of any live wild animal, carcass or anything manufactured

from the carcass." A clause relating to fines, possible dismissal and legal prosecution must be included should any of the above transgressions occur, especially for SCC.

- If pest control measures (e.g., pesticides for rodents) is required only organic bait designed to target the pests may be used. This is to prevent carnivores from ingesting poisoned pests and dying themselves.
- The ECO should appoint a member of staff to walk ahead of construction machinery directly prior to vegetation clearance. Should any faunal species be identified during the walk through, these should be allowed to move out of harm's way prior to vegetation clearance.
- External lighting should be avoided. If required, this should be down lighting and/or low wattage as close to the ground as possible.
- Dust suppression measures must be implemented in the dry and/or windy months.
- All machinery, vehicles and earth moving equipment must be maintained and the noise these create must meet industry minimum standards. e.g. the sound generated by a machine must be below a certain decibel as prescribed in the relevant noise control regulations.
- A Storm Water Management Plan must be drafted and implemented to prevent runoff entering aquatic systems and causing siltation and pollution of this faunal habitat. Hard surfaces should be avoided.
- No construction night lighting must be allowed. If required, minimise lighting in open space areas within development and any external lights must be down lights placed as low as possible and installation of low UV emitting lights..
- Development must be designed to allow unencumbered movement, especially of small faunal species. e.g.
    - Permeable internal and external fences/walls (if any) must be implemented to allow for the movement of fauna through the development. These must have ground level gaps of 10cm x 10cm at 10m intervals. These gaps must be kept free of obstructions, including plant growth and debris.
    - All guttering and kerbstones must be sloped i.e. must be less than 450 on either side or kerbstones should be slanted or lowered (less than 10cm) at 10m intervals to allow for easy movement of toads
    - Steep sided drains, gutters, canals and open pits/trenches must be covered with mesh (5mm x 5mm) to prevent fauna falling in and getting stuck. No unnecessary structures that would act as pitfall traps for animals must be constructed
    - If there are retaining walls, steps should be formed to allow for toads to move over them. These must be vegetated with plant species that offer cover.
- Speed restrictions must be implemented on all vehicles within the development footprint (40km/h is recommended) to reduced faunal mortalities on the project roads.
- No night driving should be permitted, if unavoidable, this must be restricted, and speed limits adhered to.
- Any faunal species that may die as a result of construction must be recorded (i.e. be photographed, GPS co-ordinates taken) and the records uploaded to iNaturalist.
- A trained snake handler must be on call during construction to remove any snakes within construction areas.
- A clause relating to fines, possible dismissal and legal prosecution must be included in all contracts for ALL personnel (i.e. including contractors) working on site should any speeding or persecution of animals occur.
- All decommissioning related activities (including parking of vehicles and machinery) must remain within the approved project footprint.

- No decommissioning related activities are permitted outside of the approved project footprint and a fine system must be put in place for transgressions by the developer and included in contractual agreements with all staff and contractors.

9. CONCLUSIONS

9.1. Conclusions and Recommendations

No faunal or plant species were recorded within the project area or are likely to occur within the project area.

Although the vegetation recorded within the project area is Rand Highveld Grassland, which is listed as a VU ecosystem, it is heavily degraded as a result of ongoing grazing by livestock such as cattle. Furthermore, the infrastructure will only result in the loss of 0.0006% of the remaining extent of this vegetation type. The SEI analysis for the project area takes into account the presence of threatened ecosystems and SCC combined with functional integrity and receptor resilience. Based on the degraded nature of the project area and the small infrastructure footprint, the project area has a sensitivity of low to very low.

Given that the overall SEI for the project area is low, impacts from project activities on the terrestrial biodiversity, fauna and flora are low to negligible. Management guidelines indicate that for area of low SEI, medium to high impacts are acceptable provided mitigation measures are implemented and for areas of very low SEI, development of medium to high impacts are acceptable and mitigation measures may not be required.

Recommended management actions that include mitigation measures to further reduce the impact of the project on the terrestrial biodiversity environment have been outlined in chapter 8. These recommendations must be included in the Environmental Management Plan and as a condition of authorisation.

9.2. Comment on the DFFE Screening Tool Report

9.2.1. ***Animal Species Theme***

The DFFE screening tool report identified the Animal Species Theme as Medium due to the likely presence of the Spotted-necked Otter. Although there was evidence of this species within the PAOI, it is unlikely to use the project area as there is no suitable habitat present. Based on the SEI analysis, the specialist disagrees with the DFFE screening tool report and is of the opinion that the sensitivity should be low rather than medium for the otter.

