UPGRADE ENERGY (PTY) LTD

PROPOSED 132KV POWERLINE FROM LEEUBOSCH TRACTION SUBSTATION TO THE VAAL REEF TEN SUBSTATION, MAQUASSI HILLS LOCAL MUNICIPALITY, NORTHWEST PROVINCE

Terrestrial Ecological, Plant and Animal Site Verification, Compliance and Confirming Statement

Issue Date:	October 2022
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Date:	10 November 2022
Document Title:	Proposed 132kv Powerline from Leeubosch Traction Substation to The Vaal Reef Ten Substation, Maquassi Hills Local Municipality, Northwest Province: Terrestrial Ecological, Plant and Animal Site Verification, Compliance and Confirming Statement
Revision Number:	**1.0**
Author:	**Mark Summers (Cand.Sci.Nat; Reg No. 120309)** B.Sc. Honours Zoological Science M.Sc. Ecological Science
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Signature:	
Client:	Upgrade Energy (Pty) Ltd

Confidentiality Statement

UPGRADE ENERGY (PTY) LTD

LEEUDORINGSTAD 132KV POWERLINE AND ASSOCIATED INFRASTRUCTURE

TERRESTRIAL ECOLOGICAL, PLANT AND ANIMAL SITE VERIFICATION, COMPLIANCE AND CONFIRMING STATEMENT

TABLE OF CONTENTS

TABLES

FIGURES

SPECIALISTS DECLARATION

I, Mark Summers as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- act as the independent specialist in this application;
- 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- 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;
- will comply with the Act, Regulations and all other applicable legislation;
- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- have no vested interest in the proposed activity proceeding;
- 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;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of specialist:

Name of specialist: Mark Summers
Date: 10 November 2022

SPECIALISTS DECLARATION

I, Dacre James Alletson as the appointed independent specialist, in terms of the 2014 EIA Regulations, hereby declare that I:

- act as the independent specialist in this application;
- 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;
- regard the information contained in this report as it relates to my specialist input/study to be true and correct, and do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- declare that there are no circumstances that may compromise my objectivity in performing such work;
- 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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- have no, and will not engage in, conflicting interests in the undertaking of the activity;
- have no vested interest in the proposed activity proceeding;
- 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;
- have ensured that information containing all relevant facts in respect of the specialist input/study was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments on the specialist input/study;
- have ensured that the comments of all interested and affected parties on the specialist input/study were considered, recorded and submitted to the competent authority in respect of the application;
- all the particulars furnished by me in this specialist input/study are true and correct; and
- realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

Signature of specialist:

Name of specialist: D.J. Alletson
Date: 10 November 2022

COMPLIANCE WITH TERRESTRIAL ECOLOGICAL PROTOCOLS AS PER GN. 320 OF 20 MARCH 2020

Reporting requirements of a Terrestrial Ecological Compliance Statement	Section of specialist report addressing requirement
4.1. The compliance statement must be prepared by a specialist registered with the SACNASP and having expertise in the field of ecological sciences.	Appendix 1
4.2. The compliance statement must:	
4.2.1. be applicable to the preferred site and proposed development footprint;	Section 11
4.2.2. confirm that the site is of "low" sensitivity for terrestrial biodiversity; and	Section 7 and Section 8
4.2.3. indicate whether or not the proposed development will have any impact on the biodiversity feature.	Section 7 Section 8 8 and Section 9
4.3. The compliance statement must contain, as a minimum, the following information:	
4.3.1. the contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	Appendix 1
4.3.2. a signed statement of independence by the specialist;	Specialist Declaration
4.3.3. a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 4
4.3.4. a baseline profile description of biodiversity and ecosystems of the site;	Section 6, Section 7 and Section 8
4.3.5. the methodology used to verify the sensitivities of the terrestrial biodiversity features on the site, including equipment and modelling used, where relevant;	Section 4
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 11
4.3.7. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr;	Section 9
4.3.8. a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	Assumptions and limitations
4.3.9. any conditions to which this statement is subjected.	Section 9

COMPLIANCE WITH SPECIES SPECIFIC PROTOCOLS AS PER GN. 1150 OF 30 OCTOBER 2020

Reporting requirements of a Terrestrial Animal / Plant Compliance Statement	Section of specialist report addressing requirement
5.1 The compliance statement must be prepared by a SACNASP registered specialist under one of the two fields of practice (Zoological Science / Botanical Science or Ecological Science).	Appendix 1
5.2 The compliance statement must:	
5.2.1 be applicable to the study area;	Section 3
5.2.2 confirm that the study area, is of "low" sensitivity for terrestrial animal / plant species; and	Section 7 and Section 8
5.2.3 indicate whether or not the proposed development will have any impact on SCC.	Section 7 Section 8 and Section 9
5.3 The 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;	Appendix 1
5.3.2 a signed statement of independence by the specialist;	Specialist Declaration
5.3.3 a statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	Section 4
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;	Section 4
5.3.5 the mean density of observations/ number of samples sites per unit Area.	Section 4
5.3.6 where required, proposed impact management actions and outcomes or any monitoring requirements for inclusion in the EMPr;	Section 9
5.3.7 a description of the assumptions made and any uncertainties or gaps in knowledge or data; and	Assumptions and limitations

5.3.8 any conditions to which the compliance statement is subjected.	Section 9

COMPLIANCE WITH APPENDIX B.1 OF THE STANDARD AND EXPANSION OF POWER LINES AND SUBSTATIONS WITHIN IDENTIFIED GEOGRAPHICAL AREAS REVISION 2 (DFFE, 2022)

Reporting requirements of a Terrestrial Ecological Confirming Statement	Section of specialist report addressing requirement
1. A statement on the duration, date and season of the site verification inspection and walkthrough as well as the relevance of the season to the outcome of the confirming statement;	Section 4, Section 11
2. Confirmation that the terrestrial ecology (flora and fauna) within the final pre-negotiated route and/or the substation location is low based on the most recently available desktop data, site verification inspection and walk through;	Section 7, Section 8, Section 9, Section 10, Section 11
3. Identification of terrestrial ecological areas to be avoided within the final pre-negotiated route, including buffers and/or the substation location	Section 8.1, Section 9.7, Section 11
4. A terrestrial biodiversity sensitivity map, generated by the screening tool and enhanced by any relevant additional information including the walkthrough, overlaid with the proposed development footprint (i.e. pylon placement and power line route, as well as supporting infrastructure);	Not required, Section 11
5. A description on how the identified environmental sensitivity, relating to terrestrial ecology, has been considered in determining the final pre-negotiated route and/or the substation location;	Section 7, Section 8, Section 9, Section 10, Section 11
6. A description on how the identified engineering constraints, relating to terrestrial ecology, have been considered in determining the preferred route	Section 7, Section 8, Section 9, Section 10, Section 11
7. A description of the implementation of the mitigation hierarchy in order to determine the final pre-negotiated route and/or substation location;	Section 9, Section 11
8. How the comments from interested and affected parties on the proposed route and/or substation location were incorporated; and	No comments received on report, Section 11
9. A statement confirming that: a. impact management actions as contained in the pre-approved Generic EMPr template are sufficient for the avoidance, management and mitigation of impacts and risks; or b. where required, specific impact management outcomes and actions are required and have been provided as part of the site specific EMPr.	Section 10 and Section 11

ASSUMPTIONS AND LIMITATIONS

The following assumptions, limitations, uncertainties are listed regarding the ecological assessment of the site:

- The study was undertaken within the growing season, however large rainfall events had not occurred prior to sampling.
- Rare and threatened plant species are, by their nature, usually very difficult to locate and can be easily missed.
- This study has only focused on the identification of faunal species that may occur on site, or were noted on site during fieldwork. Night time surveying was not undertaken due to budgetary constraints.
- Access to the entire site was limited due to locked farm gates, therefore data was collected where access allowed and this was used to extrapolate results over the proposed development.

UPGRADE ENERGY (PTY) LTD

LEEUDORINGSTAD 132KV POWERLINE AND ASSOCIATED INFRASTRUCTURE

TERRESTRIAL ECOLOGICAL, PLANT AND ANIMAL SITE VERIFICATION, COMPLIANCE AND CONFIRMING STATEMENT

1 INTRODUCTION

Upgrade Energy proposes the construction of a 42km long 132kV Powerline from the approved Leeuwbosh Traction Substation in support of the approved Leeubosch Solar Photo Voltaic (SPV) Facility in Leeudoringstad to the Vaal Reef Ten Substation, within the Maquassi Hills Local Municipality, Northwest (NW) Province.

SiVEST SA (Pty) Ltd, has been appointed to undertake a Terrestrial Ecological, Plant and Animal Site Verification and Compliance Statement in line with GN 320 (20 March 2020) and GN 1150 (30 October 2020) of the National Environmental Management Act (NEMA) EIA Regulation of 2014. Prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The Department of Forestry Fisheries and Environment (DFFE) Screening Tool report has highlighted Terrestrial Biodiversity as a “Very High Sensitivity” rating, Animal Species Theme as “High Sensitivity” rating and Plant Species Theme as “Medium Sensitivity” rating. This sensitivity verification report has been compiled to determine whether a compliance statement, or Terrestrial Biodiversity Impact Assessment is required. The site inspection confirmed that a compliance statement was to be followed.

Upon undertaking the above assessment, the project was noted to occur within a Strategic Transmissions corridor, therefore compliance with the Standard for the Development and Expansion of Power Lines and Substations within Identified Geographical Areas is required (DFFE 2022). This has been specifically addressed in Section 11 of the report.

2 BACKGROUND

Upgrade Energy has received Environmental Authorisation for the proposed Leeudoringstad SPV facilities, therefore a 132kV powerline is required in order to provide the connection to the SPV’s. Two powerline options have been provided within a 500m corridor, namely the Preferred Alternative 1, and the Alternative 2 (**Figure 1**). The two alternatives run parallel to an existing 132kV powerline and 400kV powerline (**Figure 1**).

The technical details of the proposed powerline have been provided by Upgrade Energy and are as follows:

Table 1: Technical Detail Summary

Aspect	Description
Project location	Located near Leeudoringstad in North West Province, within the Maquassi Hills Local Municipality, of the Dr Kenneth Kaunda District Municipality, North West Province
Number/Types of powerlines required (Single/Double circuit)	Either Single or Double Circuit (Most likely a single tern conductor)
Which Eskom Substation or powerline will the facility tie into for electricity evacuation into the grid?	The powerline will comprise of a 132kV powerline to connect the Leeuwbosch Traction Substation to the Vaal Reef Ten Substation.
Scope of work at IPP Substation	• Install a compact 132/33kV transformer substation with the associated protection equipment • Install 2x33kV containerized switchgear
The scope of work in the Leeubosch substation	• Install 1 x 132kV feeder bays at Leeubosch substation to accommodate the IPP compact 132/33kV substation • Establish a completely new 132 kV single busbar • Build approximately 32 km of a single circuit Tern line from Leeubosch substation to New 132kV Collector at Orkney Solar Farm
The scope of work at the 132 kV Collector Station close to the Orkney Solar Farm	• Establish a new 132kV single busbar collector substation • Build 2 x 132 kV feeder bays to connect the Leeudoringstad IPP and Orkney Solar Farm. • Build approximately 10 km of double circuit Twin Tern line from the new collector station to the VaalReef Ten substation
The scope of work at the VaalReef Ten substation	• Equip 1 x 132 kV feeder bay for a 10 km double circuit Twin Tern line
Details of the proposed grid infrastructure and footprints for proposed powerlines	The proposed powerline (up to and including 132kV) to Vaal Reef Ten Power Station will be ~42km long depending on the exact route options. The servitude width for a 132 kV distribution line is 31 m (15.5 m on either side of the centre line of the power line)
IPP Substation & Eskom switching station	Substation consisting of combined IPP 132/33kV step-up substation and Eskom switching substation. The IPP Substation acts as a collector substation for the 33kV feeders and steps-up the voltage from 33kV to 132kV. This will be connected to an adjacent Vaal ten reef Eskom 132kV Switching Substation. The collected 33kV power will be stepped up to 132kV using a single 1 x 33/132kV 60MVA step-up substation. A new Eskom 132kV switching station will be built adjacent to the step-up substation. The substation will be demarcated into three (3) sections: the 33kV substation, 33/132kV IPP step-up substation and the 132kV Eskom Switching Station. Eskom metering and operations will take place inside the Eskom switching yard. The 33kV collector substation will consist of a prefabricated building mounted on a concrete support beams. The building shall include: • 33kV Switchgear Room • Control Room • Battery Room • The collector substation shall be air conditioned building with necessary fire and gas detectors. The cable entry to the building shall be from bottom. The IPP Step-up substation will include a 1 x 60MVA 132/33kV power transformer, 1 x NECRT and other associated HV equipment.
Competent Authority and motivation	As the Project constitutes associated infrastructure to projects related to the IRP and is located within an EGI corridor, the DFFE is the CA.
Powerline pylon height	TBC
Site Access	Access to the facility will be via an existing gravel road which connects to the tarred R502 road. Existing site roads will be used wherever possible. However, where required, new internal access roads will be constructed.

Aspect	Description
	The 132kV powerline follows the R502.

3 LOCATION

The project site falls within the Maquassi Hills Local Municipality within the Dr Kenneth Kaunda District Municipality in the NW Province. The site is accessible via an existing gravel road which branches off the tarred R502 Provincial Road. The powerline is proposed to start at the Leeudoringstad SPV facilities (27°12'12.4"S; 26°18'29.9"E) and end at the Vaal Reef Ten Substation (26°59'52.10"S; 26°36'55.37"E) which is approximately 42km of powerline depending on the alternative powerline options (see **Figure 1** below).

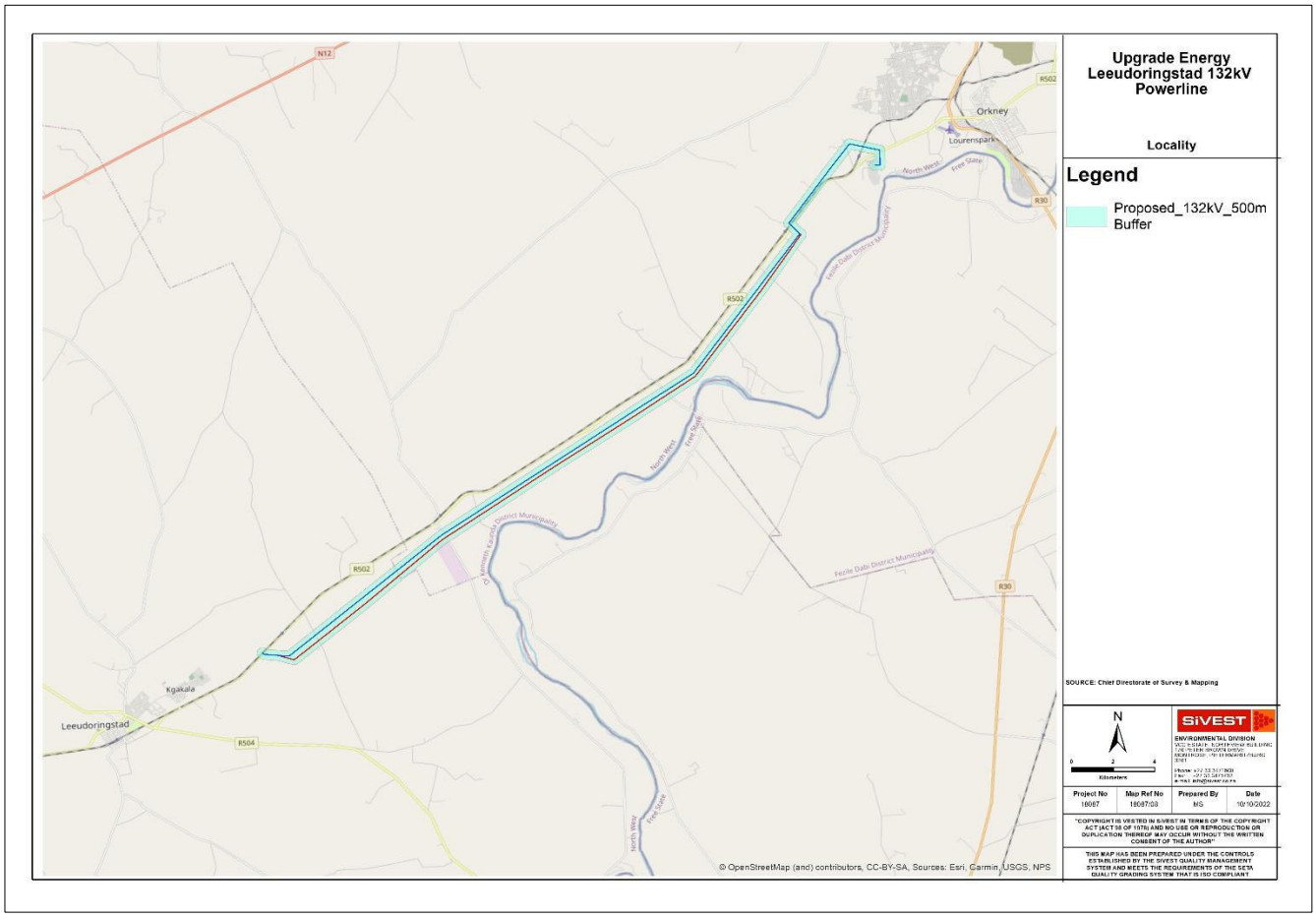

Figure 1: Site locality of the proposed powerline alternatives.

