



TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED D3 ENERGY PRODUCTION RIGHT APPLICATION

**Matjhabeng and Masilonyana Local Municipalities,
Lejweleputswa District Municipality, Free State
Province, South Africa**

16 September 2026

Prepared by:

The Biodiversity Company

Cell: +27 81 319 1225

Fax: +27 86 527 1965

info@thebiodiversitycompany.com

www.thebiodiversitycompany.com

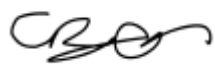
Report Name	TERRESTRIAL BIODIVERSITY ASSESSMENT FOR THE PROPOSED D3 ENERGY PRODUCTION RIGHT APPLICATION	
Specialist Theme	Terrestrial Biodiversity, Plant and Animal Theme	
Project Reference	D3 Energy Production Right	
Report Version	16 September 2026	
Environmental Assessment Practitioner		
Responsible Specialist	Martinus Erasmus (Pri. Sci. Nat. 118630)	
	Connor Ryan (Cand. Sci. Nat. 174067)	
	Brittney Jamieson (Cand. Sci. Nat. 178794)	
Technical Support	Lize Timmerman (Cand. Sci. Nat. 158700)	
Declaration	The Biodiversity Company and its associates operate as independent consultants under the auspice of the South African Council for Natural Scientific Professions. We declare that we have no affiliation with or vested financial interests in the proponent, other than for work performed under the Environmental Impact Assessment Regulations, Amended. We have no conflicting interests in the undertaking of this activity and have no interests in secondary developments resulting from the authorisation of this project. We have no vested interest in the project, other than to provide a professional service within the constraints of the project (timing, time and budget) based on the principals of science.	

Table of Contents

1	Introduction.....	7
1.1	Background	7
1.2	Project Description	8
1.3	Scope of Work.....	9
1.4	Assumptions and Limitations	9
1.5	Key Legislative Requirements.....	10
2	Fieldwork	11
2.1	Biodiversity Field Assessment	11
3	Results & Discussion	12
3.1	Desktop Baseline	12
3.1.1	Ecologically Important Landscape Features	12
3.1.2	Flora Assessment.....	21
3.1.3	Fauna Assessment	26
3.2	Fieldwork Findings	30
3.2.1	Field Assessment.....	30
3.2.2	Flora Assessment.....	39
3.2.3	Fauna Assessment	41
3.3	Habitat Assessment	44
3.4	Site Ecological Importance.....	47
3.4.1	Desktop Ecological Sensitivity	52
3.4.2	DFFE National Environmental Screening Tool Comparison.....	56
4	Impact Risk Assessment.....	57
4.1	Biodiversity Risk Assessment	57
4.2	Present Impacts to Biodiversity.....	57
4.3	Alternatives Considered	57
4.4	Irreplaceable Loss	57
4.5	Identification of Additional Potential Impacts	58
4.6	Quantitative Impact Assessment.....	59
4.6.1	Construction/Operational Phase	60
4.6.2	Closure Phase	62
4.7	No-Go Scenario.....	63
5	Conclusion.....	68

5.1	Impact Statement	70
5.2	Specialist Opinion	70
6	References	71
7	Appendix Items	73
7.1	Appendix A: Methods	73
7.1.1	Desktop Dataset Assessment	73
7.1.2	Desktop Flora Assessment	74
7.1.3	Desktop Fauna Assessment	75
7.1.4	Vegetation & Flora Survey	76
7.2	Appendix B: Terrestrial Site Ecological Importance	78
7.3	Appendix C: Expected Species Lists	82
7.3.1	Expected Flora Species	82
7.3.2	Expected Mammal Species	88
7.3.3	Expected Reptile Species	88
7.3.4	Expected Amphibian Species	88
7.3.5	Expected Avifauna Species	89
7.4	Appendix D: Specialist Declaration of Independence	96
7.5	Appendix E: Specialist CVs	97

List of Tables

Table 1-1	A list of key legislative requirements	10
Table 3-1	Summary of relevance of the proposed project to ecologically important landscape features	12
Table 3-2	List of Sensitive Species of Conservation Concern that may occur in the Desktop PAOI and Project Area. (VU = Vulnerable, LC = Least Concern and NT = Near Threatened).	26
Table 3-3	Threatened mammal species that are expected to occur within the Desktop PAOI and Project Area (NT = Near threatened; VU = Vulnerable).....	26
Table 3-4	Threatened amphibian SCC that are expected to occur within the Desktop PAOI and Project Area. (LC = Least Concern and NT = Near Threatened).....	27
Table 3-5	Threatened avifauna species that are expected to occur within the Desktop PAOI and Project Area (LoO=Likelihood of occurrence LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)	27
Table 3-6	Sensitivity summary of the habitat types delineated within the PAOI.	30
Table 3-7	Table presenting the alien and invasive species recorded for the PAOI	41
Table 3-8	Table presenting the mammal species recorded for the Project Area during the field survey (LC = Least Concern and NT = Near Threatened).....	42
Table 3-9	Table presenting the reptile and amphibian species recorded for the Project Area during the field survey (LC = Least Concern).....	43
Table 3-10	Table presenting the avifauna species recorded for the PAOI during the field survey	43
Table 3-11	Table providing descriptions of the habitat types	44
Table 3-12	Summary of habitat types delineated within Project Area	47
Table 3-13	Summary of habitat types delineated within Desktop PAOI.....	49
Table 3-14	Summary of the DFFE screening tool vs specialist assigned sensitivities for the Target areas.....	56
Table 4-1	Summary of potential impacts to biodiversity associated with the proposed activity.....	58
Table 4-2	Assessment of significance of impacts on the terrestrial fauna and flora associated with the project.....	64
Table 5-1	Summary of Habitat Units, Condition, Sensitivity, Biodiversity Spatial Planning Categories, and Development Potential for the D3 Energy Production Right Project Area	69
Table 7-1	Summary of Conservation Importance (CI) criteria.....	78
Table 7-2	Summary of Functional Integrity (FI) criteria.....	79
Table 7-3	Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)	79
Table 7-4	Summary of Receptor Resilience (RR) criteria	80
Table 7-5	Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)	80

Table 7-6	Guideline for interpreting Site Ecological Importance in the context of proposed activities	81
-----------	---	----