9.2.2. ***Plant Species Theme***

The DFFE screening tool report identified the Plant Species Theme as Medium due to the likely presence of Sensitive Species 691. The likelihood of occurrence of this species within the PAOI is medium but within the project area is low since no suitable habitat (i.e. wetlands) is present within the project area. As such, the specialist is of the opinion that the sensitivity for the plant species theme should be low rather than medium.

9.2.3. ***Terrestrial Biodiversity Theme***

The DFFE screening tool report identified the Terrestrial Biodiversity Theme as Very High due to the presence of the following sensitive features:

- Critical Biodiversity Area 2 (CBA 2)
- Ecological Support Area 1 (ESA 1)
- National Protected Area Expansion Strategy (NPAES)
- Bushybend Private Nature Reserve
- Vulnerable Ecosystem – Rand Highveld Grassland

Chapter 6 provides comment on how project infrastructure will affect each of these features. Given the small footprint of the facility and heavily degraded nature of the project area, the specialist is of the opinion that the sensitivity for the terrestrial biodiversity theme should be low rather than very high. Furthermore, the specialist is of the opinion that areas disturbed during the construction of the linear infrastructure, such as roads and powerlines, can be successfully rehabilitated within two years of completing construction, provided the recommended mitigation measures are implemented.

9.3. Ecological Statement and Opinion of the Specialist

Given that the project area has a low to very low sensitivity, the specialists are of the opinion that the development can proceed, provided the recommendations contained in this report are implemented.

10. REFERENCES

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Wiesel, I. 2015. *Parahyaena brunnea.* The IUCN Red List of Threatened Species 2015: e.T10276A82344448. https://dx.doi.org/10.2305/IUCN.UK.2015-4.RLTS.T10276A82344448.en. Accessed on 13 June 2023.

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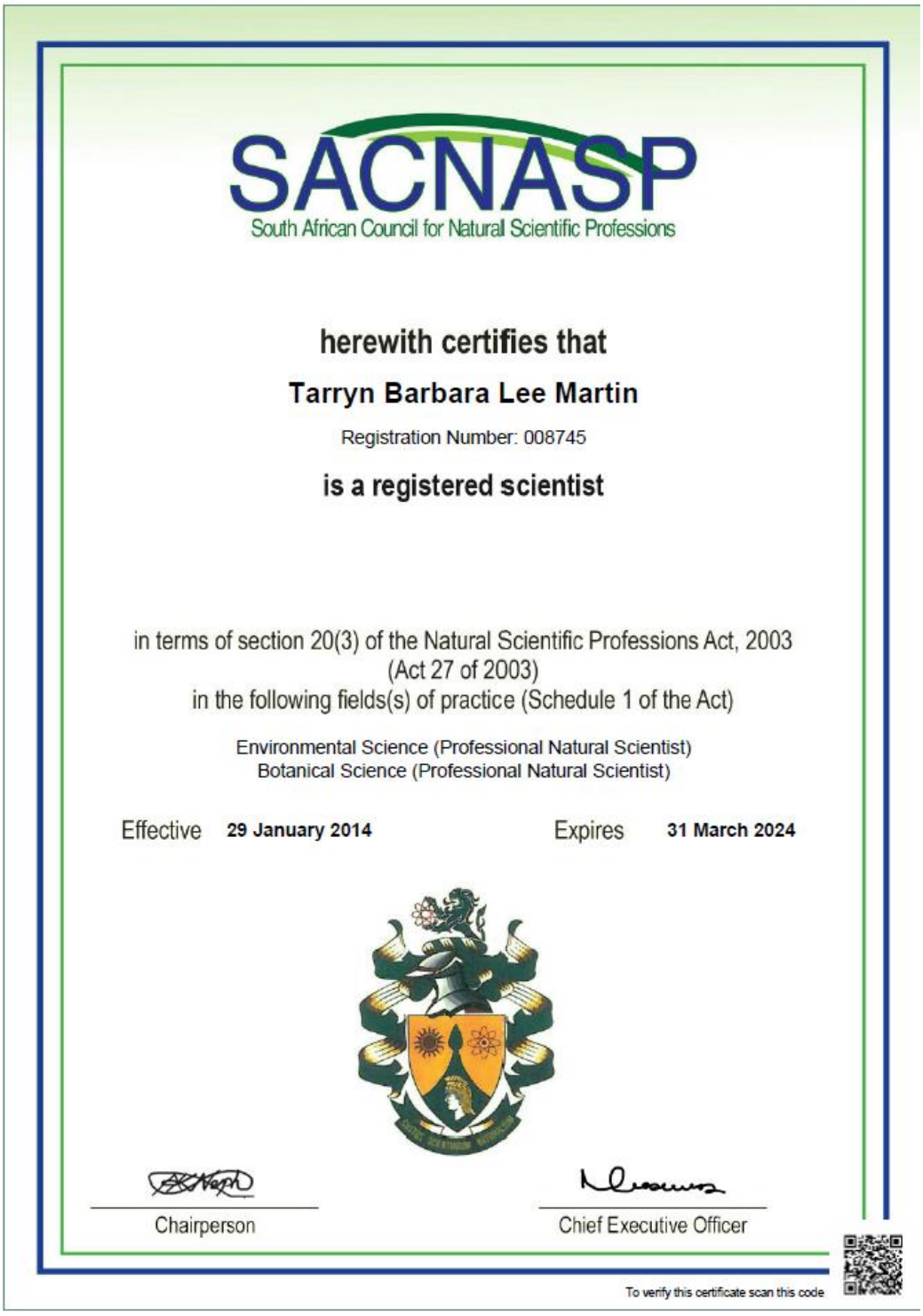
Yarnell RW, Richmond-Coggan L, Bussière E, Williams K, Bissett C, Welch R, Wiesel I. 2016. A conservation assessment of Parahyaena brunnea. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa

APPENDIX 1: SPECIES LIST OF PLANTS RECORDED IN THE PROJECT AREA

Family	*Species*	Threat Status	Free State Nature Conservation Ordinance (1969)	NEMBA	CARA
AMARYLLIDACEAE	*Ammocharis coranica*	LC	Schedule 6 (estimated that there are 20-30 individuals within the project area)		
ASTERACEAE	*Arctotis arctotoides*	LC			
PAPAVERACEAE	*Argemone ochroleuca*	NE		Category 1b	Category 1
POACEAE	*Aristida adscensionis*	LC			
POACEAE	*Aristida congesta*	LC			
ASPARAGACEAE	*Asparagus larcinus*	LC			
ASTERACEAE	*Berkheya onopordifolia*	LC			
ASTERACEAE	*Berkheya radula*	LC			
ASTERACEAE	*Bidens pilosa*	NE			
ASTERACEAE	*Conyza bonariensis*	NE			
POACEAE	*Cymbopogon pospischilii*	NE			
POACEAE	*Cynadon dactylon*	LC			
POACEAE	*Eragrostis curvula*	LC			
POACEAE	*Eragrostis lehmanniana*	LC			
MYRTACEAE	*Eucalyptus grandis*	NE		Category 1b	Category 2
FABACEAE	*Gleditsia triacanthos*	NE		Category 1b	Category 2
AMARYLLIDACEAE	*Haemanthus montanus*	LC	Schedule 6 (estimated that there are 100-150 individuals within the project area)		
ASTERACEAE	*Helichrysum nudifolium*	LC			
ASTERACEAE	*Helichrysum rugulosum*	LC			
MALVACEAE	*Hermannia Sp*				
POACEAE	*Hyparrhenia hirta*	LC			
HYPOXIDACEAE	*Hypoxis hemerocallidea*	LC			

FABACEAE	*Indigofera alternans*	LC			
SOLANACEAE	*Lycium cinereum*	LC			
POACEAE	*Melinis repens*	LC			
SCROPHULARIACEAE	*Nemesia fruticans*	LC			
CACTACEA	*Opuntia ficus-indica*	NE		Category 1b	Category 1
CACTACEA	*Opuntia humifusa*	NE		Category 1b	Category 1
ASTERACEAE	*Pentzia globosa*	LC			
ASTERACEAE	*Senecio consanguineus*	LC			
POACEAE	*Setaria sphacelata*	NE			
ASTERACEAE	*Stoebe plumosum*	LC			
POACEAE	*Themeda triandra*	LC			
FABACEAE	*Vachellia karroo*	LC			
VERBENACEAE	*Verbena aristigera*	NE			
VERBENACEAE	*Verbena litoralis*	NE			
RHAMNACEAE	*Ziziphus mucronata*	LC			

APPENDIX 2: PROOF OF SACNASP REGISTRATION AND HIGHEST QUALIFICATION



SACNASP
South African Council for Natural Scientific Professions

herewith certifies that

Tarryn Barbara Lee Martin

Registration Number: 008745

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)
Botanical Science (Professional Natural Scientist)

Effective **29 January 2014** Expires **31 March 2024**

Chairperson

Chief Executive Officer

To verify this certificate scan this code

RHODES UNIVERSITY

THIS IS TO CERTIFY THAT

TARRYN BARBARA LEE MARTIN

WAS THIS DAY AT A CONGREGATION OF THE UNIVERSITY
ADMITTED TO THE DEGREE OF

MASTER OF SCIENCE

IN

BOTANY

WITH DISTINCTION

VICE CHANCELLOR

DEAN OF THE FACULTY OF SCIENCE

REGISTRAR

GRAHAMSTOWN
10 APRIL 2010

Application for Professional Natural Science in the field of Zoology is currently awaiting approval.