4 SITE VISIT AND SAMPLING METHODOLOGY

The site visit was undertaken in October 2022. Sampling was undertaken in the recommended sampling season for the biome type – Grassland / savanna (**Figure 2**), as per the Species Environmental Assessment Guidelines (SANBI, 2020). Although rainfall had been sparse prior to the site inspection, the vegetation was still in a moderate to good state, allowing for many indicator species to be identified and a high confidence in the results.

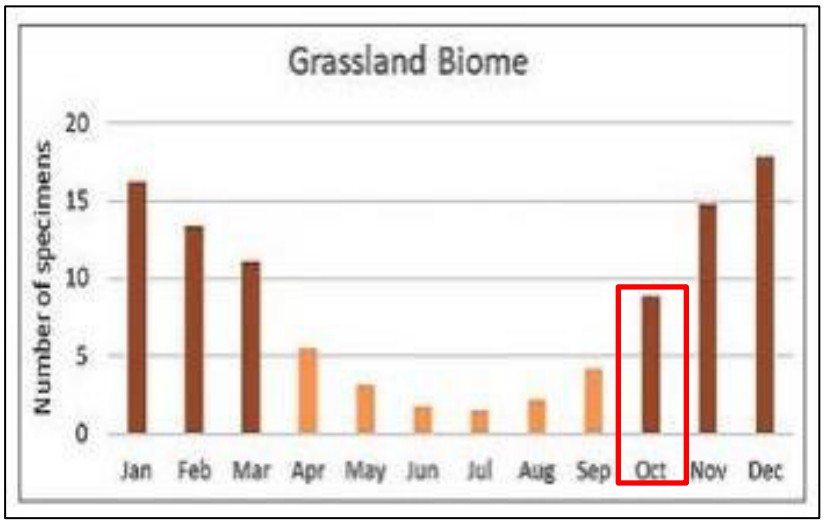

Figure 2: Sampling was undertaken in October which is considered the growing season (SANBI, 2020).

This report's findings are based on a desktop study to determine the species that have been recorded in the area before; and a site visit to determine species presence and habitat suitability. The desktop study included the use of a variety of online and GIS databases. These resources were used to determine whether the species range or ecosystem type were present on site and in the surrounding area, with particular attention being paid to species and ecosystems listed by the DFFE screening tool. The databases consulted can be found in

Table 2.

Table 2: Databases Consulted in the Terrestrial Ecological Assessment

Database
Department of Rural Development and Land Reform CDNGI Geospatial Portal: Historical Imagery
Department of Forestry Fisheries and Environment: Screening Tool
North West Biodiversity Sector Plan
• Terrestrial CBA / ESA
• Aquatic CBA / ESA
South African National Biodiversity Institute: Plants of South Africa (POSA)
South African National Biodiversity Institute: Threatened Ecosystems
South African National Biodiversity Institute: Protected Areas Expansion System
South African Protected Areas Database (Q1 2022)
South African Conservation Areas Database (Q1 2022)
iNaturalist
VegMAP 2018
Animal Demographic Unit
• ReptileMAP
• FrogMAP
• MammalMAP
• LepiMAP

A site inspection was undertaken with the purpose of determining whether:

- Threatened Ecosystems are present on site;
- Ecological Corridors are present on site;
- Any Species of Conservation Concern (SCC) were present on or near the proposed development;
- The proposed site acts as a corridor for SCC highlighted by the screening tool; and
- Any SCC not highlighted by the screening tool that may occur on site.

5 RELEVANT LEGISLATION AND PERMIT REQUIREMENTS

The following legislation was consulted:

- National Environmental Management Act, Act No. 107 of 1998 (NEMA);
- National Forests Act (Act No. 84 of 1998);
- Terrestrial Plant and Animal Species Protocols, Government Notice No. 1150 of 30 October 2020;
- Terrestrial Ecological Protocols, Government Notice No. 320 of 20 March 2020;
- Environment Conservation Act No. 73 of 1989, Amendment Notice No. R1183 of 1997;
- National Environmental Management: Biodiversity Act (Act No. 10 of 2004);
- National Environmental Management: Protected Areas Act (Act No. 57 of 2003);
- Conservation of Agricultural Resources (Act No. 43 of 1983) as amended in 2001;
- North West Biodiversity Management Act (Act No. 4 of 2016);
- International Union for Conservation of Nature (IUCN).

Permit / Licence requirements:
In terms of the National Forests Act, 1998 (Act No. 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act, 1984 (Act No. 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants; or, 3 or more indigenous trees whose crowns are largely contiguous will require a Department of Agriculture, Fisheries and Forestry (DAFF) licence.

Protected indigenous plants and animals in general are controlled under the relevant provincial Acts dealing with nature conservation. In the North West Province the relevant Act is the 2016 North West Biodiversity Management Act. The Act provides a list of protected species in Schedule 2, which requires that the removal of any species on the list will require permission from the Issuing Authority.

For a full list of legislation requirements, please contact the Specialist.

6 HISTORICAL CONTEXT

Historical context is important to note as this allows for an overview on what historical disturbances may have occurred in the general area, and what effect this may have on terrestrial biodiversity. Due to the size of the area, historical imagery was checked at random locations along the proposed powerline corridors (**Figure 3**).

To note, the historical land use type along the proposed powerline routing has been livestock and game farming, with occasional ploughing for crops (**Figure 4** to **Figure 10**). Overgrazing, woody plant encroachment, mining activities and ploughing are all historical disturbances that have occurred in the general area and persist currently. The construction of the existing 132kV powerline appeared to occur between 1991 and 2003, while the 400kV powerline construction occurred between 2007 and 2014.

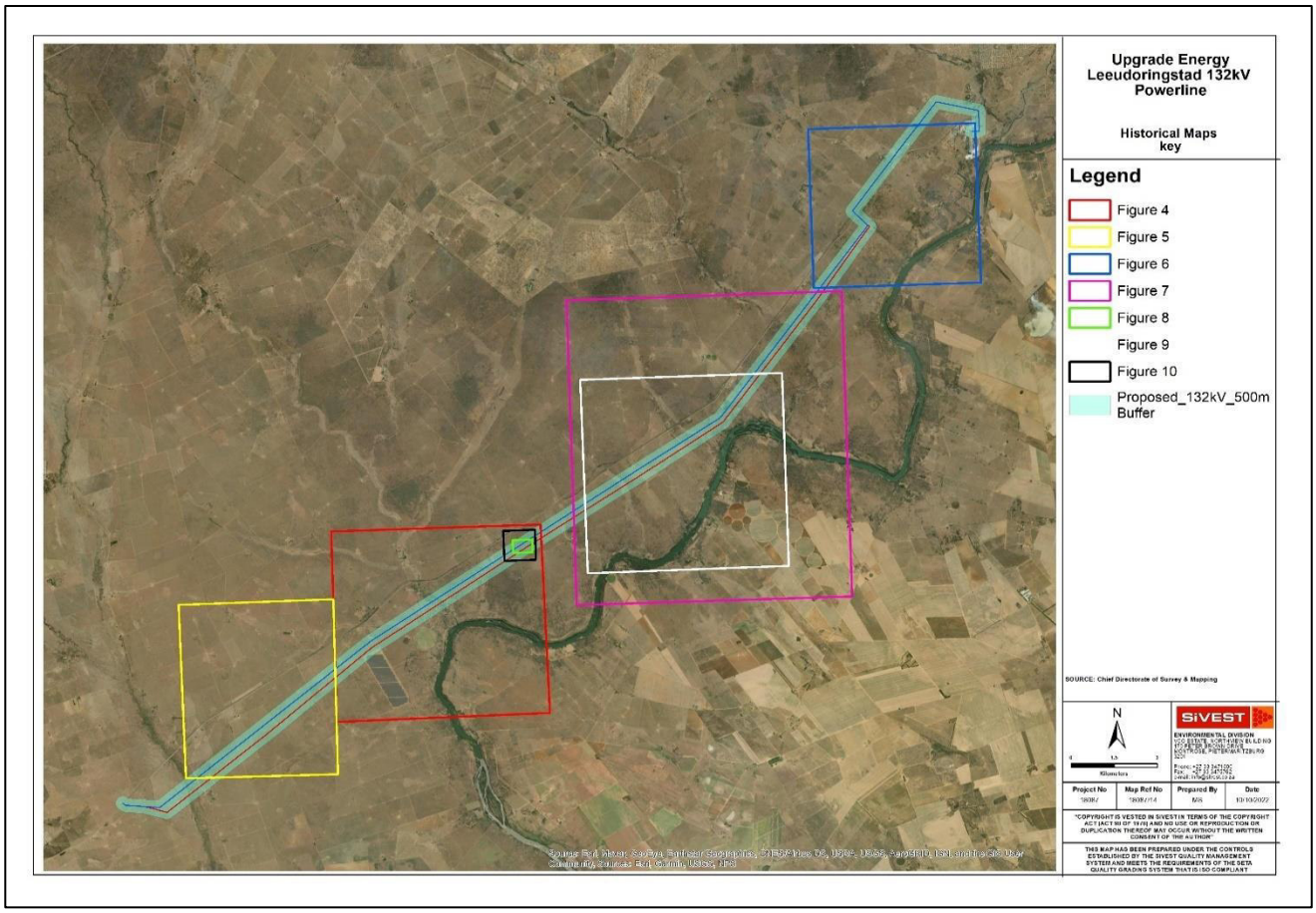

Figure 3: Historical Imagery Locations

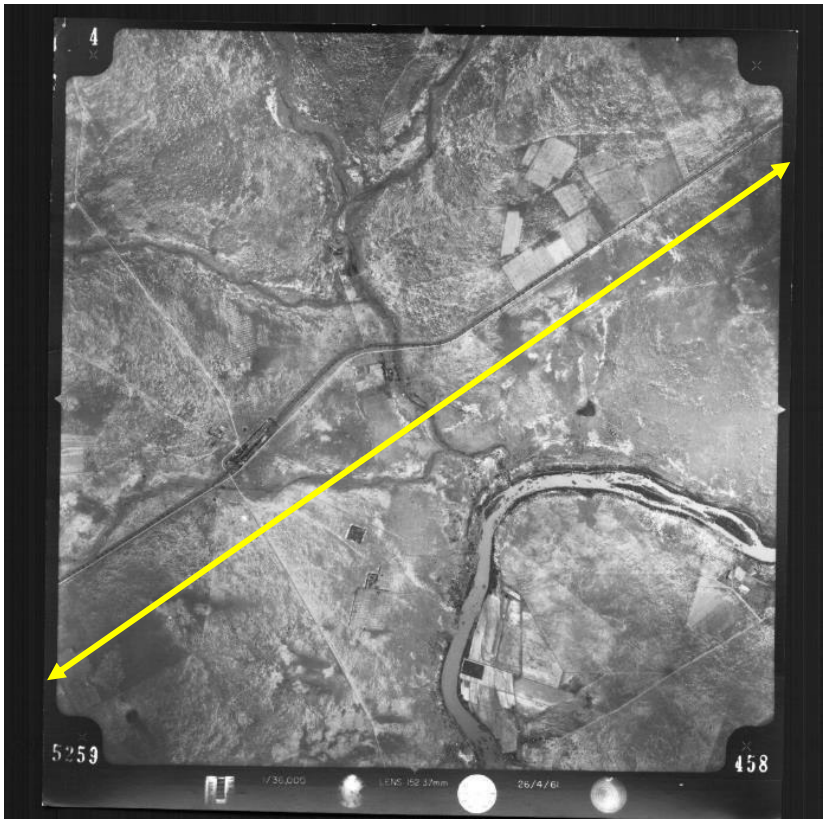

Figure 4: Historical Imagery from 1961.

Figure 5: Historical Imagery from 1970.

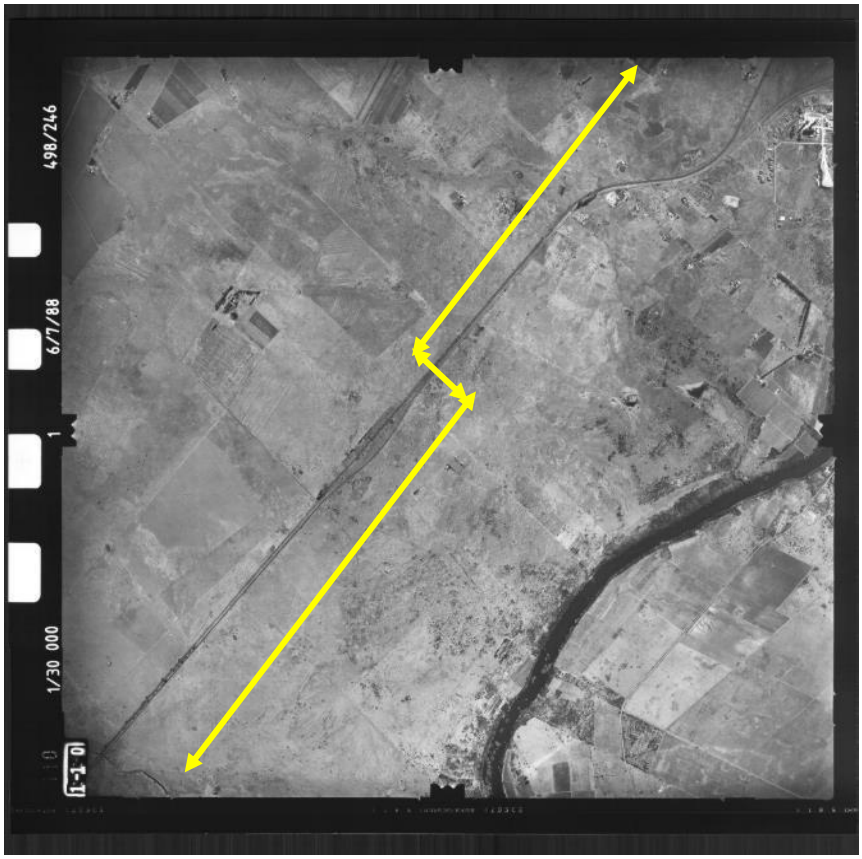

Figure 6: Historical Imagery from 1988.