List of Figures

Figure 1-1	Map illustrating the regional context of the Production Right	8
Figure 1-2	Map illustrating the proposed project layout (Provided by EIMS, 2026)	8
Figure 2-1	Map illustrating the field tracks of the field survey within the Project Area.	11
Figure 3-1	Map illustrating the ecosystem threat status associated with the Desktop PAOI and Project Area (NBA, 2022)	13
Figure 3-2	Map illustrating the ecosystem threat status associated with the Desktop PAOI and Project Area (NBA, 2025)	14
Figure 3-3	Map illustrating the ecosystem protection level associated with the Desktop PAOI and Project Area (NBA, 2022)	15
Figure 3-4	Map illustrating the ecosystem protection level associated with the Desktop PAOI and Project Area (NBA, 2025)	16
Figure 3-5	Map illustrating the Desktop PAOI and Project Area in relation to the Free State Terrestrial CBA Plan	17
Figure 3-6	Map illustrating the NPAES focus areas and their proximity to the Desktop PAOI and Project Area	18
Figure 3-7	Map illustrating the location of the Protected Areas proximal to the Desktop PAOI and Project Area	19
Figure 3-9	Map illustrating the Desktop PAOI and Project Area in relation to the South African Inventory of Inland Aquatic Ecosystems dataset	20
Figure 3-11	Map illustrating the Desktop PAOI and Project Area in relation to the National Freshwater Ecosystem Priority Area dataset	21
Figure 3-13	Map illustrating the vegetation types associated with the PAOI	22
Figure 3-14	Habitat Units Delineated for the Desktop PAOI	46
Figure 3-15	Habitat Units Delineated for the Project Area	47
Figure 3-16	Site Ecological Importance of the Project Area	49
Figure 3-17	Site Ecological Importance of the Desktop PAOI	51
Figure 3-18	Map from DFFE National Environmental Screening Tool Report depicting the relative terrestrial biodiversity theme sensitivity for the Desktop PAOI and Project Area	53
Figure 3-19	Map from DFFE National Environmental Screening Tool Report depicting the relative plant species theme sensitivity for the Desktop PAOI and Project Area	54
Figure 3-20	Map from DFFE National Environmental Screening Tool Report depicting the relative animal species theme sensitivity for the Desktop PAOI and Project Area	55
Figure 5-1	Map illustrating the PAOI in relation to the Free State Biodiversity Spatial Plan and Remnants dataset	70

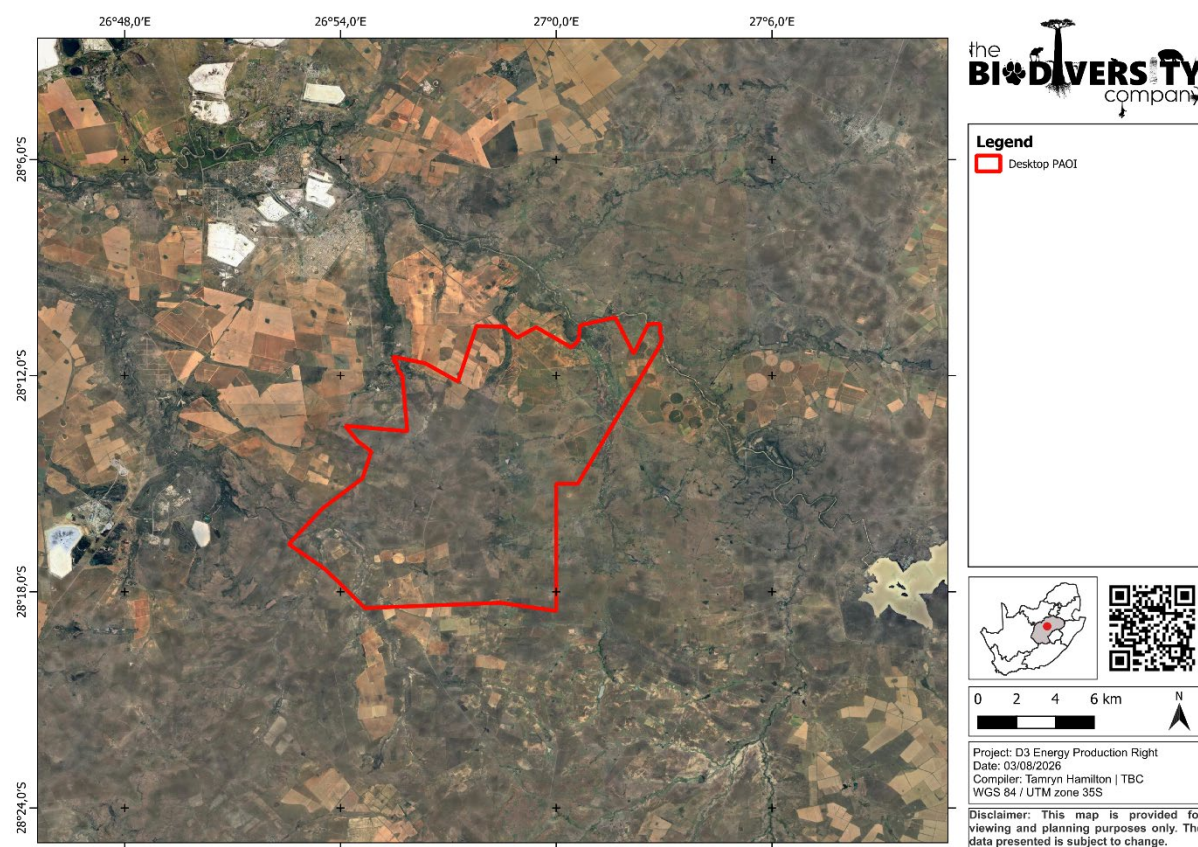
Figure 7-1 Map illustrating extent of area used to obtain the expected flora species list from the iNaturalist database. The yellow dots indicate the approximate location of the PAOI..... 75

1 Introduction

1.1 Background

The Biodiversity Company (TBC) was appointed by Environmental Impact Management Services (Pty) Ltd (EIMS) on behalf of D3 Energy South Africa (Pty) Ltd to undertake a Terrestrial Biodiversity Assessment for the proposed D3 Energy Production Right Area. The proposed project covers an area of approximately 14 386 ha across multiple farm portions. It is located approximately 12 km southeast of Virginia Town in the Free State Province, within the Matjhabeng and Masilonyana Local Municipalities, and the Lejweleputswa District Municipality (Figure 1-1). For the purposes of this report, reference is made either to the Desktop Project Area of Influence (Desktop PAOI)¹ or to the Project Area (Seismic Transects)², rather than to a general Project Area of Influence (PAOI). The Desktop PAOI (depicted by the blue outline in Figure 1-2) represents the broader area identified during the desktop assessment, while the Project Area comprise the target areas assessed in detail, including a 500 m buffer around the gathering lines, seismic transects, well locations, and gas plant locations (Figure 1-2).