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Amber Leah Jackson
Registration number: 100125/12

is registered as a

Candidate Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule I of the Act)

Environmental Science **15 August 2012**

15 August 2012
Pretoria

President

Executive Director

we certify that

Amber Leah Jackson

was admitted to the degree of

Master of Philosophy

in Environmental Management

on 9 June 2011

Vice-Chancellor

Registrar

APPENDIX 3: CV

CONTACT DETAILS

Name	**Tarryn Martin**
Name of Company	**Biodiversity Africa**
Designation	Director
Profession	Botanical Specialist and Environmental Manager
E-mail	tarryn@biodiversityafrica.com
Office number	+27 (0)71 332 3994
Education	2010: Master of Science with distinction (Botany) 2004: Bachelor of Science (Hons) in African Terrestrial Vertebrate Biodiversity 2003: Bachelor of Science
Nationality	**South African**
Professional Body	**SACNASP**: South African Council for Natural Scientific Profession: Professional Natural Scientist (400018/14) **SAAB**: Member of the South African Association of Botanists **IAIASa**: Member of the International Association for Impact Assessments South Africa Member of Golden Key International Honour Society
Key areas of expertise	• Biodiversity Surveys and Impact Assessments • Environmental Impact Assessments • Critical Habitat Assessments • Biodiversity Management and Monitoring Plans

PROFILE

Tarryn has over ten years of experience working as a botanist, nine of which are in the environmental sector. She has worked as a specialist and project manager on projects within South Africa, Mozambique, Lesotho, Zambia, Tanzania, Cameroon and Malawi.

She has extensive experience writing botanical impact assessments, critical habitat assessments, biodiversity management plans, biodiversity monitoring plans and Environmental Impact Assessments to International Standards, especially to those of the International Finance Corporation (IFC). Her experience includes working on large mining projects such as the Kenmare Heavy Minerals Mine, where she monitored forest health, undertook botanical impact assessments for their expansion projects and designed biodiversity management and monitoring plans. She has also project managed Environmental Impact Assessments for graphite mines in northern Mozambique and has a good understanding of the Mozambique Environmental legislation and processes.

Tarryn holds a BSc (Botany and Zoology), a BSc (Hons) in African Vertebrate Biodiversity and an MSc with distinction in Botany from Rhodes University. Tarryn's Master's thesis examined the impact of fire on the recovery of C_3 and C_4 Panicoid and non-Panicoid grasses within the context of climate change for which she won the Junior Captain Scott-Medal (Plant Science) for producing the top MSc of 2010 from the South African Academy of Science and Art as well as an Award for Outstanding Academic Achievement in Range and Forage Science from the Grassland Society of Southern Africa. Tarryn is a professional member of the South African Council for Natural Scientific Professionals (since 2014).

EMPLOYMENT EXPERIENCE

Director and Botanical Specialist, Biodiversity Africa

July 2021 - present

- Botanical and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping vegetation communities and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Designing rehabilitation plans
- Designing alien management plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets

Principal Environmental Consultant, Branch Manager and Botanical Specialist, Coastal and Environmental Services

May 2012-June 2021

- Botanical and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping vegetation communities and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Designing rehabilitation and biodiversity offset plans
- Designing alien management plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets
- Cape Town branch manager
- Coordinating specialists and site visits

Accounts Manager, Green Route DMC

October 2011- January 2012

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

Camp Administrator and Project Co-ordinator, Windsor Mountain International Summer Camp, USA

April 2011 - September 2012

- Co-ordinated staff and camper travel arrangements, main camp events and assisted with marketing the camp to prospective families.

Freelance Project Manager, Green Route DMC

November 2010 - April 2011

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction.