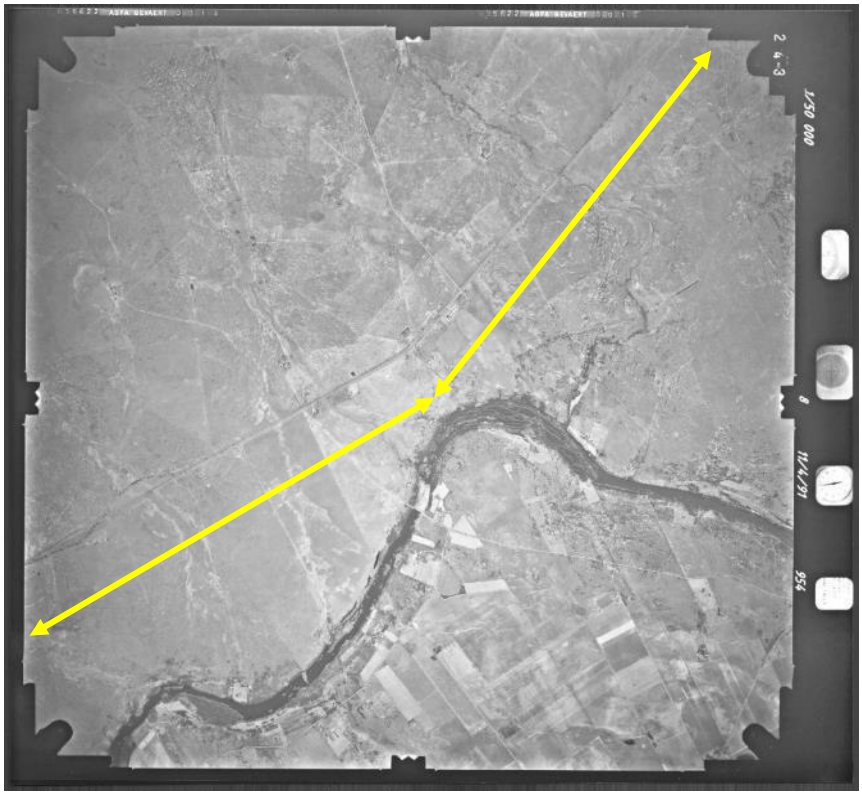

Figure 7: Historical Imagery from 1991.

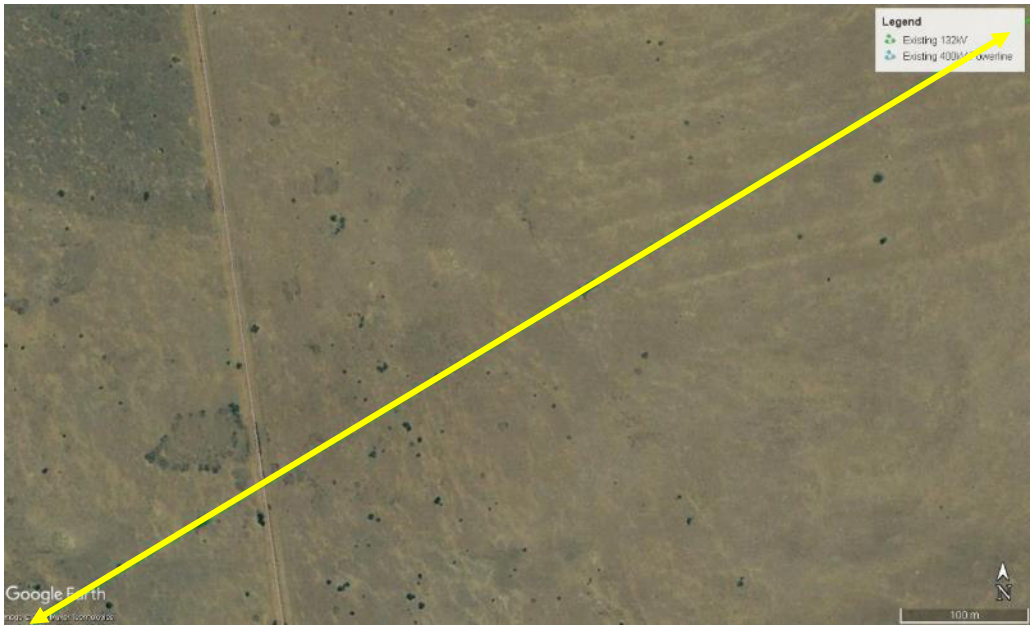

Figure 8: Historical Imagery from 2003.

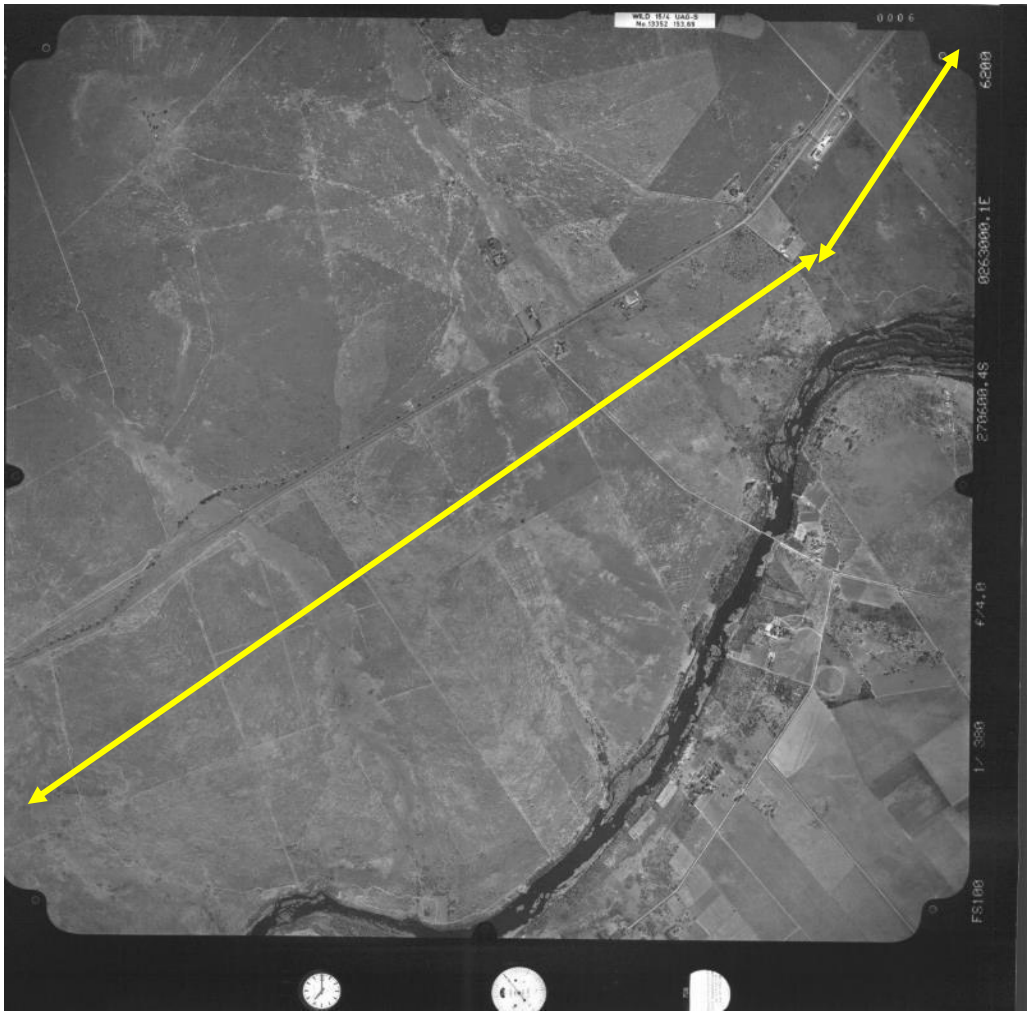

Figure 9: Historical Imagery from 2007.

Figure 10: Historical Imagery from 2014.

7 DESKTOP ASSESSMENT

7.1 Critical Biodiversity Areas / Ecological Support Areas as per NW BSP (2015)

The powerline alternatives traverse CBA 2, ESA 1 and ESA 2 areas (**Figure 11**Error! Reference source not found.). In terms of the NW Biodiversity Sector Plan (2015), the management objectives of each of the CBA categories are as follows:

- CBA 2: Maintain in a natural or near-natural state that maximises the retention of biodiversity pattern and ecological process:
  - Ecosystems and species fully or largely intact and undisturbed.
  - Areas with intermediate irreplaceability or some flexibility in terms of meeting biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising the ability to achieve biodiversity targets, although loss of these sites would require alternative sites to be added to the portfolio of CBAs.
  - These are biodiversity features that are approaching but have not yet passed their limits of acceptable change.

Two patches of CBA 2 are traversed in the northwest portion of the study area and near to the Vaal Reef Ten substation.

- ESA 1: Maintain in at least a semi-natural state as ecologically functional landscapes that retain basic natural attributes:

- Ecosystem still in a natural, near-natural state or semi-natural state, and has not been previously developed.
- Ecosystems moderately to significantly disturbed but still able to maintain basic functionality.
- Individual species or other biodiversity indicators may be severely disturbed or reduced.
- These are areas with low irreplaceability with respect to biodiversity pattern targets only.

The greater part of the powerline servitudes occur within ESA 1 areas.

- ESA 2: Maintain as much ecological functionality as possible (generally these areas have been substantially modified):
  - Maintain current land use or restore area to a natural state.
  - Ecosystem NOT in a natural or near-natural state, and has been previously developed (e.g. ploughed).
  - Ecosystems significantly disturbed but still able to maintain some ecological functionality.
  - Individual species or other biodiversity indicators are severely disturbed or reduced and these are areas that have low irreplaceability with respect to biodiversity pattern targets only.
  - These are areas with low irreplaceability with respect to biodiversity pattern targets only. These areas are required to maintain ecological processes especially landscape connectivity.

A small portion of ESA 2 area is traversed at the southwestern portion of site, where the powerline starts at the Leeudoringstad Solar Facilities.

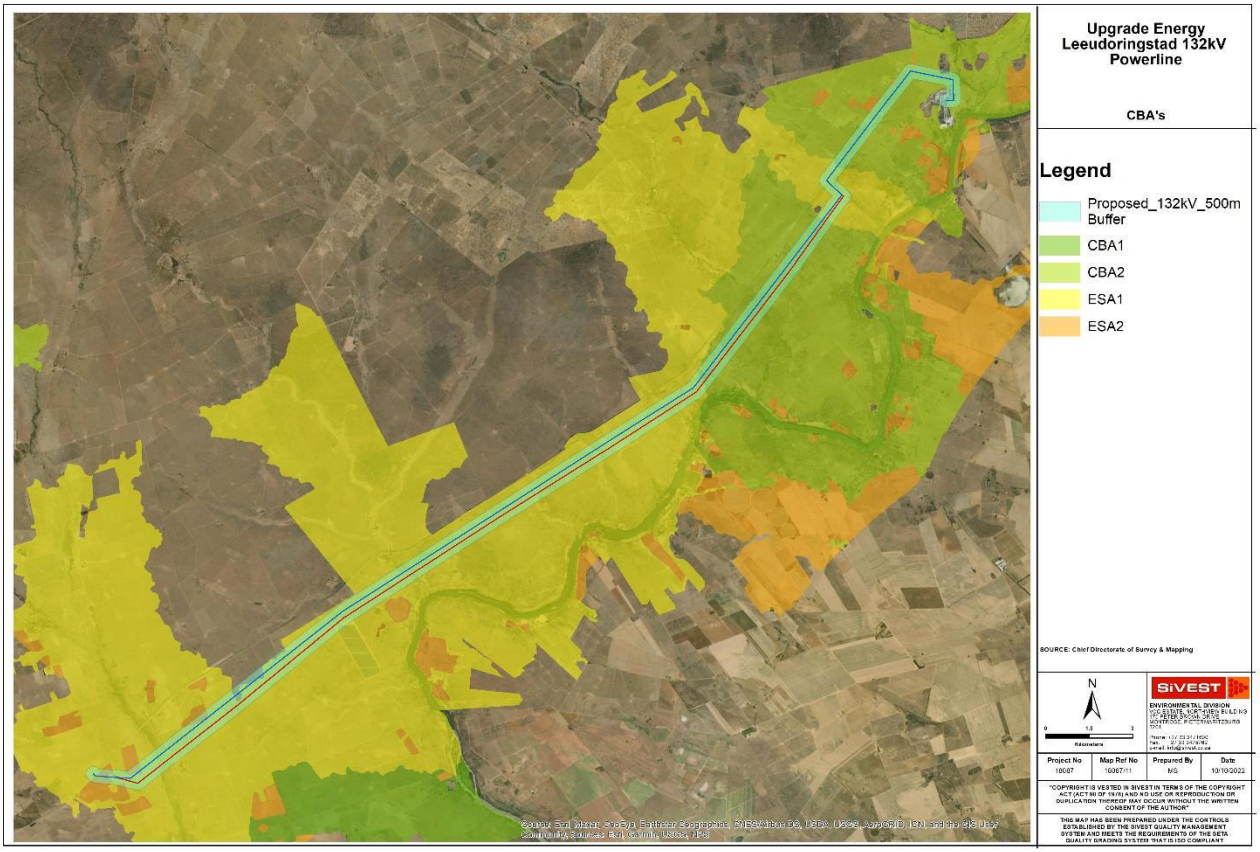

Figure 11: Terrestrial CBA areas.

7.2 SANBI Threatened Ecosystems / NPAES

The entire project area falls within the Endangered Vaal Vet Sandy Grassland, which is identified as a SANBI Threatened Ecosystem (**Figure 12**Error! Reference source not found.) and is noted as an Endangered Ecosystem as per Section 52 of NEM:BA. This vegetation type has also been identified as a Focus Area and an Expansion Priority Area in terms of the SANBI National Protected Areas Expansion System.

Section 52 of NEM:BA has noted that a single species of concern within Vaal Vet Sandy Grassland potentially occurs within the vegetation type, that species being *Lessertia phillipsiana*. This species was last noted in Klerksdorp industrial area in 1918, which is the closest known record to the site.

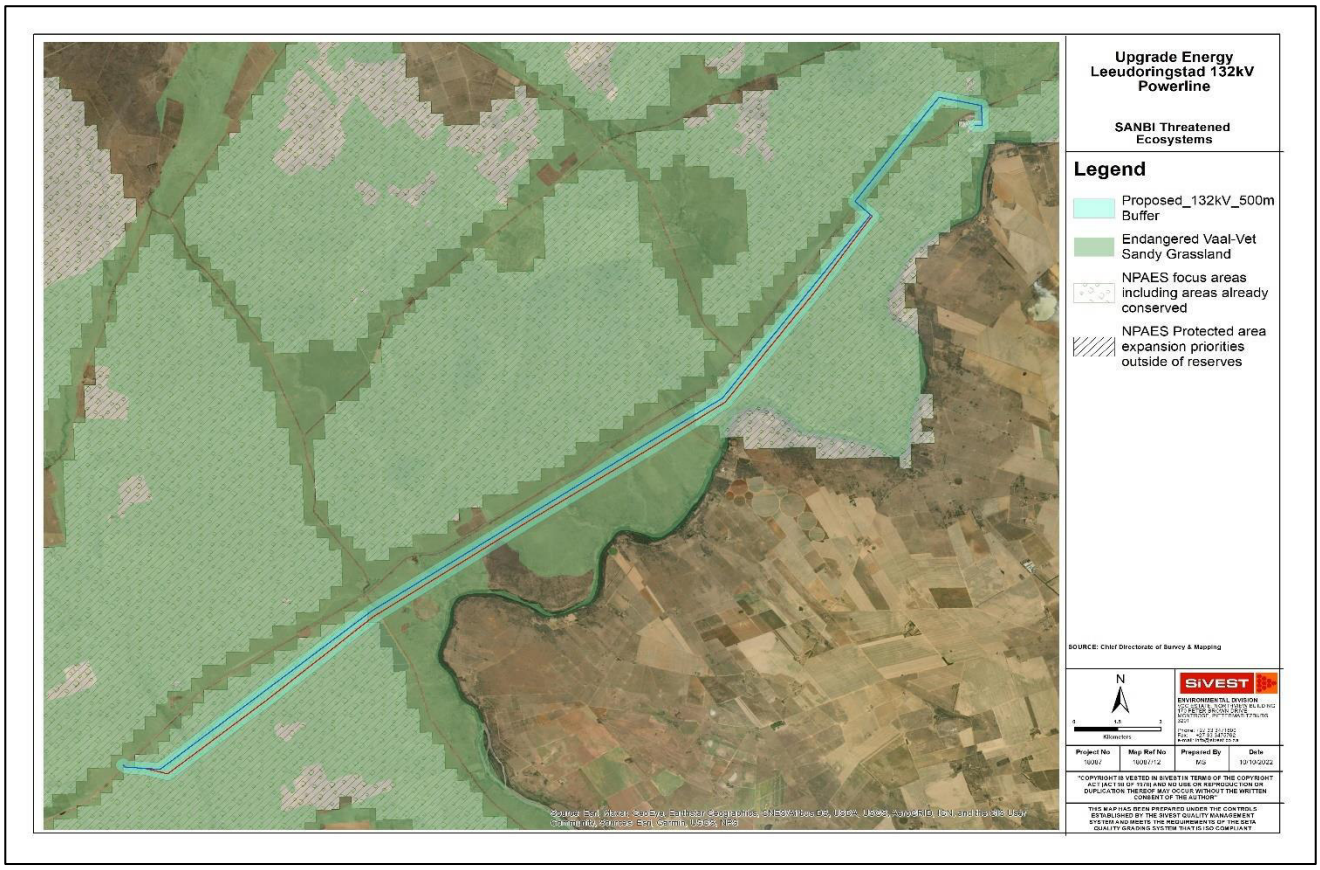

Figure 12: SANBI Databases.