The purpose of the specialist studies is to provide relevant input into the impact assessment process and to provide a report for the proposed activities associated with the development. This report, after taking into consideration the findings and recommendations provided by the specialist herein, should inform and guide the Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.



¹ The Desktop PAOI refers to areas that were not assessed during the site assessment but were instead evaluated from a desktop perspective. However, within the Desktop PAOI, an area known as the Project Area was ground-truthed during the site assessment (see footnote 2 for more information on Seismic Transects).

² Throughout this report, any reference to "Project Area" should be understood to include the seismic transects together with the 500 m buffer and all associated components, such as gathering lines, well locations, and gas plant locations. All assessments, findings, and discussions related to Seismic Transects are therefore based on this buffered area and its various components.

Figure 1-1 Map illustrating the regional context of the Production Right

1.2 Project Description

The following information has been received from EIMS regarding the undertaking of an Environmental Impact Assessment (EIA) for the planned D3 Energy Production Right Area.

As part of this proposed production right, ongoing exploration and production drilling and seismic activities are anticipated, including initial seismic transects.

The development also includes trenched subsurface gas gathering pipelines, which will follow designated routes to convey gas to a local production facility. This network of pipelines is intended to transport gas to a local production facility. At this facility, the gas will first be compressed to produce compressed Helium and Methane as an initial product. In a subsequent phase, the gas will be liquefied to produce Liquefied Natural Gas (LNG). The layout of the proposed project can be seen in Figure 1-2.

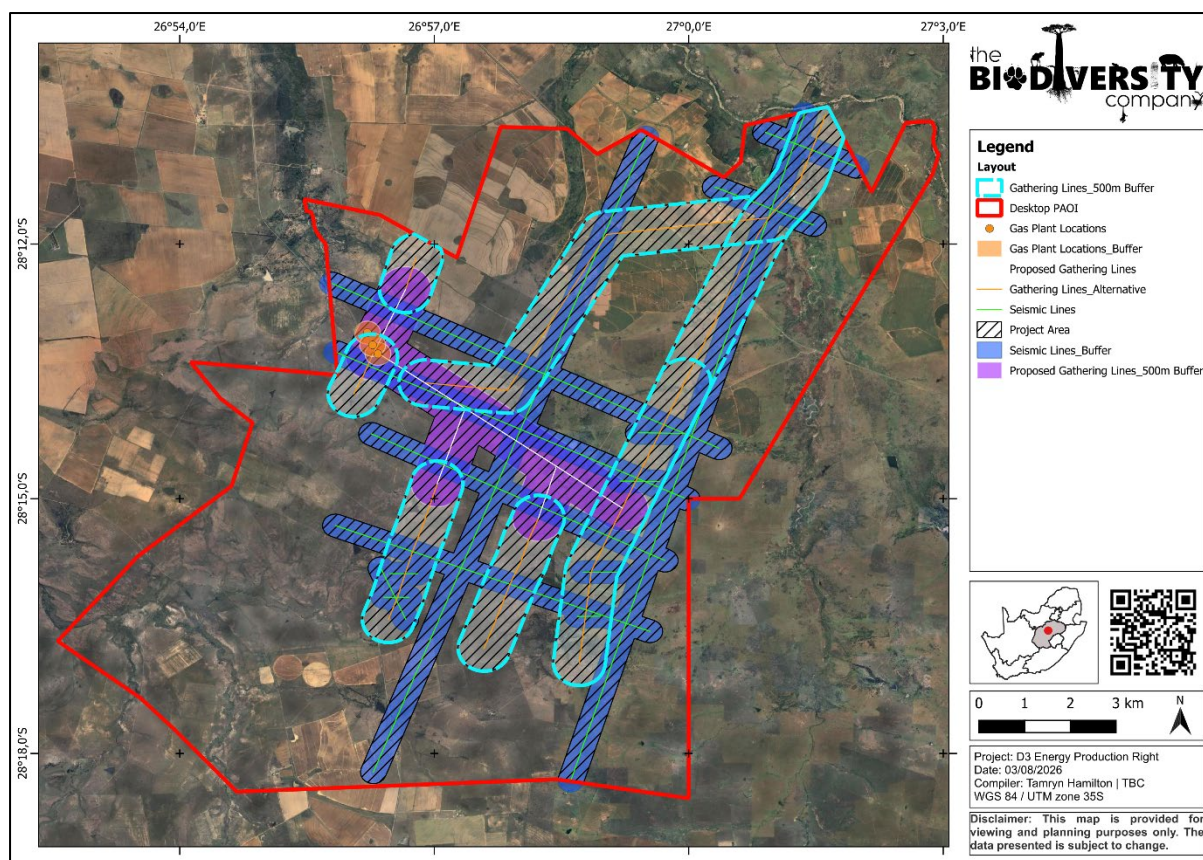


Figure 1-2 Map illustrating the proposed project layout (Provided by EIMS, 2026)

1.3 Scope of Work

The aim of the biodiversity assessment was to provide information to guide the risk of the proposed activity to the current state of the associated ecosystems within the development area. This was achieved through the following:

- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI and surrounding landscape;
- Desktop assessment to compile an expected species list and identify possible Species of Conservation Concern (SCC) that occur within the PAOI and surrounding landscape;
- Field survey to record flora and fauna species, especially Species of Conservation Concern (SCC);
- Determination of the Site Ecological Importance (SEI), also commonly referred to as sensitivity;
- A biodiversity impact assessment; and
- The prescription of mitigation measures for identified potential impacts, including assigning buffer areas, where necessary.