Camp Counselor, Windsor Mountain Summer Camp, USA

June 2010 - October 2010

NERC Research Assistant, Botany Department, Rhodes University, Grahamstown in collaboration with Sheffield University, Sheffield, England

April 2009 - May 2010

- Set up and maintained experiments within a common garden plot experiment
- collected, collated and entered data
- Assisted with the analysis of the data and writing of journal articles

Head Demonstrator, Botany Department, Rhodes University

March 2007 - October 2008

Operations Assistant, Green Route DMC

September 2005 - February 2007

- Project and staff co-ordination
- Managing large budgets for incentive and conference groups travelling to southern Africa
- Creating tailor-made programs for clients
- Negotiating rates with vendors and assisting with the ground management of inbound groups to ensure client satisfaction

PUBLICATIONS

- Ripley, B.; Visser, V.; Christin, PA.; Archibald, S.; Martin, T and Osborne, C. Fire ecology of C_3 and C_4 grasses depends on evolutionary history and frequency of burning but not photosynthetic type. *Ecology.* 96 (10): 2679-2691. 2015
- Taylor, S.; Ripley, B.S.; Martin, T.; De Wet, L-A.; Woodward, F.I.; Osborne, C.P. Physiological advantages of C_4 grasses in the field: a comparative experiment demonstrating the importance of drought. *Global Change Biology*. 20 (6): 1992-2003. 2014
- Ripley, B; Donald, G; Osborne, C; Abraham, T and Martin, T. Experimental investigation of fire ecology in the C3 and C4 subspecies of *Alloteropsis semialata. Journal of Ecology.* 98 (5): 1196 - 1203. 2010
- South African Association of Botanists (SAAB) conference, Grahamstown. Title: Responses of C3 and C4 Panicoid and non-Panicoid grasses to fire. January 2010
- South African Association of Botanists (SAAB) conference, Drakensberg. Title: Photosynthetic and Evolutionary determinants of the response of selected C3 and C4 (NADP-ME) grasses to fire. January 2008

COURSES

- Rhodes University and CES, Grahamstown
- EIA Short Course 2012
- Fynbos identification course, Kirstenbosch, 2015.
- Photography Short Course, Cape Town School of Photography, 2015.
- Using Organized Reasoning to Improve Environmental Impact Assessment, 2018, International IAIA conference, Durban

CONSULTING EXPERIENCE

International Projects

- 2020 – 2021: Project manager for the 2Africa subsea cable ESIA in Mozambique.
- 2020 – 2021: Project manager for the Category B EIA for the Wihinana Graphite Mine, Cabo delgado, Mozambique
- 2020 – 2021: Project manager for the category B exploration ESIA for Sofala Heavy Minerals Mine, Inhambane, Mozambique
- 2020: Critical Habitat Assessment for a graphite mine in Cabo Delgado, Mozambique. This assessment was to IFC standards.
- 2020: Analysed the botanical dataset for Lurio Green Resources and provided comment on the findings and gaps.
- 2020: Biodiversity Management Plan and Monitoring Plan for mine at Pilivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
- 2019: Botanical Assessment for a cocoa plantation, Tanzania. This assessment was to IFC standards.

- 2019: Critical Habitat Assessment, Biodiversity Management Plan and Ecosystem Services Assessment for JCM Solar Farm in Cameroon. This assessment was to IFC standards.
- 2019: Undertook the Kenmare Road and Infrastructure Botanical Baseline Survey and Impact Assessment for an infrastructure corridor that will link the existing mine at Moma to the new proposed mine at Pillivilli in Nampula Province, Mozambique. This assessment was to IFC standards.
- 2012 – Present: Kenmare Terrestrial Monitoring Program Project Manager and Specialist Survey, Nampula Province, Mozambique.
- 2018: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Balama Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
- 2018: Co-authored the critical habitat assessment chapter for the proposed Kenmare Pilivilli Heavy Minerals Mine.
- 2018: Authored the Conservation Efforts chapter for the Kenmare Pilivilli Heavy Minerals Mine.
- 2017-2018: Co-authored and analysed data for the Kenmare Bioregional Survey of *Icuria dunensis* (species trigger for critical habitat) in Nampula Province, Mozambique. This was for a mining project that needed to be IFC compliant.
- 2017: Conducted a field survey and wrote a botanical report to IFC standards for the proposed Ancuabe Graphite Mine Environmental and Social Impact Assessment (ESIA) in Cabo Delgado Province, Mozambique.
- 2017-2018: Managed the Suni Resources Montepuez Graphite Mine Environmental Impact Assessment. This included the management of ten specialists, the co-ordination of their field surveys, regular client liaison and the writing of the Environmental Impact Assessment Report which summarised the specialists findings, assessed the impacts of the proposed mine on the environment and provided mitigation measures to reduce the impact.
  I was also the lead botanist for this baseline survey and impact assessment and undertook the required field work and analysed the data and wrote the report.
- 2017: Undertook the botanical baseline survey and impact assessment for the proposed Kenmare Pilivili Heavy Mineral Mine in Nampula Province, Mozambique. This was to IFC Standards.
- 2017: Ecological Survey for the Megaruma Mining Limitada Ruby Mine Exploration License, Cabo Delgado, Mozambique.
- 2016: Undertook the botanical baseline survey and impact assessment, wrote an alien invasive management plan and co-authored the biodeiveristy monitoring plan for this farm. The project was located in Zambezia Province, Mozambique.
- 2015-2016: Conducted the Triton Minerals Nicanda Hills Graphite Mine Botanical Survey and Impact Assessment. Was also the project manager and specialist co-ordinator for this project. The project was located in Cabo Delgado Province, Mozambique.
- 2015: Was part of the team that undertook a Critical Habitat Assessment for the Nhangonzo Coastal Stream site at Inhassora in Mozambique that Sasol intend to establish drill pads at. This project needed to meet the IFC standards.
- 2014: Lurio Green Resources Wood Chip Mill and Medium Density Fibre-board Plant, Project Manager and Ecological Specialist, Nampula Province, Mozambique. 2014-2015.
- 2013-2014: LHDA Botanical Survey, Baseline and Impact assessment, Lesotho.
- 2014: Biotherm Solar Voltaic Ecological Assessment, Zambia.
- 2013-2014: Lurio Green Resources Plantation Botanical Assessment, Vegetation and Sensitivity Mapping, Specialist Co-ordination, Nampula Province, Mozambique.
- 2013: Syrah Resources Botanical Baseline Survey and Ecological Assessment., Cabo Delgado Mozambique.
- 2013-2014: Baobab Mining Ecological Baseline Survey and Impact Assessment, Tete, Mozambique.