7.3 Protected Areas

No protected areas are traversed by the proposed powerline alternatives (**Figure 13**Error! Reference source not found.). The nearest gazetted protected area is the Boskoppie Game Reserve (Protected Area Code: 555570187) in the Free State Province, which was gazetted in December 1997 by the Department of Environmental Affairs and Tourism. The Boskoppie Game Reserve is approximately 2.3km southeast from the Vaal Reef Ten Substation. The southern portion of the protected area is under pivots, and a mine shaft / infrastructure appears to be present around the centre of the protected area,

therefore the designated protected area shows transformation. This does not affect the proposed powerline alternatives.

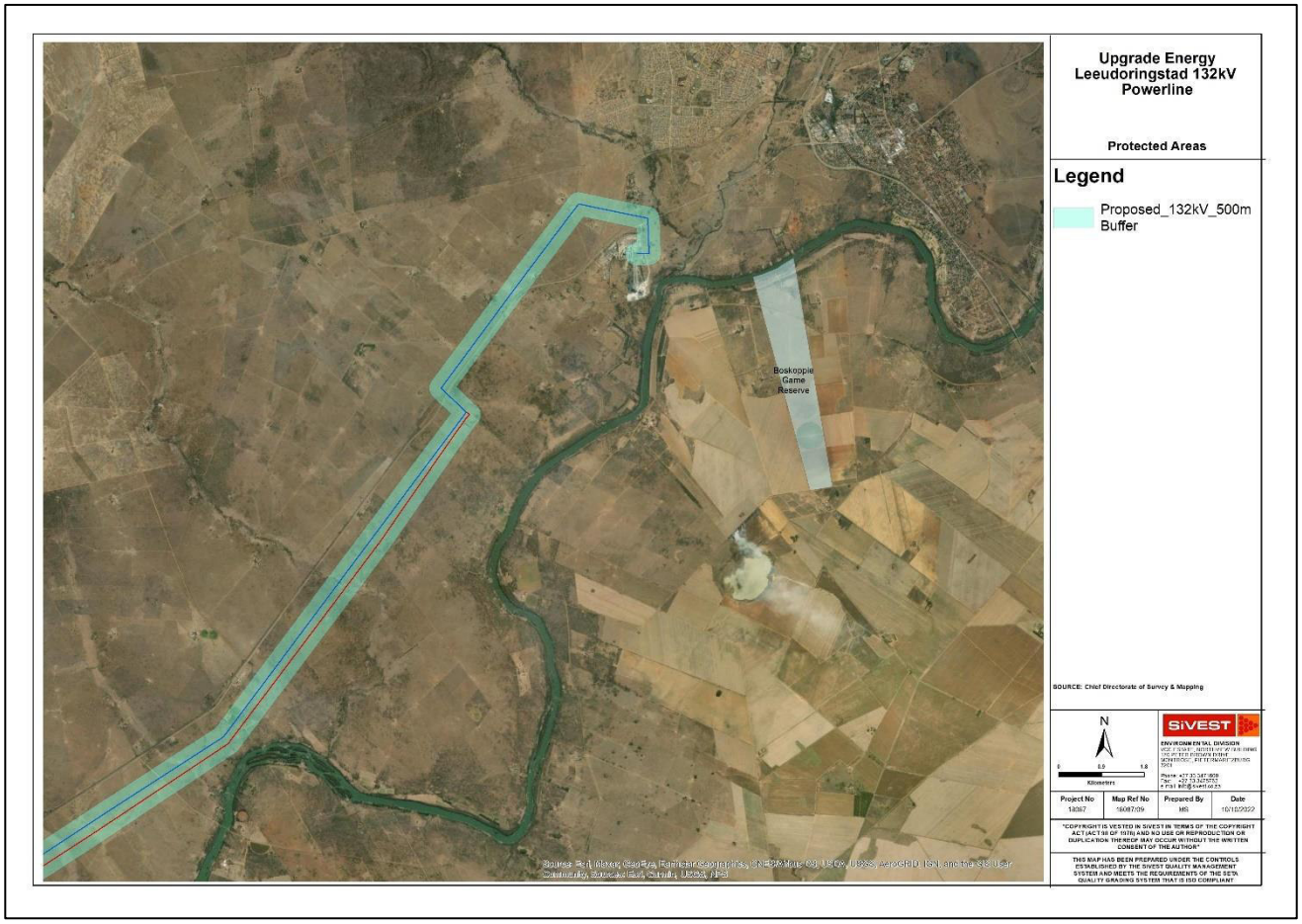

Figure 13: Protected Areas.

7.4 Vegetation Types

The site falls within Vaal Vet Sandy Grassland (GH 10), which is noted as Endangered by SANBI's VegMap (2018, Error! Reference source not found.). Mucina and Rutherford (2006) have classified the vegetation type:

> **Distribution** North-West and Free State Provinces: South of Lichtenburg and Ventersdorp, stretching southwards to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort area north of Bloemfontein. Altitude 1 220–1 560 m, generally 1 260–1 360 m.
> **Vegetation & Landscape Features** Plains-dominated landscape with some scattered, slightly irregular undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element. Dominance of *Themeda triandra* is an important feature of this vegetation unit. Locally low cover of *T. triandra* and the associated increase in *Elionurus muticus*, *Cymbopogon pospischilii* and *Aristida congesta* is attributed to heavy grazing and/or erratic rainfall.
> **Geology & Soils** Aeolian and colluvial sand overlying sandstone, mudstone and shale of the Karoo Supergroup (mostly the Ecca Group) as well as older Ventersdorp Supergroup andesite and basement gneiss in the north. Soil forms are mostly Avalon, Westleigh and Clovelly. Dominant land type Bd, closely followed by Bc, Ae and Ba.

Important Taxa Graminoids: *Anthephora pubescens* (d), *Aristida congesta* (d), *Chloris virgata* (d), *Cymbopogon caesius* (d), *Cynodon dactylon* (d), *Digitaria argyrograpta* (d), *Elionurus muticus* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. plana* (d), *E. trichophora* (d), *Heteropogon contortus* (d), *Panicum gilvum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus berteronianus* (d), *Brachiaria serrata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *E. obtusa*, *E. superba*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*. Herbs: *Stachys spathulata* (d), *Barleria macrostegia*, *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Geigeria aspera* var. *aspera*, *Helichrysum caespititium*, *Hermannia depressa*, *Hibiscus pusillus*, *Monsonia burkeana*, *Rhynchosia adenodes*, *Selago densiflora*, *Vernonia oligocephala*. Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*. Succulent Herb: *Tripteris aghillana* var. *integrifolia*. Low Shrubs: *Felicia muricata* (d), *Pentzia globosa* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *H. paronychioides*, *Ziziphus zeyheriana*.
Endemic Taxon Herb: *Lessertia phillipsiana*.
Conservation Endangered. Target 24%. Only 0.3% statutorily conserved in the Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolwespruit and Soetdoring Nature Reserves. More than 63% transformed for cultivation (ploughed for commercial crops) and the rest under strong grazing pressure from cattle and sheep. Erosion very low (85.3%) and low (11%).

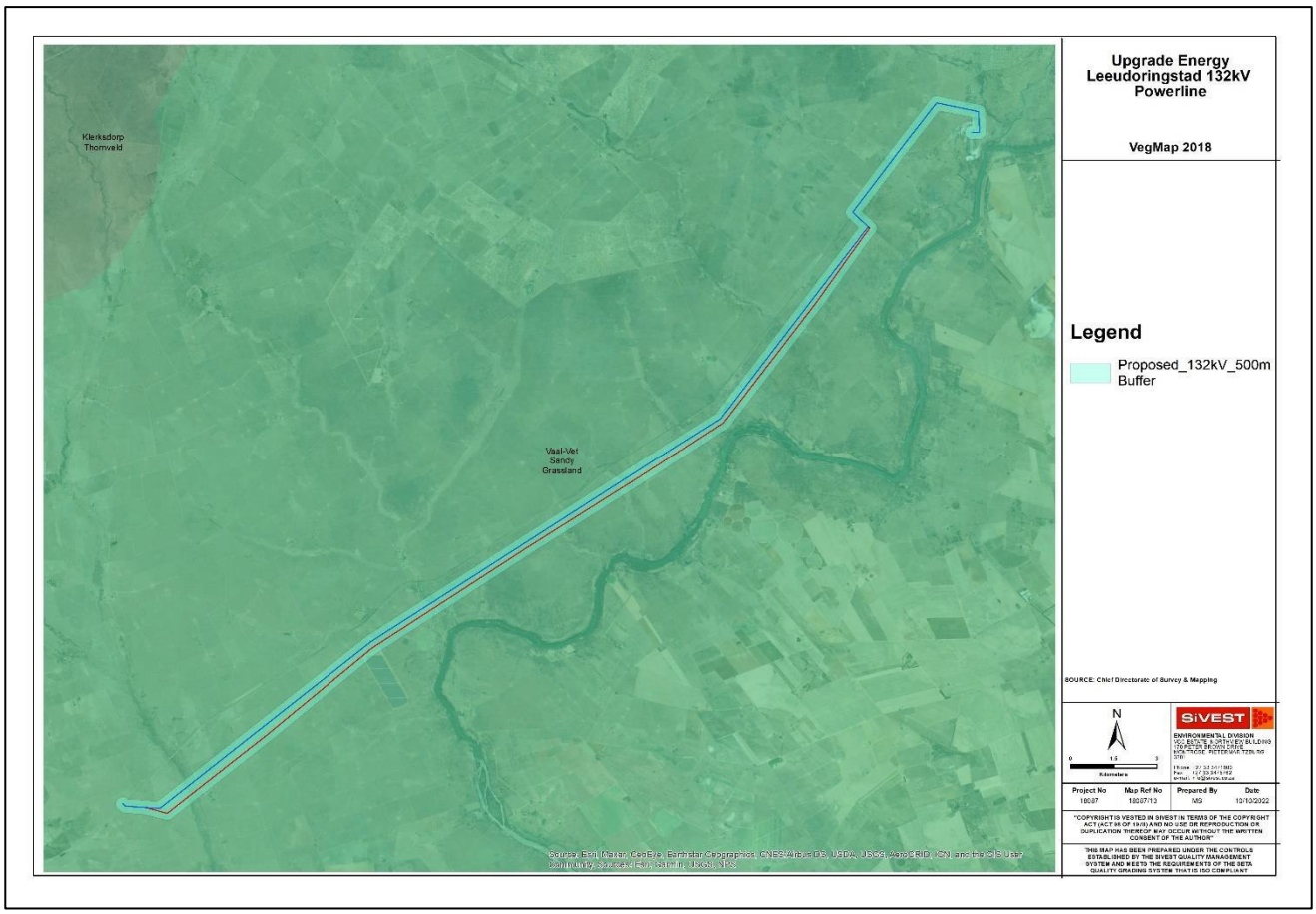

Figure 14: VegMap 2018.

7.5 DFFE Screening Tool

The DFFE Screening Tool Assessment output showed animal species theme to be high, plant species theme to be medium and terrestrial biodiversity sensitivity to be very high (**Table 3** and **Figure 15, Figure 16,** and **Figure 17**).

Table 3: DFFE Screening Tool Sensitivities

Theme	Very High	High	Medium	Low
Animal Species Theme		X		
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

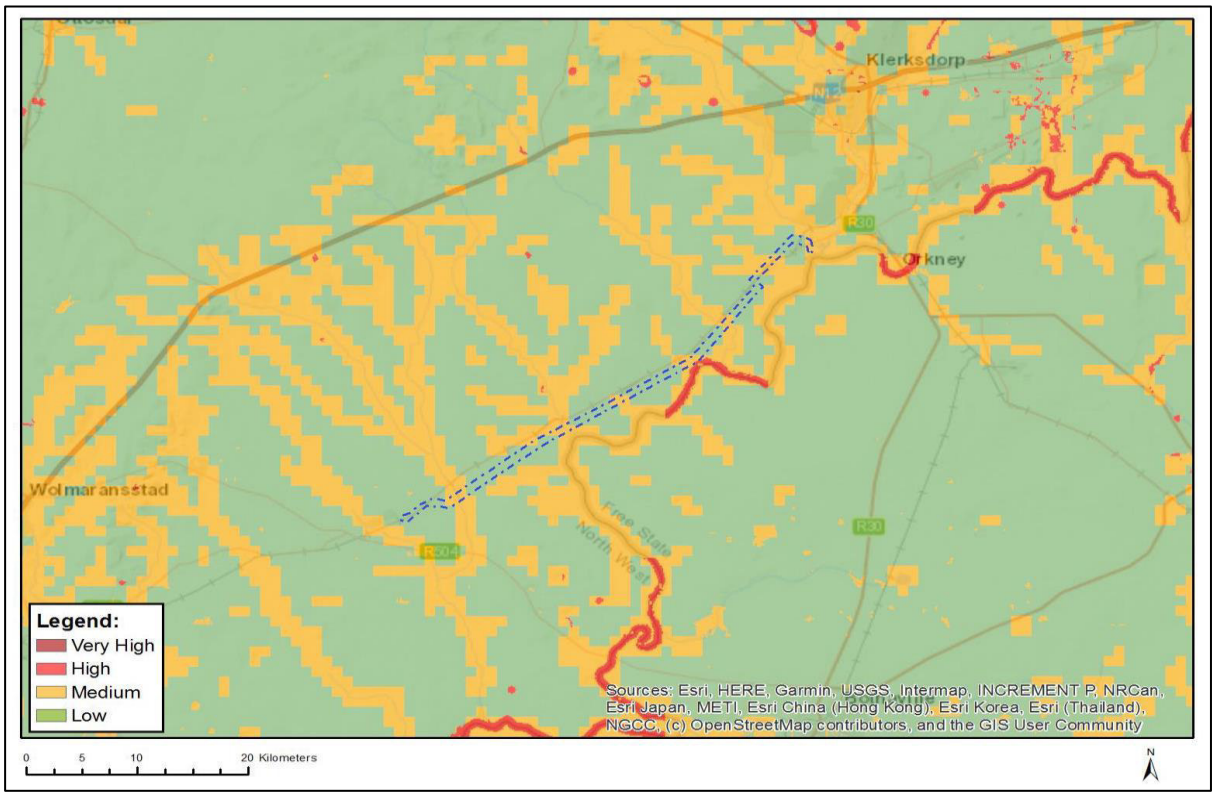

Figure 15: DFFE Animal Theme sensitivity.

Species attributing to the high sensitivities of the animal theme are the Caspian Tern (*Hydroprogne caspia*) and the Spotted Necked Otter (*Hydrictis maculicollis*).

Caspian Terns prefer large inland water bodies, particularly dams and saline pans. None of these habitat types were noted on site however the Vaal River is near the powerlines. No observations of Caspian Terns have been noted on iNaturalist in the area; however, a Caspian Tern was last recorded in 2013 in pentad 2705_2630 on the SABAP 2 Database, most likely flying along the Vaal River.

Please note that avifaunal species are being addressed by an avifaunal assessment, and therefore this taxon will not form part of this report.

The Spotted Necked Otter prefers lakes and larger rivers and has been recorded in the Vaal River between Parys and Christiana. No records have been noted on iNaturalist and no records are in place according to the Virtual Museums MammalMAP.