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable for this assessment:

- It is assumed that all information received from the client/EAP is accurate;
- The specialist was not provided with an architectural plan or any engineering drawings with regard to the planned development activities and, as such, the potential impacts arising from these activities may only be assumed based on preliminary schematic design and on previous experience;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- The assessment area (Desktop PAOI and Project Area) was based on the footprint areas as provided by the client/EAP, and any alterations to the area and/or missing Geographic Information System (GIS) information pertaining to the assessment area would have affected the area surveyed and hence the results of this assessment;
- A previous field survey was undertaken from 16th till 19th of March 2026, in the wet season. Which is considered a suitable time for data collection within this habitat in accordance with the Species Environmental Assessment Guideline (SANBI, 2026, pg. 57), however the Project Area layout changed slightly and as a result the unsurveyed areas were targeted in a second survey from the 15th to the 16th of July 2026, dry season, which is not considered the optimal sampling period;
- This assessment was conducted in accordance with the Environmental Impact Assessment Regulations, 2014 (GN R.982 in Government Gazette 38282 of 4 December 2014), as amended, including GN R.326 of 7 April 2017, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998). The approach has taken cognisance of Government Notice 320 in Government Gazette 43110 dated 20 March 2020, which gazetted the protocols for specialist assessment and minimum report content

requirements for environmental impacts on terrestrial and aquatic biodiversity; Government Notice 1150 in Government Gazette 43855 dated 30 October 2020, which published the protocols for specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal and plant species; and Government Notice 3717 in Government Gazette 49028 dated 28 July 2023. This assessment does not consider temporal trends (note that the data collected is, however, considered sufficient to derive a meaningful baseline);

- Different portions of the Project Area were not assessed due to access limitations;
- Whilst every effort was made to cover as much of the Project Area as possible, it is possible that some plant and animal species that are present within the Project Area were not recorded during the field investigations. However, it is the opinion of the specialist that an accurate representative sample of the ecological components considered within this assessment was collected;
- Only the Project Area was ground truthed.
- The Water Resources within this report was assessed from a Terrestrial perspective. Please refer to the Wetland Impact Assessment (TBC, 2026) for information pertaining to these systems; and
- The Global Positioning System (GPS) used in the assessment has an accuracy of 5 m and consequently any spatial features may be offset by up to 5 m.

1.5 Key Legislative Requirements

The legislation, policies and guidelines listed below in Table 1-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 1-1 A list of key legislative requirements

Region	Legislation / Guideline	Comment
National	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)	Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017 amended March 2022), Appendix 6 requirements
	The National Environmental Management: Biodiversity Act (Act No. 10 of 2004), Threatened or Protected Species Regulations	The protection of species and ecosystems that warrant protection
	National Forest Act (Act No. 84 of 1998)	
	Environmental Impact Assessment Regulations, 2014, as amended, and associated specialist assessment protocols and minimum report content requirements (GN 320 of 2020, GN 1150 of 2020, and GN 3717 of 2023)	The minimum criteria for reporting.
	Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, GNR 1150 of Government Gazette 43855 (October 2020)	Protocol for the specialist assessment and minimum report content requirements.
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);	The regulation of waste management to protect the environment.
	National Water Act (NWA) (Act No. 36 of 1998)	The regulation of water uses.
	Alien and Invasive Species Regulations and, Alien and Invasive Species List, published under NEMBA. GN 1020 of GG 43725 of 25 September 2020	The regulation and management of alien invasive species.

	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA)	To provide for control over the utilization of the natural agricultural resources including the vegetation and the combating of weeds and invader plants.
	Free State Nature Conservation Ordinance 8 of 1969	To provide for the management and conservation of the province's biophysical environment and protected areas.
Provincial	Free State Province Biodiversity Plan V1.0 of 2015	To inform land use planning, environmental assessments, land and water use authorisations, as well as natural resource management.
	Free State Biodiversity Plan CBA (DESTEA, 2015)	

2 Fieldwork

2.1 Biodiversity Field Assessment

One (1) wet and one (1) dry season field survey was undertaken for the project on the 16th to the 19th of March and 15th to 16th of July 2026, respectively, to confirm the presence of SCC, as well as any sensitive habitat features. The additional field survey was undertaken on the 15th to the 16th of July following a proposed layout alternation. Effort was made to cover all the different habitat types within the limits of time and access. During the survey, notes were made regarding current impacts, recording of dominant vegetation species and any sensitive or important features (e.g., drainage lines, rock outcrops, termite mounds etc.). Effort was made to cover all the different habitat types, within the limits of time and access (Figure 2-1)

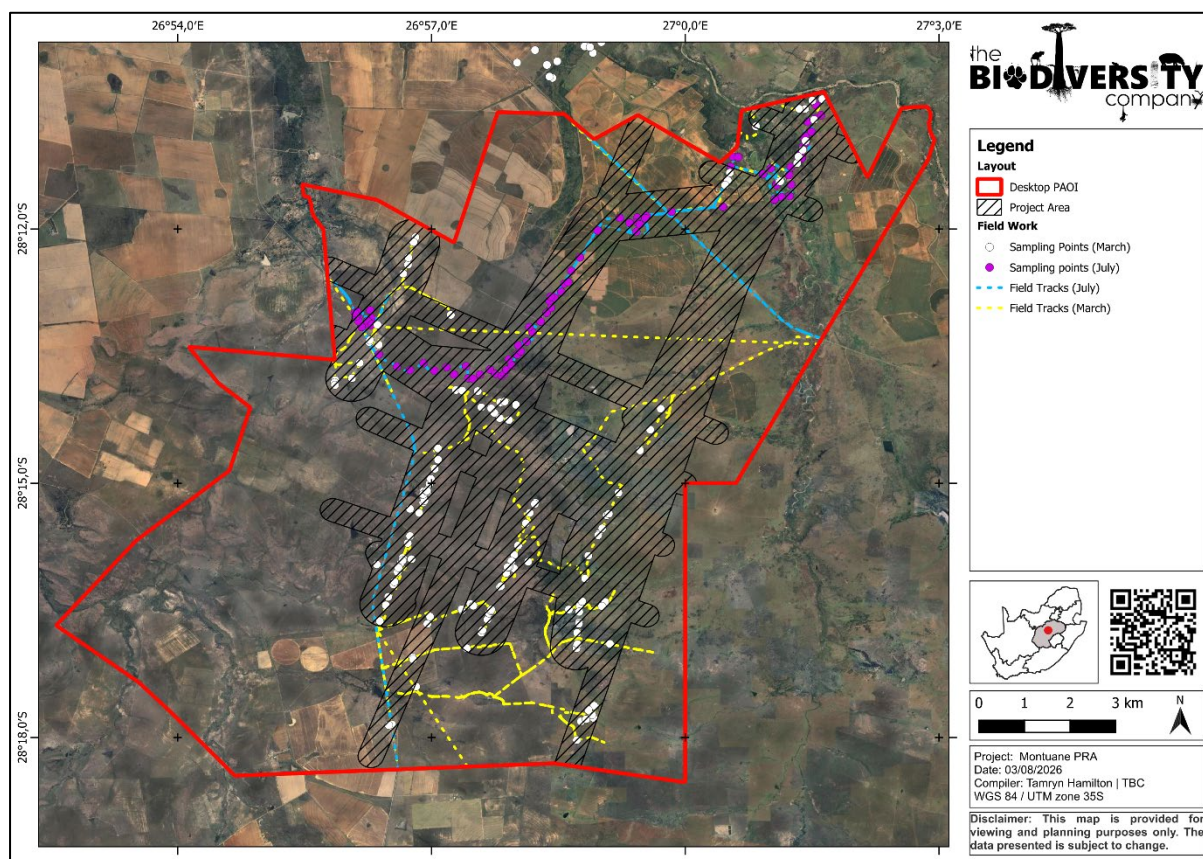


Figure 2-1 Map illustrating the field tracks of the field survey within the Project Area³.