South African Projects

- 2021 - Present: Project Manager for the Sturdee Energy Solar PV facility, Western Cape
- 2021: Ecological Assessment for the Sturdee Energy Solar PV facility, Western Cape
- 2021: Rehabilitation plan for a housing development (Hope Village)
- 2020: Ecological Assessment for the Eskom Juno-Gromis Powerline deviation, Western Cape
- 2020: Project Manager for the Basic Assessment for SANSA development at Matjiesfontein (Western Cape). Project received authorization in 2021.
- 2020: Ecological Assessment for construction of satellite antennae, Matjiesfontein, Western Cape
- 2019: Ecological Assessment for a wind farm EIA, Kleinzee, Northern Cape
- 2019: Ecological Assessment for two housing developments in Zeerust, North West Province
- 2019: Botanical Assessment in Retreat, Cape Town for the DRDLR land claim.
- 2019: Cape Agulhas Municipality Botanical Assessment for the expansion of industrial zone, Western Cape, South Africa, 2019.
- 2018: Ecological Assessment for the construction of a farm dam in Greyton, Western Cape.
- 2018: Conducted the Ecological Survey for a housing development in Noordhoek, Cape Town
- 2018: Conducted the field survey and developed an alien invasive management plan for the Swartland Municipality, Western Cape.
- 2017: Undertook the field survey and co-authored a coastal dune study that assesses the impacts associated with the proposed rezoning and subdivision of Farm Bookram No. 30 to develop a resort.
- 2017: Project managed and co-authored a risk assessment for the use of Marram Grass to stabilise dunes in the City of Cape Town.
- 2015-2016: iGas Saldanha to Ankerlig Biodiversity Assessment Project Manager, Saldanha.
- 2015: Innowind Ukomoleza Wind Energy Facility Alien Invasive Management Plan, Eastern Cape Province, South Africa.
- 2015: Savannah Nxuba Wind Energy Facility Powerline Ecological Assessment, ground truthing and permit applications, Eastern Cape South Africa.
- 2014: Cob Bay botanical groundtruthing assessment, Eastern Cape, South Africa.
- 2013-2016: Dassiesridge Wind Energy Facility Project Manager, Eastern Cape, South Africa.
- 2013: Harvestvale botanical groundtruthing assessment, Eastern Cape, South Africa.
- 2012: Tsitsikamma Wind Energy Facility Community Power Line Ecological Assessment, Eastern Cape, South Africa.
- 2012: Golden Valley Wind Energy Facility Power Line Ecological Assessment, Eastern Cape, South Africa.
- 2012: Middleton Wind Energy Facility Ecological Assessment and Project Management, Eastern Cape, South Africa.
- 2012: Mossel Bay Power Line Ecological Assessment, Western Cape, South Africa.
- 2012: Groundtruthing the turbine sites for the Waainek Wind Energy Facility, Eastern Cape, South Africa.
- 2012: Toliara Mineral Sands Rehabilitation and Offset Strategy Report, Madagascar.