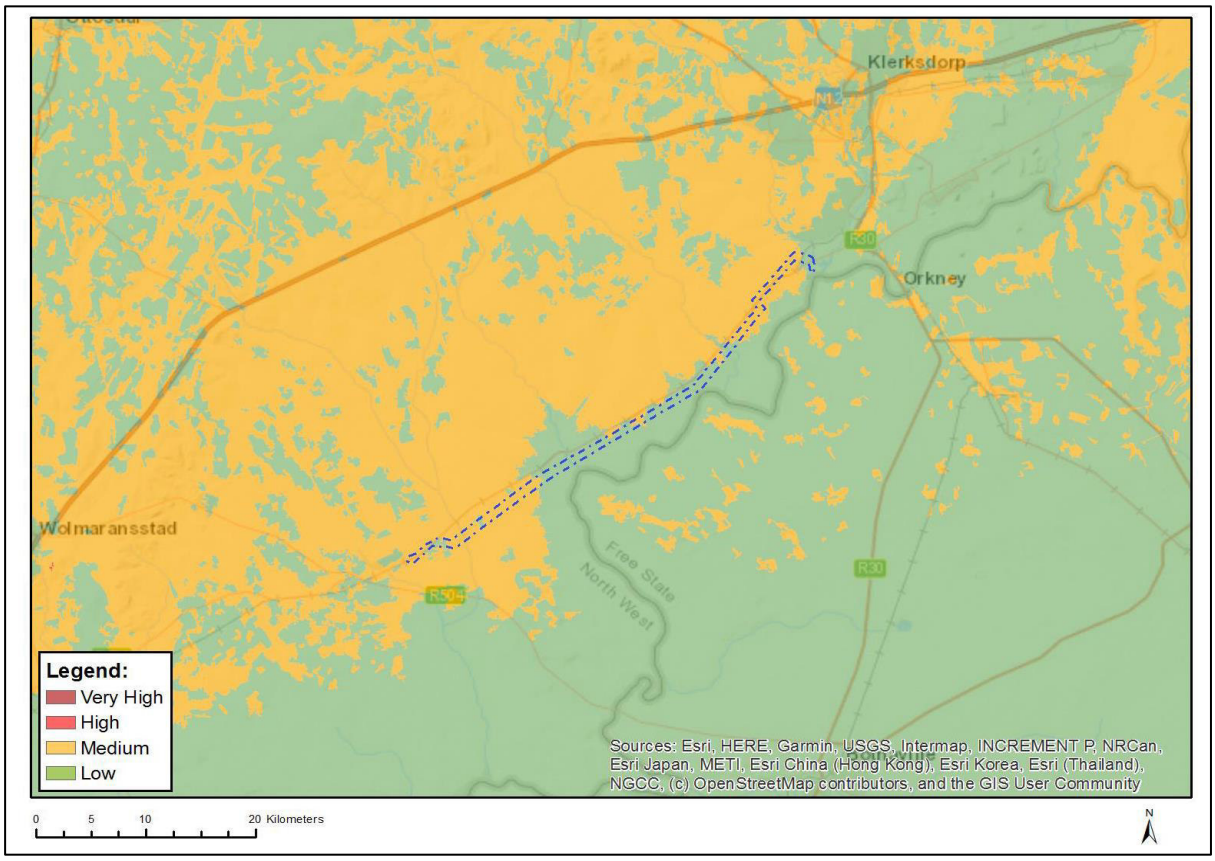

Figure 16: DFFE Plant Theme sensitivity.

The plant species attributing the medium sensitivity to the plant theme is Sensitive Species 1261. The closest record of this species to the proposed powerlines was in Klerksdorp in 1927 (SANBI POSA, 2022). This species is known to occur in fewer than 10 locations from Lichtenburg to Wolmeransstad and Sasolburg (Hahn and von Staden, 2016). Threats to this species are ongoing habitat loss and degradation due to agriculture, overgrazing, urban expansion, and mining.

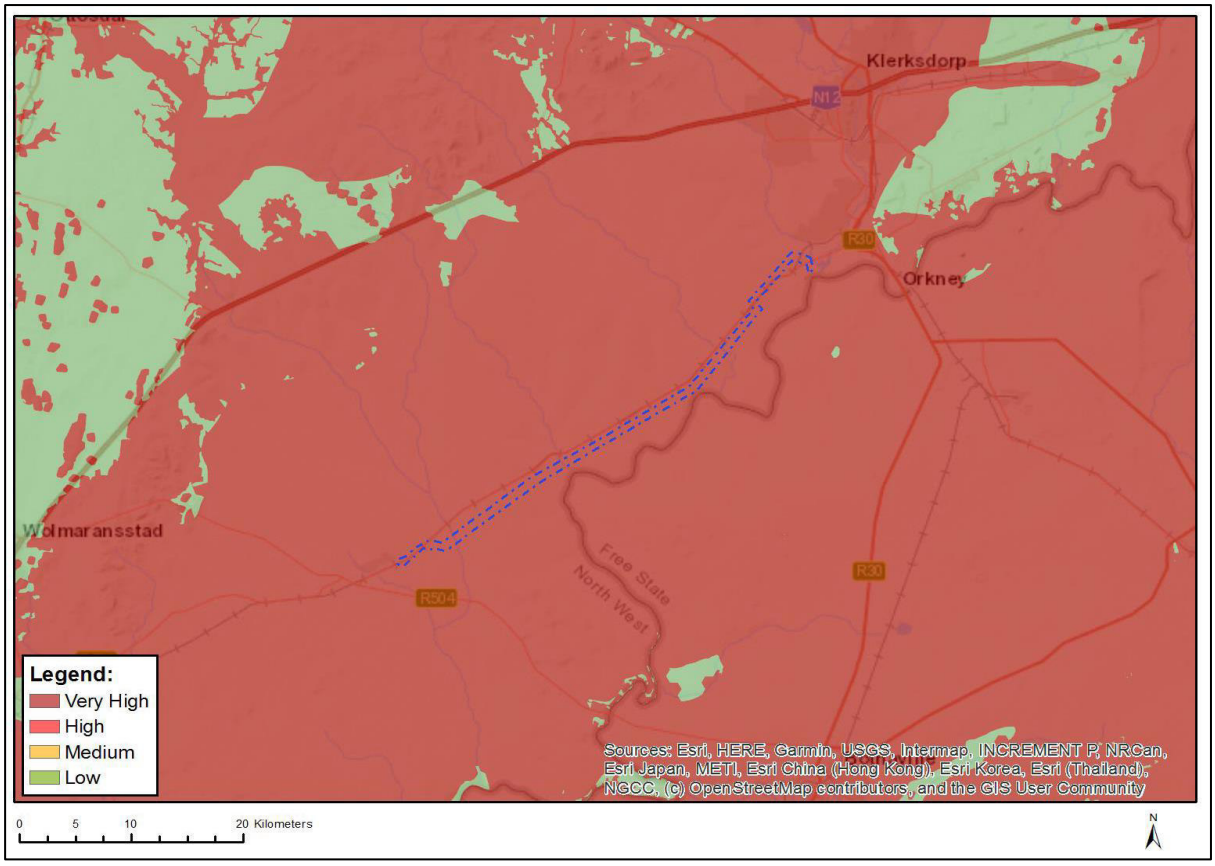

Figure 17: DFFE Terrestrial Biodiversity theme sensitivity.

Features attributed to the very high terrestrial biodiversity sensitivity are the presence of CBA 2, ESA 1, ESA 2, Protected areas Expansion strategy and Endangered Ecosystems (Vaal Vet Sandy Grassland). These sensitivities have been detailed in Section 7.1 to Section 7.4 above.

8 SITE ASSESSMENT AND VERIFICATION

The intention of the site assessment was to assess whether, at a site level, protected plant, animal and threatened ecosystems were present on site. This assessment could not be made without considering the type of development, and the effect of the development on the sensitivities during construction and operation.

Powerlines are linear structures, where physical disturbance of the vegetation and soil occurs at the pylon itself. The pylon dimensions at ground level have not been given, however when on site, the dimension of each leg of the existing 132kV pylon was approximately 0.5m^2, therefore disturbance at each pylon is anticipated to be 2m^2 during construction. Further to note, existing land uses can continue in the presence of powerlines, with minimal loss of vegetation being expected at a local and regional level. This is particularly evident when considering that two powerline types have already been built within the past 20 years and the land use has remained relatively unchanged. With this in mind, the animal, plant and terrestrial biodiversity themes have been assessed at a site level and the overall loss of animal, plant and terrestrial biodiversity features is noted to be low across site for both powerline

alternatives, therefore site sensitivities for all of these themes are low. This will be motivated in the sections below.

8.1 Animal Species Theme

Livestock and game farming has been the predominant landuse in the area for many years. While on site, native faunal species such as Yellow Mongoose (*Cynictis penicillata*), Ground Squirrel (*Geosciurus inauris,* **Plate 1**) and Steenbok (*Raphicerus campestris*) were noted to occur within livestock areas. Although access to game farms was not available, species such as Sable (*Hippotragus niger*), Impala (*Aepyceros melampus*, **Plate 2**), Ostrich (*Struthio camelus,* **Plate 3**) and Nyala (*Tragelaphus angasii,* **Plate 4**) form part of the game farmers breeding programmes (Sable usually avoid grassy plains and Nyala naturally occur in the eastern and northern parts of South Africa, meaning these species are out of their natural home range). Species noted in the assessment were seen while surveying sections of Alternative 1 and Alternative 2 powerlines, which are proposed to run adjacent to the existing powerlines. This means that the presence of these species prevails within existing powerline infrastructure. Therefore, the construction of a new powerline is not anticipated to have a negative effect on the faunal species, as construction activities are limited to installing the pylon, and stringing the lines, which are activities that will have minimal effect on animal species during construction, and no effect on faunal species during operation.

In terms of the DFFE sensitive species (Spotted Necked Otter), no major river systems or dams are being traversed by the powerline. The associated pylons of the existing 132kV and 400kV powerlines have been placed outside of wetlands, pans and rivers (i.e. spanned over sensitive aquatic ecosystems). This species is therefore unlikely to be affected by the proposed powerlines.

Considering that the landuse is likely to remain the same after construction and throughout operation, the proposed project is considered to have a low overall impact on faunal species, particularly species noted as sensitive (according to the DFFE screening tool). Therefore, the designation of High Animal Sensitivity is disputed and is revised to Low, meaning that a full faunal assessment is not required, and a Confirming statement will be issued.

 **Plate 1: Ground Squirrel in the project area.**	 **Plate 2: Impala as part of a game breeding programme within the existing powerline servitude.**

Plate 3: Common Ostrich within the powerline servitude.

Plate 4: Nyala as part of a game breeding programme.

8.2 Plant Species Theme

The species attributing the medium sensitivity to the plant theme is Sensitive Species 1261. The closest record of this species to the proposed powerlines was in Klerksdorp in 1927 (SANBI POSA, 2022). This species is known to occur in fewer than 10 locations from Lichtenburg to Wolmeransstad and Sasolburg (Hahn and von Staden, 2016). Threats to this species are ongoing habitat loss and degradation due to agriculture, overgrazing, urban expansion and mining. It is highly unlikely that this species is going to be negatively affected by the proposed project, due to the limited known locations and rarity of the species, therefore the Medium Sensitivity attributed to the Plant Theme is revised to Low, meaning that a full vegetation assessment is not required, and a Confirming statement will be issued.

Common grass species noted on site were *Themedia triandra, Eragrostis superba, Eragrostis chloromelas, Enneapogon scoparuis, Cymbopogon pospischilii* and *Eragrostis gummiflua*. Common herbs, forbs and bulbs noted on site include but are not limited to *Bulbine capitata* (**Plate 5**), *Bulbine narcissifolia* (**Plate 6**), *Ledebouria spp* (**Plate 7**) and *Hypoxis hemerocallidea.* Further species include Vachellia karoo, Erythrina zeyheri (**Plate 8**) and Ximenia americana (**Plate 9**).

Plate 5: *Bulbine capitata*

Plate 6: *Bulbine narcissifolia*

 **Plate 7: *Ledebouria spp.***	 **Plate 8: *Erythrina zeyheri***
 **Plate 9: *Ximenia americana***	

8.3 Terrestrial Biodiversity Theme

The SANBI and NW Biodiversity Sector Plans designations of the study area are related to the presence of Vaal Vet Sandy Grassland, therefore this habitat type, and ecosystem corridors were assessed for the Very High Terrestrial Biodiversity Theme.

Vegetation types along the proposed powerline routings is dominated by grasslands and interspersed with woody vegetation, particularly in areas where overgrazing is present. Some plant species indicative of the Vaal Vet Sandy Grassland are present throughout the area and although this vegetation type may be present, it is in a secondary state (i.e. overgrazed or disturbed and not in its climax state). Secondary Vaal Vet Sandy Grassland is present from the Leeudoringstad Solar Facilities towards the centre of the powerline alternatives. There is local dominance of *Themeda triandra, Elionurus muticus, Cymbopogon pospischilii* and *Aristida congesta*, suggesting heaving grazing (Mucina and Rutherford, 2006). Woody plant encroachment into secondary Vaal Vet Sandy Grassland in the form of Sweet Thorn (*Vachellia karoo*) is present where overgrazing occurs, particularly from the centre of site heading towards the Vaal Reef Ten substation.

Historical imagery shows that ploughing / mining activities have occurred in the past in the general area, however vegetation has rehabilitated to a semi-natural state, particularly where lower density livestock farming has occurred.

Features attributed to the very high terrestrial biodiversity sensitivity are the presence of CBA 2, ESA 1, ESA 2, Protected Areas Expansion Strategy, and Endangered Ecosystems (Vaal Vet Sandy Grassland).

SANBI Threatened Ecosystems, Protected Areas Expansion Strategy and Endangered Ecosystems:
SANBI's databases related to Vaal Vet Sandy Grassland triggering the DFFE Screening Tool were verified to occur on site, meaning that a Very High Sensitivity Threatened Ecosystem was present, although in a secondary state and with woody plant encroachment occurring (**Plate 10** and **Plate 11**). While this is an Endangered Ecosystem, 132kV and 400kV powerlines have been constructed in the past 20 years and it was evident from the site inspection that disturbance usually occurred at the pylon site itself, and successful rehabilitation around the pylon was achieved (**Plate 12** to **Plate 15**). Existing land use was also retained while the powerlines have been in operation. Land use practices, and the threat of overgrazing is seen as a bigger threat to Vaal Vet Sandy Grassland than the construction and operation of the powerlines.

Considering the above, although the presence of Very High Sensitivity and Endangered Ecosystem types are present on site, the continuation of existing land use practices around existing pylons and the minimal disturbance during construction, coupled with lack of disturbance during operation of pylons motivates for the site sensitivity to be reduced to Low, therefore a full Terrestrial Biodiversity Assessment is not required.

CBA 2, ESA 1 and ESA 2 areas:
The triggering of these databases is focused on minimising development and protection of Vaal Vet Sandy Grassland and providing for ecological support and corridor areas for this vegetation type. The physical disturbance during construction of this vegetation type is at a minimum and the surrounding land use is unlikely to change during operation (as explained in paragraphs above), the risk of disturbance to CBA2, ESA 1 and ESA 2 areas is considered Low, and a full Terrestrial Biodiversity Assessment is not required.

Plate 10: Woody plant encroachment into GH 10.

Plate 11: Woody plant encroachment into GH 10.

Plate 12: Persistence of Grassland in existing pylon areas.

Plate 13: Persistence of Grassland in existing pylon areas.

Plate 14: Persistence of Grassland in existing pylon areas.

Plate 15: Persistence of Grassland in existing pylon areas.

9 IMPACT ASSESSMENT AND IMPACT STATEMENT

The nature the construction of a powerline is that it has the potential to cause negative environmental effects. However, if mitigation measures for the activity are correctly implemented and the rehabilitation is successful, minimal disturbance of environment will be seen.

Potential issues relevant to impacts on the Terrestrial Biodiversity of the study area include the following:

- Impacts on fauna and flora: this includes any impacts on populations of individual species of flora and fauna, including protected species within the habitats noted on site.
- Impacts on sensitive habitats: this includes impacts on any sensitive or protected habitats, including indigenous grassland and wetland vegetation that leads to direct or indirect loss of such habitat. The potential impacts of the proposed development mainly related to loss of Vaal Vet Sandy Grassland, CBA 2, ESA1 and ESA 2 and protected plants associated with these sensitive ecosystems.
- Impacts on ecosystem function: this includes impacts on any processes or factors that maintain ecosystem functionality at a local and regional scale:

- Habitat fragmentation;
- Changes to abiotic environmental conditions;
- Changes to disturbance regimes, e.g., increased grazing / overgrazing;
- Changes to vegetation components (e.g. shifting from primary to secondary state of grasslands);
- Increased invasion by alien plants.