³ The Seismic Transect (shown in light blue) were ground-truthed in the field. In contrast, the Desktop PAOI areas (shown in dark blue) were not ground-truthed and were assessed exclusively through desktop analysis.

3 Results & Discussion

3.1 Desktop Baseline

3.1.1 Ecologically Important Landscape Features

The relevance of the proposed development to ecologically important landscape features are summarised in Table 3-1.

Table 3-1 *Summary of relevance of the proposed project to ecologically important landscape features*

Desktop Considered	Information	Relevance	Reasoning	Section
Ecosystem Threat Status (Red List of Ecosystems (RLE, 2022; RLE, 2025))		Relevant	Desktop PAOI: Overlaps with 'Endangered' and 'Least Concern' ecosystems Project Area: Overlaps with 'Endangered' and 'Least Concern' ecosystems	3.1.1.1
Ecosystem Protection Level (NBA, 2018)		Relevant	Desktop PAOI: Overlaps with 'Not Protected', 'Poorly Protected' and 'Moderately Protected' Ecosystems Project Area: Overlaps with 'Not Protected', 'Poorly Protected' and 'Moderately Protected' Ecosystems	3.1.1.2
Provincial Conservation Plan (Free State Biodiversity Plan 2024)		Relevant	Desktop PAOI: Overlaps with CBA 1, CBA 2, ESA1, ESA 2, Other Natural Areas and Degraded Areas Project Area: Overlaps with CBA 1, CBA 2, ESA 1, ESA 2, Other Natural Areas and Degraded Areas	3.1.1.3
National Protected Areas Expansion Strategy (NPAES, 2018)		Relevant	Desktop PAOI: Overlaps with NPAES Priority Focus Areas Project Area: Overlaps with NPAES Priority Focus Areas	3.1.1.4
South Africa Protected Areas Database (SAPAD, 2025) and South Africa Conservation Areas Database (SACAD, 2025)		Relevant	Desktop PAOI: According to the protected area spatial datasets from SAPAD and SACAD, three SACADs occur within 10 km, Tara Wildlife Safaris, H.J. Joel Private Nature Reserve and LM Safaris Nature Reserve. No SAPADs occur within 5 km. Project Area: According to the protected area spatial datasets from SAPAD and SACAD, three SACADs occur within 10 km, Tara Wildlife Safaris, H.J. Joel Private Nature Reserve and LM Safaris Nature Reserve. No SAPADs occur within 5 km.	3.1.1.5
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)		Relevant	Desktop PAOI: A Depression Wetland can be found within both the Desktop PAOI and the 500 m regulated area, while a Seep Wetland can be found within the Desktop PAOI. Additionally, five rivers—Sand, Doring, Schoemanspruit, Merriespruit and Maselspruit—overlaps with the Desktop PAOI. Project Area: A Seep Wetland can be found within the Seismic Transect, while a Depression Wetland can be found within the 500 m regulated area. Additionally, three rivers—Sand, Merriespruit and Maselspruit—overlaps with the Seismic Transect.	3.1.1.6
National Ecosystem Freshwater Priority Area (NFEPA)		Relevant	Desktop PAOI: A variety of wetland types were identified within the Desktop PAOI through desktop analysis. These include a Channelled Valley-Bottom (CVB) Wetland, a Flat Wetland, and Unchannelled Valley-Bottom (UVB) Wetland, and a Floodplain Wetland, all located within the Desktop PAOI. Additionally, both a Depression Wetland and a Seep Wetland were identified within the Desktop PAOI as well as within the surrounding 500 m regulated area. Five rivers—Sand, Maselspruit, Merriespruit, Doring, and Schoemanspruit—overlap with the Desktop PAOI. Project Area: Several wetland types were identified within the Seismic Transect and the surrounding 500 m regulated area. A CVB Wetland, a Flat Wetland, a Floodplain Wetland, and a Seep Wetland are present within the Seismic Transect, with the CVB Wetland, Floodplain Wetland, and Seep Wetlands also extending into the 500 m regulated area. An UVB Wetland was identified within the 500 m regulated area. Additionally, three rivers—Sand, Maselspruit, and Merriespruit—overlap with the Seismic Transect.	3.1.1.7
Strategic Water Areas (SWSA)	Source	Irrelevant	Desktop PAOI: Does not overlap with any relevant areas Project Area: Does not overlap with any relevant areas	-
Key Biodiversity Areas (KBA, 2024)	Areas	Irrelevant	Desktop PAOI: Not within range of any relevant areas Project Area: Not within range of any relevant areas	-

3.1.1.1 Red List of Ecosystems

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the Red List of Ecosystems dataset (Skowno & Monyeke, 2021) the Desktop PAOI and Project Area overlaps with an EN and LC ecosystem (Figure 3-1 and Figure 3-2).