CONTACT DETAILS

Name	**Amber Jackson**
Name of Company	**Biodiversity Africa**
Designation	Director
Profession	Faunal Specialist and Environmental Manager
E-mail	amber@biodiversityafrica.com
Office number	+27 (0)78 340 6295
Education	2011 M. Phil Environmental Management (University of Cape Town) 2008 BSc (Hons) Ecology, Environment and Conservation (University of the Witwatersrand) 2007 BSc 'Ecology, Environment and Conservation' and Zoology (WITS)
Nationality	**South African**
Professional Body	**SACNASP**: South African Council for Natural Scientific Profession (100125/12) **ZSSA**: Zoological Society of Southern Africa **HAA**: Herpetological Association of Southern Africa **IAIASa**: Member of the International Association for Impact Assessments South Africa
Key areas of expertise	• Biodiversity Surveys and Impact Assessments • Environmental Impact Assessments • Critical Habitat Assessments • Biodiversity Management and Monitoring Plans

PROFILE

Amber has over ten years' experience in environmental consulting and has managed projects across various sectors including mining, agriculture, forestry, renewable energy, housing, coastal and wetland recreational infrastructure. Most of these projects required lender finance and therefore met both in-country, lender and sector specific requirements.

Amber completed the IFC lead and Swiss funded programme in Environmental and Social Risk Management course in 2018. The purpose of the course was to upskill Sub-Saharan African environmental consultants to increase the uptake of E&S standards by Financial Institutions.

Amber specialises in terrestrial vertebrate faunal assessments. She has conducted large scale faunal impact assessments that are to international lender's standards in Mozambique, Tanzania, Lesotho and Malawi. In South Africa her faunal impact assessments comply with the protocols for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity and follows the SANBI Species Environmental Assessment Guideline. Her specialist input goes beyond impact assessments and includes faunal opportunities and constraints assessments, Critical Habitat Assessments, Biodiversity related Management Plans and Biodiversity Monitoring Programmes.

Amber holds a BSc (Zoology and Ecology, Environment & Conservation) and BSc (Hons) in Ecology, Environment & Conservation from WITS University and an MPhil in Environmental Management from University of Cape Town. Amber's honours focused on the landscape effects on Herpetofauna in Kruger National Park and her Master's thesis focused on the management of social and natural aspects of environmental systems with a dissertation in food security that investigated the complex food system of informal and formal distribution markets

EMPLOYMENT EXPERIENCE

Director and Faunal Specialist, Biodiversity Africa

July 2021 - present

- Faunal assessments for local and international EIAs in Southern Africa
- Identifying and mapping habitats and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Critical Habitat Assessments
- Large ESIA studies
- Managing budgets

Principal Environmental Consultant and Faunal,

Coastal and Environmental Services

September 2011-June 2021

- Faunal and ecological assessments for local and international EIAs in Southern Africa
- Identifying and mapping habitat and sensitive areas
- Designing and implementing biodiversity management and monitoring plans
- Critical Habitat Assessments
- Large ESIA studies
- Coordinating specialists and site visits
- Faunal Impact Assessment
- Project Management, including budgets, deliverables and timelines.
- Environmental Impact Assessments and Basic Assessments project
- Environmental Control Officer
- Public/client/authority liaison
- Mentoring and training of junior staff

COURSES

- **Herpetological Association of Southern Africa Conference- Cape St Frances** September 2019
- **International Finance Corporation Environmental and Social Risk Management (ESRM) Program** January – November 2018
- **IAIA WC EMP Implementation Workshop** 27 February 2018
- **IAIAsa National Annual Conference** August 2017
  Goudini Spa, Rawsonville.
- **Biodiversity & Business Indaba, NBBN** April 2017
  Theme: Moving Forward Together (Partnerships & Collaborations)
- **Snake Awareness, Identification and Handling course, Cape Reptile Institute (CRI)** November 2016
- **Coaching Skills programme, Kim Coach** November 2016
- **Western Cape Biodiversity Information Event, IAIAsa** May 2016
  Theme: Biodiversity offsets & the launch of a Biodiversity Information Tool
- **Photography Short Course** 2015.
  Cape Town School of Photography,
- **Mainstreaming Biodiversity into Business: WHAT, WHY, WHEN and HOW** June 2014 Hosted by Dr Marie Parramon Gurney on behalf of the NBBN at the Rhodes Business School
- **IAIAsa National Annual Conference** September 2013
  Thaba'Nchu Sun, Bloemfontein
- **St Johns Life first aid course** July 2012