Changes to factors such as these may lead to a reduction in the resilience of plant communities and shifts in ecosystem function and type.

Both powerline alternatives within the 500m assessment corridor align parallel to an existing disturbance corridor associated with the 132kV and 400kV powerlines. Neither of the proposed powerline options within the 500m corridor are more sensitive than the other in terms of effect on terrestrial biodiversity, therefore impacts have been assessed for a powerline in general (i.e. Alternative 1 and Alternative 2 have not been assessed separately).

9.1 Planning And Design Phase Impacts

Placement of pylons and road access within sensitive aquatic systems such as pans, wetlands, drainage lines and non-perennial streams. This will increase the likelihood of affecting protected plants and sensitive ecosystems.

Please note that impacts related to avifauna and wetlands have not been assessed as these two fields have been covered by their relevant specialists. However, recommendations relating to wetlands are included in Table 4 below.

9.2 Construction Phase Impacts

9.2.1 Indigenous Natural Vegetation

Loss, degradation or fragmentation of vegetation through direct clearing at pylons and associated servitudes. Removal or destruction of plant species of conservation concern / protected species through direct clearing at pylon sites.

9.2.2 Habitat Transformation and Fragmentation for Fauna

Continued transformation of vegetation in the area could result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface may lead to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity for species dependant on certain habitat types.

9.2.3 Loss Of Threatened and Protected Ecosystems

The presence of Endangered Vaal Vet Sandy Grassland, CBA 2, ESA 1 and ESA 2 areas within the proposed project could result in a threat or loss of these ecosystem features.

9.3 Operation Phase Impacts

9.3.1 Loss of Indigenous Vegetation

Establishment and spread of alien invasive plant species due disturbance vectors.

9.3.2 Loss of Fauna to Operational Phase

Direct mortality of fauna through traffic, illegal collecting, poaching and collisions and/or entanglement with powerlines;

9.3.3 Loss of Threatened and Protected Ecosystems

Maintenance of powerlines will be required, particularly where the trimming of large trees, and the clearing of woody plant encroachment around pylons. Maintenance within the protected and sensitive ecosystems could result in edge effects, and establishment of alien and invasive species.

9.4 Decommission Phase Impacts

Decommissioning phase impacts are anticipated to be the same as the construction and operation phase impacts, therefore mitigation measures for the construction and operation phase must be followed should decommissioning of the powerlines occur.

9.5 No-Go Alternative.

The No-Go option would be the status quo. This would mean that no new disturbance of threatened or protected ecosystems, protected plants and protected animals would occur, and the current land use would continue as is. Power from the already approved Leeudoringstad SPV facilities would not be supplied into South Africa's electricity grid.

9.6 Cumulative Impacts

Cumulative impacts occur where existing or planned developments, in conjunction with the proposed developments, result in significant incremental changes in the broader study area. In this instance, such developments would include renewable energy facilities and associated infrastructure development.

There are nine proposed solar and wind energy facilities approved within 35km of site. Each of the sites will require electrical distribution in order to deliver their generation capacity to the grid. At the time of writing the size of the facilities and the associated distribution is unknown. However the proposed project is noted to occur within a Strategic Transmission Corridor.

9.7 Overall Impact Rating

The overall negative impact of the proposed project is considered low. A relatively limited area will be lost to development, and existing land uses underneath the powerlines remains the same. This will result in the loss of some indigenous plants at pylon site level, but little anticipated impact on any plant or animal species of conservation concern or threatened ecosystems. Further to note is that the existing

132kV and 400kV powerlines have shown successful rehabilitation and re-establishment of native plant species.

Table 4: Rating of impacts associated with the proposed development

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	+ /-	S		E	P	R	L	D	I / M	TOTAL	+/-	S
Planning and Design Phase																				
Placement of infrastructure	Placement of pylons and road access within sensitive aquatic systems such as pans, wetlands, drainage lines and non-perennial streams. This will increase the likelihood of affecting protected plants and sensitive terrestrial ecosystems.	2	3	1	3	3	3	36	-	Med	▪ Pylons must be placed outside of pans, wetlands, drainage lines and rivers (i.e. spanned across wet areas to avoid ground level impact). ▪ Pylon should be placed adjacent to existing pylons. ▪ Roads for site access must be limited to existing roads.	2	1	1	1	2	2	14	-	Low
Construction Phase																				
Indigenous natural vegetation	Loss, degradation or fragmentation of vegetation through direct clearing at pylons and associated servitudes. Removal or destruction of plant species of conservation concern / protected species through direct clearing at pylon sites.	2	3	1	3	3	3	36	-	Med	▪ Pylons must be placed outside of pans, wetlands, drainage lines and rivers. ▪ Pylons should be placed adjacent to existing pylons (i.e. spanned across wet areas to avoid ground level impact). ▪ Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna.	1	2	1	2	2	2	16	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	+ /-	S		E	P	R	L	D	I / M	TOTAL	+/-	S
Habitat transformation and fragmentation for fauna	Continued transformation of vegetation in the area could result in a marginal reduction in flora and fauna for the area. Disturbance of the soil surface may lead to the establishment of alien invasive plant species. Continued transformation of the land results in habitat fragmentation, where edge effects decrease suitable habitat for a wide range of fauna in the area. This leads to an overall indirect decline in faunal diversity for species dependant on certain habitat types.	2	3	1	3	3	3	36	-	Med	▪ Pylons must be placed outside of pans, wetlands, drainage lines and rivers (i.e. spanned). ▪ Pylons should be placed adjacent to existing pylons. ▪ Existing access roads must be used as far as possible. ▪ Placement of bird flappers to deter avifauna from colliding with powerlines, particularly in the vicinity of pans and watercourses. ▪ All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. ▪ Implement traffic control measures, including speed limits and no-go zones.	1	2	1	2	2	2	16	-	Low
Loss of threatened and protected ecosystems	The presence of Endangered Vaal Vet Sandy Grassland, CBA 2, ESA 1 and ESA 2 areas within the proposed project could result in a threat or loss of these ecosystem features.	3	3	2	3	3	3	42	-	Med	▪ Pylons must be placed outside of pans, wetlands, drainage lines and rivers. ▪ Pylons should be placed adjacent to existing pylons (i.e. spanned across wet areas to avoid ground level impact). ▪ Existing access roads must be used as far as possible. ▪ Clearance should be limited to the location of each pylon only. ▪ Clearance for construction should be done in a phased approach, and	2	2	1	2	1	2	16	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	+ /-	S		E	P	R	L	D	I / M	TOTAL	+/-	S
											rehabilitation should be done as soon as work has ceased along the section of routing. ▪ Areas outside of the construction zone must be demarcated as "no-go" areas. ▪ Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. ▪ An alien and invasive control programme should be implemented, particularly in areas where soil disturbance has occurred. ▪ Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.									
Operational Phase																				
Loss of indigenous vegetation	Establishment and spread of alien invasive plant species due disturbance vectors.	2	3	1	2	2	2	18	-	Low	▪ An alien and invasive control programme should be implemented, particularly in areas where soil disturbance will occur during operational and maintenance. ▪ Compile a rehabilitation programme and rehabilitate areas disturbed during operational maintenance activities. ▪ Undertake regular monitoring to detect alien and invasive plant establishment	2	1	1	1	2	2	14	-	Low

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	+ /-	S		E	P	R	L	D	I / M	TOTAL	+/-	S
											and erosion of soil surface so that they can be controlled.									
Loss of fauna due to operational phase	Direct mortality of fauna through traffic, illegal collecting, poaching and collisions and/or entanglement with powerlines;	2	3	1	2	2	2	18	-	Low	▪ Compile a rehabilitation programme and rehabilitate areas disturbed during operational maintenance activities. ▪ Undertake powerline collision surveys to assess whether bird flappers are successful in deterring avifauna from collisions.	2	1	1	1	2	2	14	-	Low
Loss of threatened and protected ecosystems	Maintenance of powerlines will be required, particularly where the trimming of large trees, and the clearing of woody plant encroachment around pylons. Maintenance within the protected and sensitive ecosystems could result in edge effects, and establishment of alien and invasive species. Land use is unlikely to change from its current use.	2	3	1	2	2	2	18	-	Low	▪ An alien and invasive control programme should be implemented, particularly in areas where soil disturbance will occur during operational and maintenance. ▪ Compile a rehabilitation programme and rehabilitate areas disturbed during operational maintenance activities. ▪ Monitor whether land use and retention of Vaal Vet Sandy Grassland remains the same during operational phase and see whether land uses is affected by the powerlines	2	1	1	1	2	2	14	-	Low
Decommissioning Phase																				

ENVIRONMENTAL PARAMETER	ISSUE / IMPACT / ENVIRONMENTAL EFFECT/ NATURE	ENVIRONMENTAL SIGNIFICANCE BEFORE MITIGATION									RECOMMENDED MITIGATION MEASURES	ENVIRONMENTAL SIGNIFICANCE AFTER MITIGATION								
		E	P	R	L	D	I / M	TOTAL	+ /-	S		E	P	R	L	D	I / M	TOTAL	+/-	S
It is anticipated that decommissioning phase impacts will mirror the construction and operation phase impacts. As such, construction and operation phase impacts must be implemented should the powerline be decommissioned.																				
No-Go Alternative																				
Terrestrial Ecological loss	Plants, animals and Endangered Vaal Vet Sandy Grassland would not get disturbed by the construction of a powerline and pylons. This would result in the land use remaining as it currently is.	2	4	1	1	1	1	9	+	Low	N/A									

9.8 Conditions to be included in Generic EGI EMPr

Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Pylons must be placed outside of pans, wetlands, drainage lines and rivers. – Pylons should be placed adjacent to existing pylons (i.e. spanned across wet areas to avoid ground level impact). – Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna.	**Contractor and Applicant**	**Specialist recommendations; Method statement; Search and Rescue Plan; Alien Vegetation Removal Plan (approved plans and strategies used by Eskom(; site awareness**	**Pre-Construction and Construction and Operation**	**ECO**	**Pre-Construction and weekly during construction**	**Compliance to method statements and Search and Rescue Plan; Alien Vegetation Removal Plan (approved plans and strategies used by Eskom)**

Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Pylons must be placed outside of pans, wetlands, drainage lines and rivers (i.e. spanned). – Pylons should be placed adjacent to existing pylons.	**Contractor**	**Method statement and adherence to exclusion/no-go zones; site awareness**	**Construction**	**ECO**	**Weekly**	**Public complaints register; adherence to exclusion/no-go zones and method statements**

– Existing access roads must be used as far as possible. – Placement of bird flappers to deter avifauna from colliding with powerlines, particularly in the vicinity of pans and watercourses. – All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person. – Implement traffic control measures, including speed limits and no-go zones.						

Protection of threatened ecosystems

Impact management outcome: Minimise disturbance protected Vaal Vet Sandy Grasslands						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Pylons must be placed outside of pans, wetlands, drainage lines and rivers. – Pylons should be placed adjacent to existing pylons (i.e. spanned across wet areas to avoid ground level impact). – Existing access roads must be used as far as possible. – Clearance should be limited to the location of each pylon only. – Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing. – Areas outside of the construction zone must be demarcated as “no-go” areas.	**Contractor**	**Method statement and adherence to exclusion/no-go zones; site awareness, Search and Rescue Plan; Alien Vegetation Removal Plan (approved plans and strategies used by Eskom(; site awareness**	**Construction**	**ECO**	**Weekly**	**Public complaints register; adherence to exclusion/no-go zones and method statements**

– Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas. – An alien and invasive control programme should be implemented, particularly in areas where soil disturbance has occurred. – Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.						

9.9 Comparative Assessment of Alternatives

Within the 500m assessment corridor, two powerline alternatives were assessed. An assessment of alternatives is required to determine the preferred alternative. Both alternatives occur within the same vegetation types and micro habitats, therefore species composition and diversity is anticipated to be identical. Therefore, the selection of the preferred alternative is based on proximity to existing infrastructure and disturbances.

Table 4: Comparative assessment of powerline alternatives.

Alternative	Preference	Reasons
POWERLINE ALTERNATIVES		
Powerline Alternative 1	Preferred	This powerline is located closer to the main regional road, the R502 and will sit parallel to the existing 132kV powerline, so it will be of similar dimensions. This powerline is also further away from the Vaal River, which will reduce potential impacts from avifauna.
Powerline Alternative 2	Least preferred	This powerline is located further away from the R502 and is closer to the Vaal River. The dimensions of the 400kV powerline are also different to the proposed 132kV. Risk of avifauna collision is therefore increased.

10 IMPACT STATEMENT

Risk of losing Endangered Vaal Vet Sandy Grassland, and the associated CBA 2, ESA 1 and ESA 2 areas, with the construction of a 132kV powerline is noted to be Low provided that the mitigation measures are implemented. Existing 132kV and 400kV powerlines within the assessment corridor, show that rehabilitation around the pylons is possible and allows for the existing land use (livestock grazing and game farming) to continue. This does not affect threatened ecosystems listed by the SANBI and therefore the risk of losing the threatened ecosystem to the construction of the powerline is Low. Potential for plant Species of Conservation Concern is present but a site walkdown of the pylon locations prior to construction is suggested, in order to confirm or otherwise the need for plant permits.

Considering the above the location of Alternative 1 is noted as the preferred option due to its proximity to the R502 and distance away from the Vaal River. Should the mitigation measures be implemented, the proposed project is of low terrestrial biodiversity loss.

No fatal flaws have been identified and the Ecologist supports the proposed development provided the mitigation measures are implemented.

11 CONFIRMING STATEMENT

In terms of the national norms and best practice guideline for EGI standards, a confirming statement is required and is as follows:

1. The project area was assessed by Mr Mark Summers (Terrestrial Ecologist) from the 11th to the 13th of October 2022. The assessment was undertaken at the start of the wet growing season for the vegetation types on site;
2. Although the presence of Very High Sensitivity and Endangered Ecosystem types are present on site (in a secondary state), the continuation of existing land use practices around existing pylons and the minimal disturbance during construction, coupled with lack of disturbance during operation of pylons motivates for the site sensitivity to be reduced to Low.
3. Placement of pylons and road access within sensitive aquatic systems such as pans, wetlands, drainage lines and non-perennial streams must be avoided and must be placed adjacent to existing pylons associated with existing 132kV and 400kV power lines. This will decrease the likelihood of affecting protected plants and sensitive ecosystems (refer to Section 9.1).
4. According to the DFFE Screening tools and relevant SANBI Databases, the entire site is noted to be very high sensitivity, however on site verification of existing pylons, the secondary state of the threatened ecosystem and the prevailing land uses after powerline placement mean that sensitivities are limited to aquatic sensitives and are covered under an Aquatic Assessment. This is detailed in Section 7, Section 8 and Section 10.
5. After the assessment of the 500m corridor, two powerline options were assessed, which fell on either side of the existing powerlines. An assessment of alternatives resulted in powerline alternative 1 being selected as the preferred routing. This powerline is located closer to the main regional road, the R502 and will sit parallel to the existing 132kV powerline, so it will be of similar dimensions. This powerline is also further away from the Vaal River, which will reduce potential impacts from avifauna.
6. Construction of pylons must be outside of wetland and watercourse areas, as per the Aquatic Assessment report and their associated delineations, as potentially sensitive plant species are predicted to occur within these areas.
7. The mitigation hierarchy through an impact assessment was undertaken for the proposed project, and post mitigation risk was noted to be low;
8. No comments have been received from interested and affected parties.
9. Standard impact management guidance by the EGI guidelines is recommended. However, the following specific recommendations were also made:
    a. Pylons must be placed outside of pans, wetlands, drainage lines and rivers.
    b. Pylons should be placed adjacent to existing pylons (i.e. spanned across wet areas to avoid ground level impact).
    c. Vegetation clearance in the construction phase is to be remove in a phased approach, as and when it becomes necessary as vegetation harbours fauna.
    d. Existing access roads must be used as far as possible.
    e. Placement of bird flappers to deter avifauna from colliding with powerlines, particularly in the vicinity of pans and watercourses.
    f. All open excavations need to be checked on a daily basis and any fauna that may be stranded will have to be caught and released by a qualified person.
    g. Implement traffic control measures, including speed limits and no-go zones.
    h. Clearance should be limited to the location of each pylon only.

i. Clearance for construction should be done in a phased approach, and rehabilitation should be done as soon as work has ceased along the section of routing.
j. Areas outside of the construction zone must be demarcated as “no-go” areas.
k. Manual clearance of alien and invasive vegetation should be done so as to prevent the unnecessary movement of machinery in no-go areas.
l. An alien and invasive control programme should be implemented, particularly in areas where soil disturbance has occurred.
m. Monthly ECO auditing should occur during rehabilitation of the site. Once rehabilitation is complete, one three month, and one six month follow up audit should be conducted to assess the state of rehabilitation.