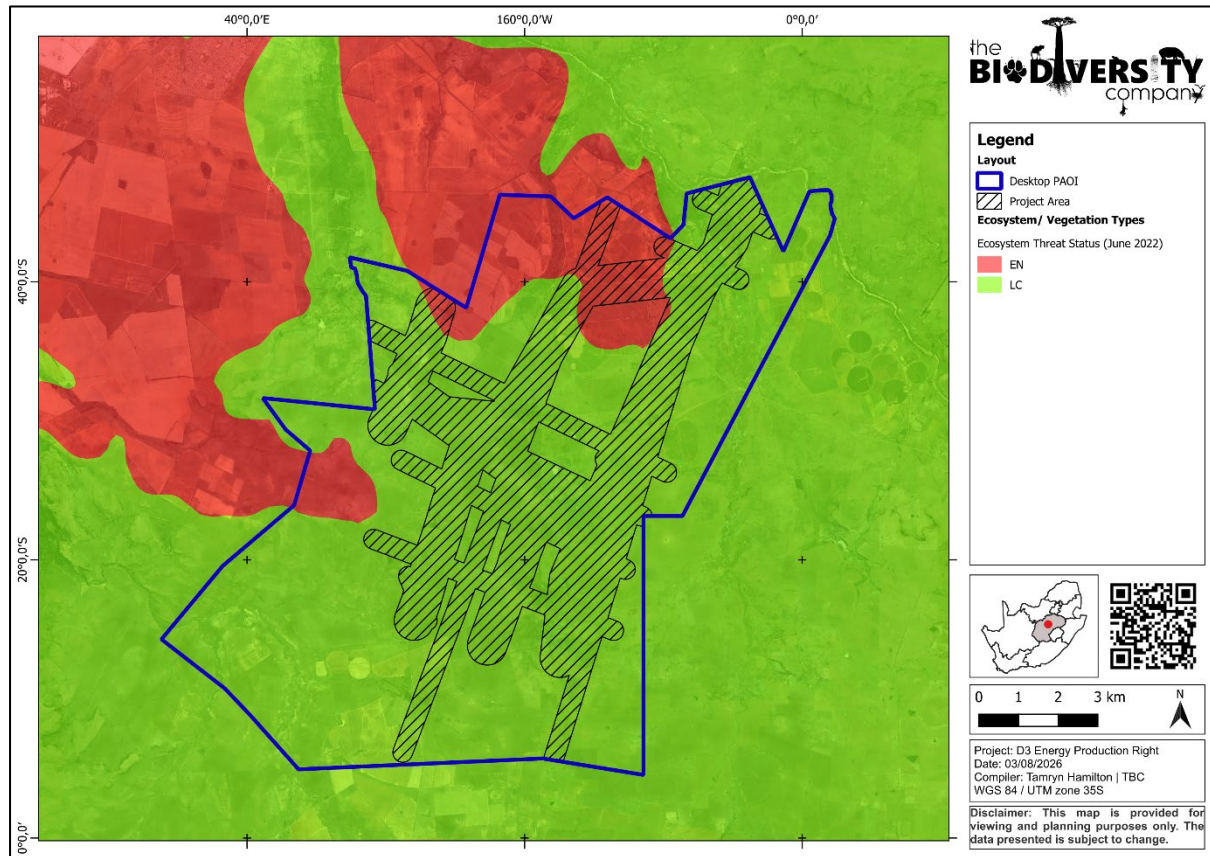


Figure 3-1 Map illustrating the ecosystem threat status associated with the Desktop PAOI and Project Area (NBA, 2022)

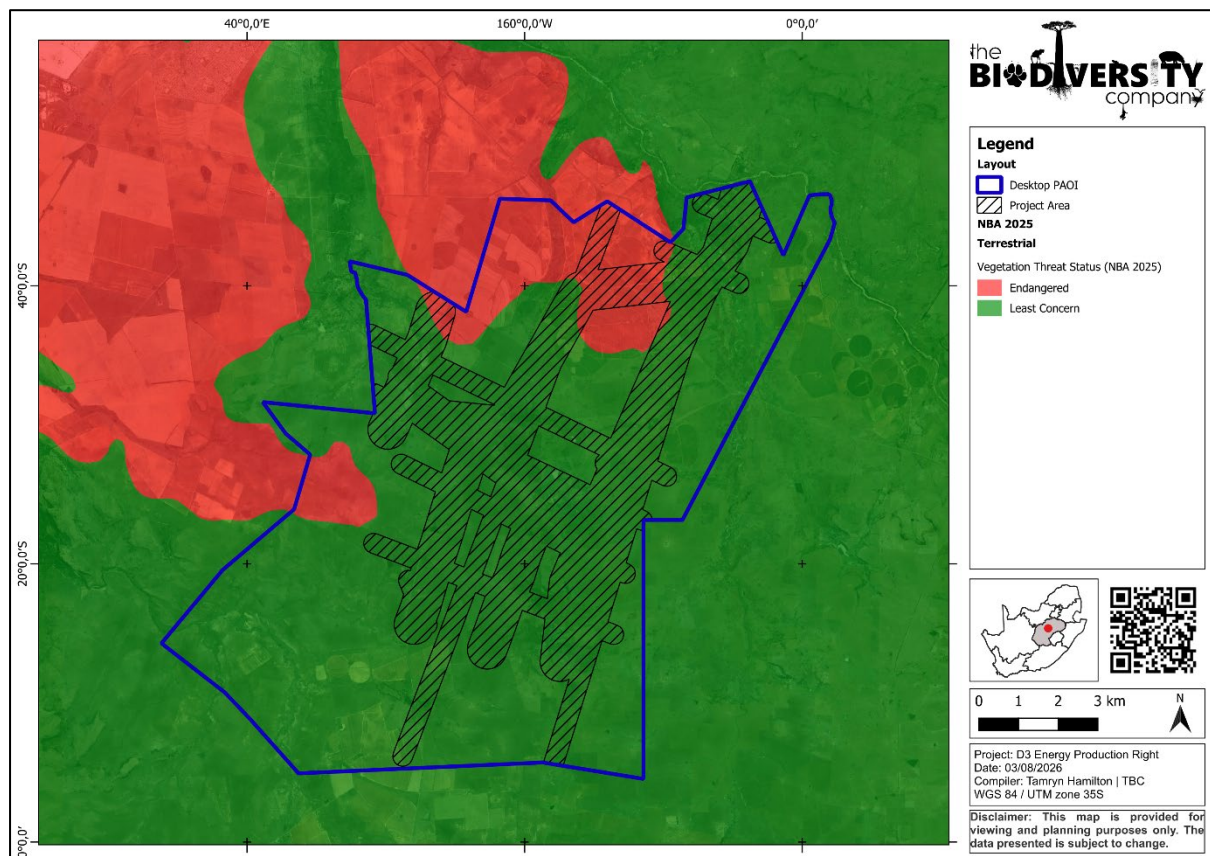


Figure 3-2 Map illustrating the ecosystem threat status associated with the Desktop PAOI and Project Area (NBA, 2025)

3.1.1.2 Ecosystem Protection Level

Ecosystem Protection Level (EPL) is an indicator of the extent to which ecosystem types are represented within South Africa's protected area network relative to ecosystem-specific conservation targets. In NBA 2025, terrestrial ecosystem types were classified as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP) or Not Protected (NP), according to the proportion of the ecosystem target achieved within the protected area network. A total of 463 terrestrial ecosystem types were assessed, of which 121 (26.1%) are Well Protected, 67 (14.5%) are Moderately Protected, 163 (35.2%) are Poorly Protected, and 112 (24.2%) are Not Protected. At the start of 2025, approximately 9.9% of South Africa's landmass was formally protected (Skowno, Monyeki & Khatieb, 2026). The Desktop PAOI and Project Area overlaps with a MP, NP and PP ecosystem (Figure 3-3 and Figure 3-4).