CONSULTING EXPERIENCE

International Projects

- 2018-Crooks Brothers Post EIA Work- Environmental and Social EMPr, Policies, E&S Management Plans and Monitoring Programmes
- 2018-Triton Ancuabe Graphite Mine (ESHIA), Mozambique. IFC Standards.
- 2016-Bankable Feasibility Study of Simandou Infrastructure Project – Port and Railway Summary of critical habitat, biodiversity offset plan and monitoring and evaluation plan.
- 2016-Lurio Green Resources Forestry Projects ESIA project upgrade to Lender standards including IFC, EIB, FSC and AfDB.
- 2014-Green Resources Woodchip and MDF plant (EPDA).
- 2014-Niassa Green Resources Forestry Projects ESIA to Lender standards including IFC, EIB, FSC and AfDB.

- 2020-Kenmare Faunal Biodiversity Management Plan, Mozambique.
- 2020-Kenmare Faunal Monitoring Pogramme (year 1)- Baseline, Mozambique.
- 2019-Kenmare addendum ESIA Faunal Impact Assessment, Mozambique.
- 2019-Kenmare infrastructure corridor ESIA Faunal Impact Assessment, Mozambique.
- 2019/20-Olam Cocoa Plantation Faunal Impact Assessment, Tanzania.
- 2019-JCM Solar Voltaic project Faunal desktop critical habitat assessment, Cameroon.
- 2018-Suni Resources Balama Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017/18-Battery Minerals Montepuez Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017-Triton Minerals Nicanda Hills Graphite Mine Project Faunal Impact Assessment, Mozambique.
- 2017-Sasol Biodiversity Assessment, Mozambique.
- 2014-Lesotho Highlands Water Project Faunal Impact Assessment, Lesotho.
- 2012-Malawi Monazite mine Projects (ESIA) EMP ecological management contribution
- Liberia Palm bay & Butow (ESIA)
- PGS Seismic Project (ESIA), Mozambique.

South African Projects

- 2018-Port St Johns Second Beach Coastal Infrastructure Project - E&S Risk Assessment
- 2015-Blouberg Development Initiative- E&S Risk Assessment
- 2019-Boulders Powerline BA Faunal desktop impact assessment, WC, SA.
- 2019-Ramotshere housing development BA Faunal desktop impact assessment, NW, SA.
- 2019-Cape Agulhas Municipality Industrial development faunal impact assessment, WC, SA.
- 2019-SANSA Solar PV BA Faunal desktop impact assessment, WC, SA.
- 2019-Wisson Coal to Urea Faunal desktop assessment, Mpumalanga.
- 2019-Assessment Boschendal Estate Faunal Opportunities and Constraints, WC, SA.
- 2019-Ganspan-Pan Wetland Reserve Recreational and Tourist Development Avifaunal Impact Assessment, NC, SA.
- 2018-City of Johannesburg Municipal Reserve Proclamation for Linksfield Ridge and Northcliff Hill Faunal Assessment, South Africa.
- 2017-Augrabies falls hydro-electric project Hydro-SA Faunal Impact Assessment.
- Port St Johns Second Beach Coastal Infrastructure Project (EIA), South Africa.
- Woodbridge Island Revetment checklist.
- Belmont Valley Golf Course and Makana Residential Estate (EIA)
- Belton Farm Eco Estate (BA).
- Ramotshere housing development (BA).
- G7 Brandvalley Wind Energy Project (EIA)
- G7 Rietkloof Wind Energy Project (EIA)
- G7 Brandvalley Powerlines (BA)
- G7 Rietkloof Powerlines (BA)
- Boschendal wine estate Hydro-electric schemes (BA, 24G and WULA)
- Mossel Bay Wind Energy Project (EIA)
- Mossel Bay Powerline (BA) 132kV interconnection
- Inyanda Farm Wind Energy (EIA)
- Middleton Wind Energy (EIA)
- Peddie Wind Energy (EIA)

- Cookhouse Wind Energy Project (EIA)
- Haverfontein Wind Energy Project (EIA)
- Plan 8 Wind Energy Project (EIA)
- Brakkefontein Wind Energy Project (EIA)
- Grassridge Wind Energy Project (EIA) (Coega)
- St Lucia Wind Energy Project (EIA)
- ACSA ECO CT (Lead ECO)
- Enel Paleisheuwel Solar farm (Lead ECO)
- NRA Caledon road upgrade ECO
- Solar Capital DeAar Solar farm annual audits
- Eskom Pinotage substation WUL offset compliance