12 CONCLUSION

Based on the site verification and assessment of the proposed 132kV powerline from Leeudoringstad SPV facilities to the Vaal Ten Substation, the sensitivity of the Terrestrial Biodiversity Theme, Animal Theme and Plant Theme are regarded as Low due to the nature of the proposed project. This revises the DFFE themes from Very High to Low. This assessment is based on the following:

- The Plant Sensitivity Theme from the DFFE screening tool was revised from Medium to Low based on the limited construction footprint of the pylons over the 42km of power lines. The absence of georeferenced records of the highlighted species at the study site or within proximity to the site further reduces the site sensitivity.
- The Animal Sensitivity Theme from the DFFE screening tool was revised from High to Low based on the continuation of the existing land uses during construction and operation, therefore no material changes will occur to animal species on site.
- The Terrestrial Biodiversity Sensitivity Theme from the DFFE screening tool was revised from Very High to Low based on the limited construction footprint of the pylons and the rehabilitated state of the existing pylons running adjacent to the proposed powerline. This implies that loss of Endangered Vaal Vet Sandy Grassland and CBA 2, ESA 1 and ESA 2 areas is limited to just the footprint of the pylon itself. Further to note regarding Terrestrial Biodiversity Sensitivity Themes:
  - Land use has continued despite existing powerlines on site, so the overall loss of terrestrial biodiversity features is noted to be low.
  - The present endangered vegetation type is noted to be in a secondary, and overgrazed state in many areas. Powerlines will not pose and threat to this.
  - Ecosystem functioning and ecological corridors for fauna are maintained with powerlines.

No fatal flaws have been identified and the Ecologist supports the proposed development provided the mitigation measures are implemented.

Yours faithfully

Mark Summers (*Cand.Sci.Nat.)*
Ecological Specialist
SiVEST Environmental Division

Jake Alletson (*Pr.Sci.Nat.)*
Ecological and Wetland Specialist
Alletson Ecologicals

13 REFERENCES

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Skinner, J.D. & Smithers, R.H.N., (1990). *The Mammals of the Southern African Subregion* (2nd Edition). University of Pretoria, Pretoria, South Africa.

South African National Biodiversity Institute (SANBI) (2014). National Assessment: Red List of South African Plants version 2014.1

South African National Biodiversity Institute (SANBI) (2004). National Spatial Biodiversity Assessment: Ecosystem status of vegetation types derived from the new vegetation map of South Africa.

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Appendix 1

CV'S OF SPECIALISTS

CURRICULUM VITAE

Name	Mark Summers
Profession	Environmental Scientist
Name of Firm	SiVEST SA (Pty) Ltd
Present Appointment	Environmental Consultant
Years with Firm	4.5 years
Date of Birth	15 December 1990, Pietermaritzburg, South Africa
Nationality	South African
I.D. No.	9012155010081

Education

- National Senior Certificate, Maritzburg College, 2004-2008

Professional Qualifications

- B.Sc. (Ecological Sciences), University of KwaZulu-Natal PMB, KZN (2013)
- B.Sc. Honours (Zoology), University of KwaZulu-Natal PMB, KZN (2014)
- M.Sc. (Ecological Sciences), University of KwaZulu-Natal PMB, KZN (2016)

Membership to Professional Societies

- South African Council for Natural Scientific Professions (SACNASP) Can.Sci.Nat. Reg No. 120309 (2019)
- International Association for Impact Assessment South Africa (IAIAsa)

Employment Record

Jan 2018 – date	SiVEST SA (Pty) Ltd: Environmental Scientist
Oct 2016 – Dec 2017	JG Afrika (Pty) Ltd: Environmental Consultant
Feb 2016 – Jun 2016	SAEON: Plant community data entry and GIS analyst
Jan 2011	Ezemvelo KZN Wildlife: GIS Groundtruthing in Northern KZN

Language Proficiency

LANGUAGE	SPEAK	READ	WRITE
English	Fluent	Fluent	Fluent
Afrikaans	Fair	Fair	Fair

Years of Working Experience: 6 years

Countries of Work Experience

- South Africa

Fields of Specialisation

- Basic Assessments
- Environmental Compliance Monitoring
- Water Use Licence Applications
- Biodiversity Assessments

- Faunal Identification
- Avifaunal Identification
- Grass Identification
- Tree Identification
- GIS analysis (QGIS and ARCGIS)
- Statistical Analysis (SPSS, STATISTICA)

Overview

Mark has completed a Bachelor of Science Degree in Ecological Science (UKZN, PMB), a Bachelor of Science (Honours) Degree in Zoology (UKZN, PMB) and a Master of Science Degree (PMB) in Ecological Sciences with a focus on Population and Nesting Ecology of Nile crocodiles in Pongolapoort Dam. Additionally, Mark has been involved in plant community data capture and GIS analysis in the Drakensburg region of KwaZulu-Natal. He has been involved in Consulting since October 2016, with a focus on Environmental Compliance, Basic Assessments and Biodiversity Assessments in the Eastern Cape and KwaZulu-Natal Provinces. He has conducted assessments in the Biodiversity sector, with hopes of specialising in this field.

Projects Experience (by Sector)

ENVIRONMENTAL AUDITING / ENVIRONMENTAL CONTROL OFFICER

- Sanctuary Road Upgrade Slow Lane Upgrades: SANRAL c/o Naidu Consulting (Pty) Ltd (*Current*)
- Ntuzuma Unit D Phase 2 & 3 Housing Project: WK Construction *(Current)*
- Folweni Housing Project (Phases A,B and C), Ward 95: LA Consulting Engineers on behalf of Ethekwini Municipality *(Current)*
- Glen Arum Chicken Farm Shed and Waste Compliance : Glen Arum Farm (Pty) Ltd *(Current)*
- Engen Nongoma Petrol Filling Station: Engen Petroleum Limited *(Current)*
- Cornubia Business Hub : Tongaat Hulett Developments *(Current)*
- Peacevalley Road Upgrade: HN Consulting (*Current*)
- Merrivale Poultry Houses Construction (Midlands Eggs) : Merrivale Poultry Farm CC
- France Community Hall, Edendale, PMB: HN Consulting Engineers on behalf of Msunduzi Municipality *(Current)*
- Tayside High Lift Pump Station Upgrade and Rising Main Refurbishment: Mariswe (Pty) Ltd (*Current*)
- Driefontein Water Pipeline Phase 2 & 3A Extension: WRK Consulting *(Current)*
- Enguga, Entshayabantu and Macksam CWS Phase 5: Owethu Owabo Consulting, previously Sukuma Consulting *(Current)*
- Mount Verde Phase 2 Development: Mount Verde (Pty) Ltd (*Current)*
- MediMix Medical Facilities Development, Newmarket Park: Rejem Linton *JV (Completed May 2022)*
- Netcare Alberton Hospital: Rejem Linton Netcare JV c/o PROFICA *(Completed February 2022)*
- Mnguni (Mbambo) Road Upgrade: HN Consulting (*Completed November 2021*)
- Msunduzi PMB Bus Rapid Transport (BRT): Msunduzi Municipality c/o SiVEST Civil Engineering *(Completed April 2021)*
- Kwagqikazi TVET Campus : Fikile Construction c/o MSW Consulting *(Completed March 2022)*
- Msinga TVET Campus: Base Major Construction c/o MSW Consulting *(Completed January 2022)*
- Greytown TVET Campus: Motheo Construction c/o MSW Consulting *(Completed January 2022)*
- Trustfeeds Waste Water Treatment Works: Umgeni Water *(Completed January 2022)*
- Kwahlokohloko SSA1 Phase 1C Bulk Water Supply Upgrade: Eyethu Engineers on behalf of King Cetshwayo District Municipality *(Completed August 2021)*
- Construction of the Kokstad Stadium Sports Complex ECO: Greater Kokstad Municipality *(On Hold)*
- Dannhauser Bulk Water Supply Scheme: SiVEST Consulting Engineers *(Current)*
- Middeldrift SSA 2 Water Supply Scheme: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Current)*
- Middeldrift SSA 5 Phase 3 Water Supply Scheme: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Current)*
- Nongoma TVET Campus: Aveng Grinaker c/o MSW Consulting *(Completed November 2020)*

- Driefontein Water Pipeline: WRK Consulting *(Completed August 2020)*
- Driefontein Water Pipeline Phase 2: WRK Consulting *(Completed August 2020)*
- Middledrift SSA 5 (Emergency Line) Water Supply Scheme: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Completed August 2020)*
- Sumitomo Rubber Rehabilitation Close Out Report: Sumitomo Rubber *(Completed October 2018)*
- Fitty Park Community Water Supply Scheme ECO: Uthukela District Municipality c/o SiVEST Civil Engineering *(Completed August 2018)*

BASIC ASSESSMENTS / ENVIRONMENTAL IMPACT ASSESSMENTS

- Greater Ukuwela Nature Reserve BA: Wild Tomorrow Fund (*Current*)
- Goedehoop Waste Water Treatment Works BA: Amajuba District Municipality *(Current)*
- Maphumulo BWSS Phase 4 BA: Umgeni Water *(Current)*
- Dannhauser Bulk Water Supply Scheme BA: SiVEST Consulting Engineers *(Completed June 2019)*
- Chansbury Poultry Houses Basic Assessment: Chansbury Farming Trust *(Completed January 2020)*
- Gluckstaadt Water Supply Scheme Basic Assessment: Zululand District Municipality c/o SiVEST Civil Engineering
- Louriesfontein 3 PV Battery Energy Storage System (BESS) BA, Northern Cape – Mainstream *(Completed 2020)*
- Dwarsrug WEF PV Battery Energy Storage System (BESS) BA, Northern Cape – Mainstream *(Completed 2020)*
- Droogfontein 3 PV Battery Energy Storage System (BESS) BA, Northern Cape – Mainstream *(Completed 2020)*
- Mierdam PV Battery Energy Storage System (BESS) BA, Northern Cape – Mainstream *(Completed 2020)*
- Platsjambok East & West PV Battery Energy Storage System (BESS) BA, Northern Cape – Mainstream *(Completed 2020)*
- Oya Hybrid Energy Facility: G7 Renewable Energies *(Completed 2020)*

WATER USE LICENCE APPLICATIONS

- Menlyn Main WULA: Growthpoint Properties *(Current)*
- 50 Wierda Road WULA: Growthpoint Properties *(Current)*
- 151 on 5th WULA: Growthpoint Properties *(Current)*
- Riviera Office Park WULA: Growthpoint Properties *(Current)*
- 8 Rivonia Road WULA: Growthpoint Properties *(Current)*
- Woodmead Estate WULA: Growthpoint Properties (*Current*)
- Woodlands Office Park WULA: Growthpoint Properties *(Current)*
- Grayston Office Park WULA: Growthpoint Properties *(Current)*
- 42 Wierda Road Office Park WULA: Growthpoint Properties *(Current)*
- Nedan Facility WULA: PhilAfrica Foods (*Current*)
- CSP Site WULA: PhilAfrica Foods (*Current*)
- King Shaka International Airport Constructed Wetlands WULA: Airports Company South Africa (*Current*)
- Tayside Water Supply Scheme WULA: Mariswe (Pty) Ltd (*Current*)
- Signal Hill WULA: Umsunduzi Municipality (*Current*)
- Dannhauser Bulk Water Supply Scheme, Amajuba District Municipality *(Complete)*
- Gluckstaadt Water Supply Scheme WULA: Zululand District Municipality c/o SiVEST Civil Engineering *(Current)*
- Peacevalley Road Upgrade General Authorisation: HN Consulting (*Completed January 2022*)
- Maphumulo BWSS Phase 4: Umgeni Water *(Current)*
- Ngala Safari Lodge : AndBeyond (*Current*)
- Leeudoringstad PV Facilities (Leeubosch and Wildebeestkuil) : Upgrade Energy Africa *(Current)*

WATER USE LICENCE COMPLIANCE AUDITING

- Manyoni Private Game Reserve Annual Water Use Licence Compliance Audit (2021): ZRR Water Users (Pty) Ltd
- Darvill Waste Water Treatment Works Constructed Wetlands Annual Compliance Audit (2021) of Water Use Licence: Umgeni Water
- Trustfeeds Waste Water Treatment Works Annual Compliance Audit (2021) of Water Use Licence: Umgeni Water
- Manyoni Private Game Reserve Annual Water Use Licence Compliance Audit (2020): ZRR Water Users (Pty) Ltd
- Manyoni Annual Water Use Licence Compliance Audit (2019): Manyoni Private Game Reserve

ECOLOGICAL/BIODIVERSITY ASSESSMENTS

- Ntunjambili Biodiversity Studies: Black Cubans Consulting *(Completed October 2018)*
- Middleburg Biodiversity Studies: Steve Tshwete Local Municipality *(Completed July 2018)*
- N3 New England Road Upgrade Faunal Study: KSEMS Environmental Consulting *(Completed October 2019)*
- Umlaas Gate Development Faunal Study: EcoPulse Consulting *(Completed January 2019)*
- Richards Bay Port Biodiversity Assessment: Transnet National Ports Authority *(Completed July 2018)*
- Underberg Dairy S24G Faunal Assessment: Underberg Dairy (Pty) Ltd *(Completed October 2019)*
- Babanango Faunal Species List: Nature Stamp *(Completed November 2019).*
- Gluckstaadt Water Supply Scheme Faunal Assessment: Zululand District Municipality c/o SiVEST Civil Engineering *(Current)*
- Shayamoya Housing Development Vegetation Assessment: Greater Kokstad Municipality *(Completed February 2020)*
- Trustfeeds Waste Water Treatment Works Plant Permits: Umgeni Water *(Complete March 2018)*
- Middledrift SSA 5 – 3 Water Supply Scheme Plant Permits: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Completed January 2020)*
- Middledrift SSA 5 (Emergency Line) Water Supply Scheme Plant Permits: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Completed July 2019)*
- Middledrift SSA 2 Water Supply Scheme Plant Permits: King Cetshwayo District Municipality c/o SiVEST Civil Engineering *(Completed July 2019)*
- Dannhauser Bulk Water Supply Scheme Plant Permits: SiVEST Consulting Engineers *(Completed March 2020)*
- D365 Road Upgrade: Black Cubans Consulting (*Completed January 2021*)
- Bergville Culverts Biodiversity Assessment L2013: At Gedezar Consulting (*Completed Jan 2021*)
- Bergville Culverts Biodiversity Assessment L1526-1: At Gedezar Consulting (*Completed Jan 2021*)
- Bergville Culverts Biodiversity Assessment L1526-2: At Gedezar Consulting (*Completed Jan 2021*)
- Bergville Culverts Biodiversity Assessment L1511: At Gedezar Consulting (*Completed Jan 2021*)
- Mnqumeni Water Supply Scheme Biodiversity Assessment: GIBB (*Completed May 2021*)
- France Community Hall Biodiversity Screening: HN Consulting (*Completed February 2021*)
- Dannhauser Cemetery Biodiversity Assessment: Dannhauser Local Municipality (*Completed May 2021)*
- Greater Ukuwela Nature Reserve Biodiversity Assessment: Wild Tomorrow Fund (*Completed 2022*)
- Richmond Ntuzuma Housing Biodiversity Assessment: LA Consulting Engineers (*Completed 2022*)
- Umlazi Housing Biodiversity Assessment: LA Consulting Engineers (*Completed 2022*)
- Tiffany's Spar Extension Biodiversity Assessment: JDJ Properties (*Completed 2022*)
- Goedehoop Waste Water Treatment Works: Amajuba District Municipality (*Completed 2022*)
- Reddam House Umhlanga: Inspired Schools *(Current)*
- Leeudoringstad 132kV Powerline: Upgrade Energy Africa *(Current)*