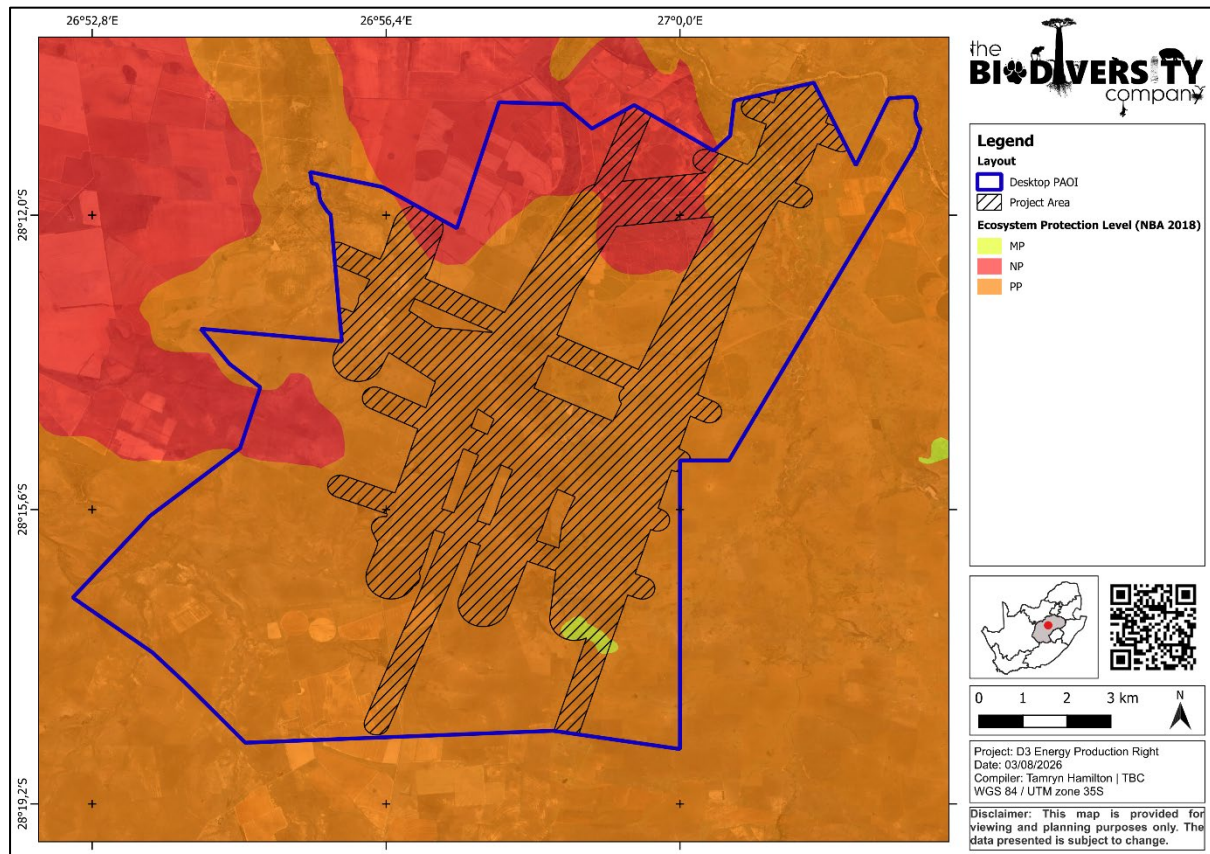


Figure 3-3 Map illustrating the ecosystem protection level associated with the Desktop PAOI and Project Area (NBA, 2022)