VISUAL ASSESSMENTS

- Pofadder Wind Energy Farm Visual Impact Assessment: Arcus Consulting Services SA *(Completed November 2018)*

- Rondekop Wind Energy Farm Visual Impact Assessment: G7 Energies *(Completed October 2018)*
- Gromis Komas Wind Energy Farm Visual Impact Assessment: CSIR *(Completed February 2020)*
- Leeuwbosch Solar PV Visual Impact Assessment: Upgrade Energy (*Completed August 2020*)
- Wilderbeestkuil Solar PV Visual Impact Assessment: Upgrade Energy (*Completed August 2020*)
- Oya Solar PV Visual Impact Assessment: G7 Renewable Energies (*Completed July 2020*)
- Rinkhals Solar PV Facilities: ABO Renewable Energies (*Completed*)
- Kentani Powerline: SLR Consulting *(Completed 2021)*

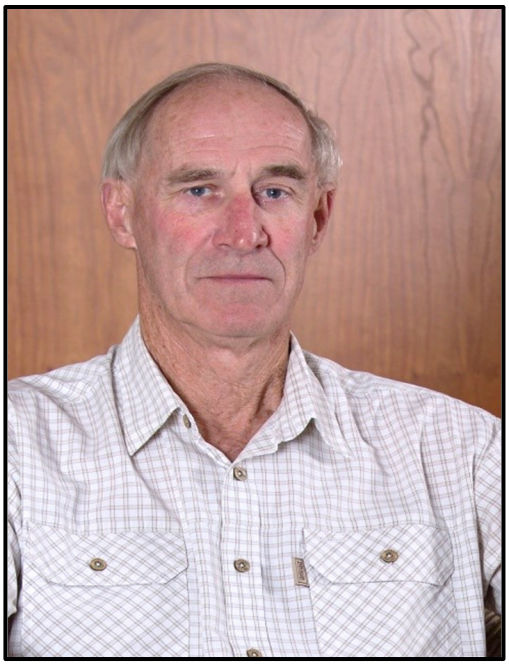
OTHER APPLICATIONS/ASSESSMENTS

- Glen Arum Farm 24G Application: Glen Arum Farm (Pty) Ltd *(Completed April 2020)*
- Phinda Nature Reserve Maintenance Management Plan: Mun-Ya-Wana Conservancy *(Completed)*
- Bishopstowe Strategic Environmental Assessment: Msunduzi Municipality *(Completed September 2018)*
- DTP State of Environment Report: Dube TradePort Corporation *(Completed May 2018)*
- Tembe Ndumo Tourism Plan: Peace Parks (*Completed*)
- Cape Floral Kingdom EMF Status Quo: Department of Environmental Affairs *(On Hold)*

Other Experience

- Reconstruction of the Sand River Bridge, St Francis Bay: BVi Consulting Engineers.
- Driftsands Expansion of the Waste Water Treatment works: Bosch Holdings.
- Proposed Upgrade of the Grassridge – Sunnyside – Melkhout 132kV Powerline, Eastern Cape Province: ESKOM SOC Ltd.
- Construction of the Tombo – Mafini 132kV Powerline, Port St Johns: ESKOM SOC Ltd.
- GIS and data input of plant community data in the Drakensberg region of KwaZulu-Natal: South African Environmental Observation Network (SAEON)
- Groundtruthing of Roads and Assets in EKZN Wildlife protected areas: Ezemvelo KZN Wildlife

DACRE JAMES ALLETSON



Profession	*ENVIRONMENTAL SCIENTIST*
Position in Firm	*OWNER: ALLETSON ECOLOGICALS*
Area of Specialisation	*PRELIMINARY ENVIRONMENTAL ASSESSMENT, TERRESTRIAL FAUNA AND FLORA SURVEYS, AQUATIC BIODIVERSITY SURVEYS, WETLAND DELINEATION AND ASSESSMENT, ENVIRONMENTAL CONTROL OFFICER DUTIES; ENVIRONMENTAL MANAGEMENT PROGRAMMES, ENVIRONMENTAL IMPACT ASSESSMENTS, SCOPING REPORTS*
Qualifications	*BSc, BSc (Hons)*
Years of Experience	*50*
Years with Firm	*25*

SUMMARY OF EXPERIENCE

Mr Alletson has long experience in the fields of conservation and management of the natural environment and has specialised in aquatic species and systems. After graduating he was employed at the Oceanographic Research Institute in Durban where he worked on a number of projects in both the estuarine and marine environments. In 1975 he joined to the Natal Parks Board where he served for 21 years in a number of positions. His activities in this time included research and management of certain fish species, management of a trout hatchery, provision of an extension service relating to wetlands and rivers, and participation in management of game and nature reserves, including drafting of management plans. From 1984 onwards he served as the Board's river and wetland specialist ecologist and was involved in wetland-related research and management activities.

In 1997 he formed Alletson Ecologicals, an environmental consultancy and has undertaken a wide variety of environmental investigation and monitoring programmes. Amongst these are some 100 Environmental Impact Assessments which ranged from developments such as timber planting permits, gravel pits, and irrigation dams, through to coal mines, large state dams, housing schemes, private property developments, and pipelines.

Mr Alletson has also taken part in regional planning studies for the Town and Regional Planning Commission and has contributed toward integrated management plans for conservation areas and projects.

Since 2012 Mr Alletson has largely consulted to JG Afrika but also serves a wide variety of other clients, both corporate and private. Amongst other activities he has undertaken numerous wetland delineations and assessments, and also aquatic surveys for river health assessments and Water Use Licence Applications. He also undertakes terrestrial biodiversity surveys as components of impact assessments, planning projects, and monitoring programmes.

EDUCATION

Date (from – to):	1966-1969
Degree/Institution:	BSc – Biological Sciences (University of Natal – now University of KwaZulu-Natal)
Date (from – to):	1972
Degree/Institution:	B.Sc Honours – Zoology (Rhodes University)
Other Training:	**1974:** Basic Business Management - Durban Technical College **1983:** Public Speaking and Visual Aid Preparation - Natal Parks Board. **1985:** Grassland Management and Assessment - Natal Parks Board. **1998:** SASS Biomonitoring Procedure for Assessment of River Health - Umgeni Water. **1970:** Small Craft Skipper's Certificate, and Port of Durban Operators Certificate. **2015:** Wetland Buffer Determination Course – Water Research Commission. **2018:** Biodiversity Offset Training Course – South African National Biodiversity Institute.

EMPLOYMENT RECORD

Date (from – to)	1966 - 1971
Location	Durban, South Africa
Employer	Oceanographic Research Institute
Position(s)	Research Technician then Research Officer
Description	Provision of technical assistance on marine and estuarine research programmes. Conducted research on commercially exploited deep sea crustaceans and assisted with other marine research programmes.
Date (from – to)	1972
Location	Rhodes University, Grahamstown, South Africa
Position(s)	Student
Description	BSc Honours
Date (from – to)	1975 – 1996
Location	KwaZulu-Natal, South Africa
Employer	Natal Parks Board
Position(s)	Research Officer
Description	Research and management relating to conservation of rivers, wetlands, and aquatic species. Contribution relevant inputs to an extension programme for landowners, and to management of aquatic systems in game and nature reserves. Also undertook conservation planning and developed the KwaZulu-Natal Environmental Atlas.
Date (from – to)	1997 – present
Location	Pietermaritzburg, KwaZulu-Natal, South Africa
Employer	Alletson Ecologicals
Position(s)	Environmental Scientist

Description	The consultancy has undertaken many environmental consulting projects for various clients ranging from individual landowners to government departments.

PROJECT EXPERIENCE

Biodiversity and Wetland Assessment Projects

Name of Project:	**Desktop wetland screening and classification assessment on various properties within the Umdloti, Tongaat and Umhlali Catchment Areas for suitability to meet offsite wetland mitigation obligations for Dube Tradezone 2, Agrizone 2, Support Zone 2 And Tradezone 3**
Client:	Dube TradePort Corporation
Project duration/date:	2020 to 2021 Ongoing
Job Title and Duties:	Wetland and Biodiversity Specialist Screening of three wetland sites for possible use in offsetting wetland loss at the Dube TradePort Complex and then putting forward selection recommendations.
Name of Project:	**Assessment of the wetlands in the vicinity of the Lafarge Cement Factory In Lichtenburg together with management recommendations**
Client:	Greenmined Environmental
Project duration/date:	January April 2021
Job Title and Duties:	Wetland and Biodiversity Specialist A section of wetland that has been infilled is to be rehabilitated or the damage repaired. The findings of a survey and management recommendations are put forward.
Name of Project:	**Findings of an aquatic survey done in regard to the upgrading of a rural water supply scheme on the Ibisi River, KwaZulu-Natal**
Client:	SiVEST SA (Pty) Ltd
Project duration/date:	April - May 2021
Job Title and Duties:	Wetland Specialist Undertaking the wetland specialist study in support of the application for environmental authorisation for a water scheme upgrade.
Name of Project:	**Consideration of the possible risks to wetlands and watercourses along the routes of the bulk pipelines of the proposed Gunjana Community Water Scheme upgrade**
Client:	JG Afrika (Pty) Ltd
Project duration/date:	June to July 2020
Job Title and Duties:	Wetland Specialist Construction and upgrade of a rural potable water scheme near Pomeroy, KwaZulu-Natal, is planned. In terms of the National Water Act, 1998 (Act No. 36 of 1998) attention must be given to wetlands and watercourses as a Water Use Licence may be necessary. This study assesses the watercourse crossings and the risks posed to the aquatic systems. It then puts forward a series of management recommendations.

Name of Project:	**Consideration of the possible risks to wetlands and watercourses as a result of upgrading two sections of Road P419 Near Bulwer, Kwazulu-Natal**
Client:	Ilifa Africa Engineers (Pty) Ltd
Project duration/date:	March – April 2020
Job Title and Duties:	Wetland Specialist A total of 10 km of road which was to be upgraded from a gravel surface to a tar surface were surveyed. Some 19 watercourse crossings were found although most were small seasonal channels. No wetlands were crossed but, in keeping with the National Water Act (Act No. 36 of 1998), wetlands within 500 m of the site were examined and one required management recommendations for the road construction phase.
Name of Project:	**Southport Housing Project Vegetation and Estuarine Survey**
Client:	**Private landowner**
Project duration/date:	2019
Job Title and Duties:	Wetland and Vegetation Specialist. The vegetation at the site of a proposed housing project, as well as a nearby stream and the Umhlangamkulu River Estuary were surveyed and assessed. Management recommendations were put forward.
Name of Project:	**Rocabar Project Roads Assessment.**
Client:	Private landowner
Project duration/date:	2019
Job Title and Duties:	Wetland and Biodiversity Specialist. The area around the proposed Rocabar commercial development in Kokstad was considered in relation to the impacts of access roads on wetlands. Management recommendations were put forward.
Name of Project:	**Assessment of the terrestrial biodiversity in relation to the upgrade of a treatment works and a new potable water pipeline near Moyeni/Zwelisha, Kwazulu-Natal**
Client:	JG Afrika (Pty) Ltd
Project duration/date:	April 2021 - ongoing
Job Title and Duties:	Biodiversity and Wetland Specialist The terrestrial and aquatic biodiversity in the vicinity of a water treatment works and along a new bulk main pipeline have been assessed and management recommendations are put forward.
Name of Project:	**Road R61 Upgrade**
Client:	SANRAL SOC
Project duration/date:	2019
Job Title and Duties:	Wetland and Biodiversity Specialist. The rivers, wetlands, and vegetation along a 24 km section of Road R61 were surveyed and assessed together with a vegetation specialist. Especial

	attention was given to the larger rivers as their nearby estuaries are of high importance. Management recommendations were put forward.
Name of Project:	**Widening of the N2 Freeway between the Isipingo Interchange and the Edwin Swales Interchange**
Client:	SANRAL SOC
Project duration/date:	2020
Job Title and Duties:	Wetland and Biodiversity Specialist. The rivers, wetlands, and vegetation along a 12 km section of National Road N2 (Section 25), including the Higginson Highway Interchange, were surveyed and assessed. Especial attention was given to watercourse crossings and to the Umhlatuzana and Mbilo Rivers as they are of high importance since they discharge into Durban Bay. Management recommendations were put forward.
Name of Project:	**Assessment of the possible risks to Wetlands and Watercourses as a result of the construction of the Greater Kilimon Water Scheme near Coleford, Kwazulu-Natal**
Client:	iMvula Engineers
Project duration/date:	December 2019 – April 2020
Job Title and Duties:	Biodiversity, Wetland and River Specialist. The routes of some 82 km of pipelines as well as the sites of 11 reservoirs, a water abstraction works, and a water treatment works were assessed in regard to biodiversity, wetlands and watercourses. The work was done for both EIA and Water Use Licence purposes. The report included management recommendations as well as risk assessment.
Name of Project:	**Consideration of Impacts, and Determination of a Possible Offset Area, in Relation to the Proposed Sokhulu Agricultural Project**
Client:	Department of Rural Development and Land Affairs
Project duration/date:	2018
Job Title and Duties:	Wetland Specialist. Surveys of wetlands on the Mfolozi/Umsunduze rivers floodplain were undertaken in relation to rehabilitation of an old agricultural project. Management recommendations were prepared and wetlands offsets were proposed.
Name of Project:	**Biodiversity, River and Wetland Assessments associated with the proposed upgrade of housing and services in Ngwelezane, KwaZulu-Natal**
Client:	City of Mhlatuze
Project duration/date:	2018
Job Title and Duties:	Wetland and Biodiversity Specialist. Surveys were done on the wetlands and river in the vicinity of Ngwelezane in relation to the provision of new housing and municipal infrastructure.
Name of Project:	**Biodiversity and Wetland Survey for a Bulk Water Supply Upgrade for the Estcourt Industrial Area**
Client:	uThukela District Municipality
Project duration/date:	2017 - 2018
Job Title and Duties:	Wetland and Biodiversity Specialist. Conducted surveys along the routes of several pipelines. The wetlands were assessed, and management recommendations were put forward.

Name of Project:	**Wetlands Search and Delineation Along the Route of a Proposed New Bulk Raw Water Supply Pipeline from Spioenkop Dam to Ladysmith Water Treatment Works**
Client:	uThukela District Municipality
Project duration/date:	2015
Job Title and Duties:	Wetland Specialist. Searches for wetlands along the proposed pipeline route were undertaken and the systems found were delineated and assessed. Terrestrial biodiversity surveys were also undertaken at the same time.
Name of Project:	**Biodiversity Assessment – Proposed New Durban Dig-out Container Port**
Client:	Transnet SOE
Project duration/date:	2012 - 2013
Job Title and Duties:	Survey Team Leader. Assembled a team of biodiversity specialist to undertake surveys of the terrestrial biodiversity (mammals, birds, reptiles, amphibians, vegetation) and wetland biodiversity at the site of the old Durban Airport in relation to the proposed excavation of a new container shipping terminal. Also undertook wetland and biodiversity surveys and much of the final data compilation and reporting.

CONTINUED PROFESSIONAL DEVELOPMENT

Courses, Conferences & Workshops

2019 (October) - IAIAsa Biodiversity Offsets Workshop
2018 (November) - Biodiversity Offset Training (Course)
2015 (April) - Wetland Buffer Determination (Workshop)

PERSONAL DETAILS

Nationality – South African
Date of Birth – 10 April 1948
Domicile – Hilton, KwaZulu-Natal, South Africa

Languages

Language	Reading	Speaking	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Fair	Poor
Zulu	Nil	Communication	Nil

PROFESSIONAL REGISTRATION AND SOCIETY MEMBERSHIP:

- ✓ South African Council for Natural Scientific Professionals. Registration No. 125697. Ecological Science.
- ✓ International Association of Impact Assessors – South Africa Suite, Membership Number 035.
- ✓ Water Research Commission. Certified SASS Practitioner.