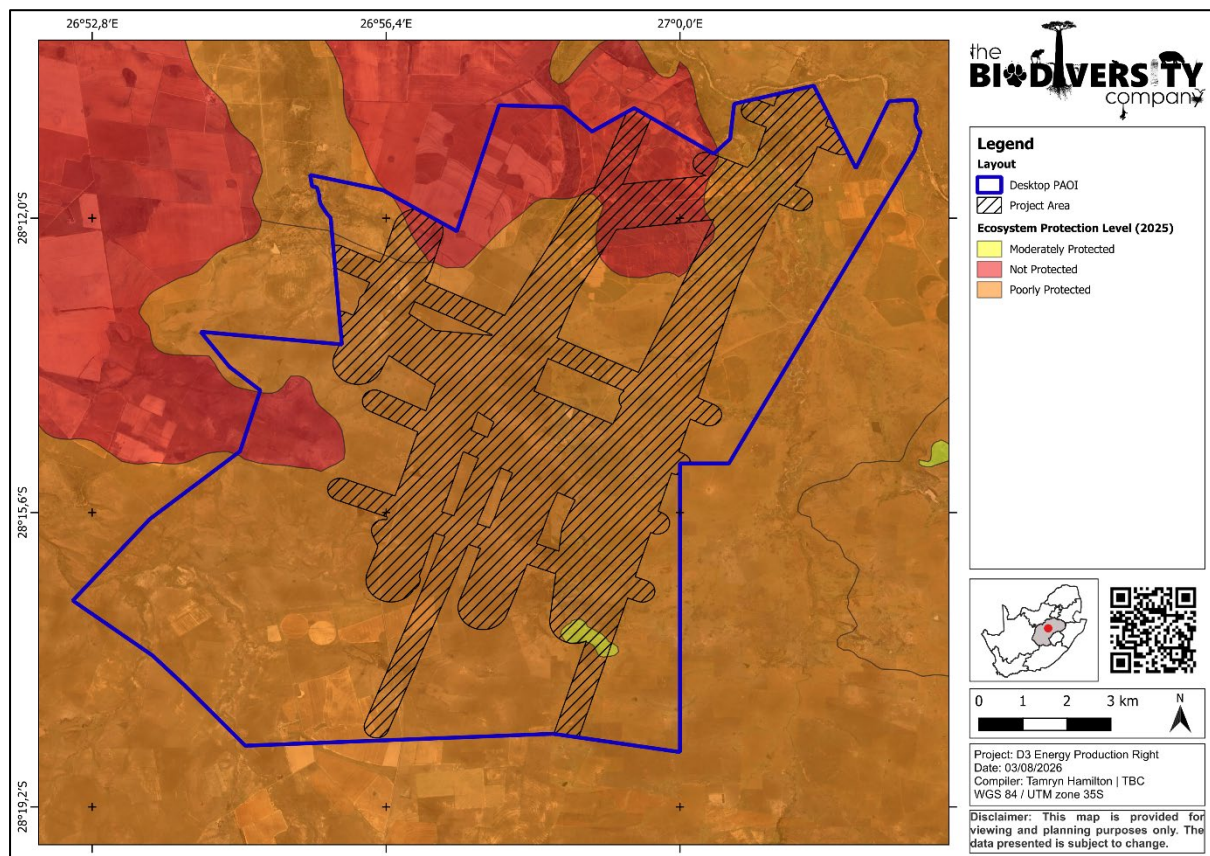


Figure 3-4 Map illustrating the ecosystem protection level associated with the Desktop PAOI and Project Area (NBA, 2025)

3.1.1.3 Provincial Conservation Plan

The Free State Department of Environment and Nature Conservation has developed the CBA Map which identifies biodiversity priority areas for the province, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These biodiversity priority areas, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape. The identification of Critical Biodiversity Areas was undertaken using a Systematic Conservation Planning approach. Available data on biodiversity features (incorporating both pattern and process, and covering terrestrial and inland aquatic realms), their condition, current Protected Areas and Conservation Areas, and opportunities and constraints for effective conservation were collated. The Critical Biodiversity Area (CBA) Map updates, revises and replaces all older systematic biodiversity plans and associated products for the province. According to the Free State conservation plan the Desktop PAOI and Project Area overlaps with CBA 1, CBA 2, ESA 1, ESA 2, Other Natural Areas and Degraded Areas (Figure 3-5).

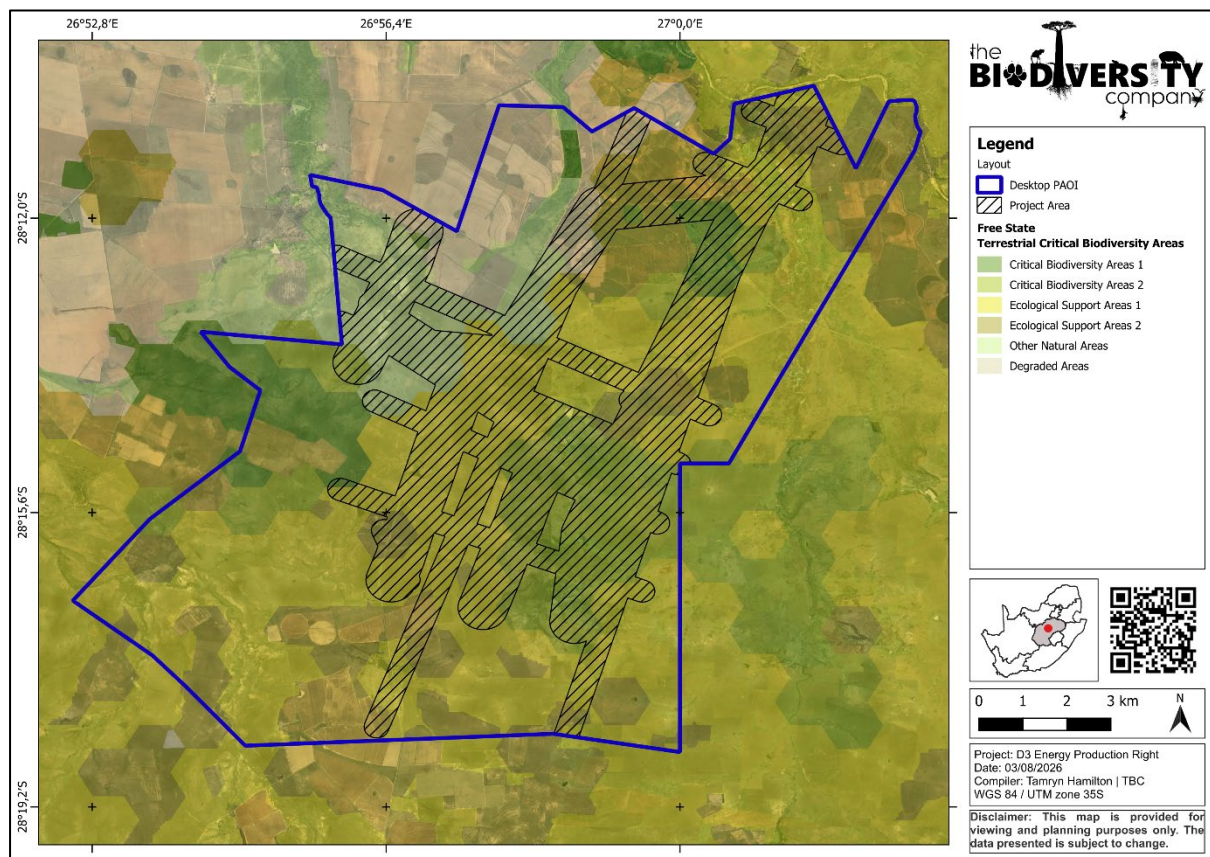


Figure 3-5 Map illustrating the Desktop PAOI and Project Area in relation to the Free State Terrestrial CBA Plan

3.1.1.4 National Protected Areas Expansion Strategy (NPAES)

The Department of Environmental Affairs (now the Department of Forestry, Fisheries and the Environment) led the development of the National Protected Areas Expansion Strategy (NPAES) in consultation with the protected area agencies and other key private and public sector stakeholders. The need for the development of the NPAES was established in the National Biodiversity Framework in 2009 (DFFE, 2022b).

South Africa's protected area network currently falls far short of representing all ecosystems and maintaining healthy functioning ecological processes. In this context, the goal of the NPAES is to achieve cost effective protected area expansion, thus enabling better ecosystem representation, ecological sustainability, and resilience to climate change. A comprehensive set of priority areas was compiled based on the priorities identified by provincial and other agencies in their respective protected area expansion strategies. These focus areas are generally large, intact and unfragmented and are, therefore, of high importance for biodiversity, climate resilience and freshwater protection (DFFE, 2022b). The Desktop PAOI and Project Area does overlap with NPAES (Figure 3-6). As can be seen in Figure 3-6, majority of the Project Area overlaps with NPAES.

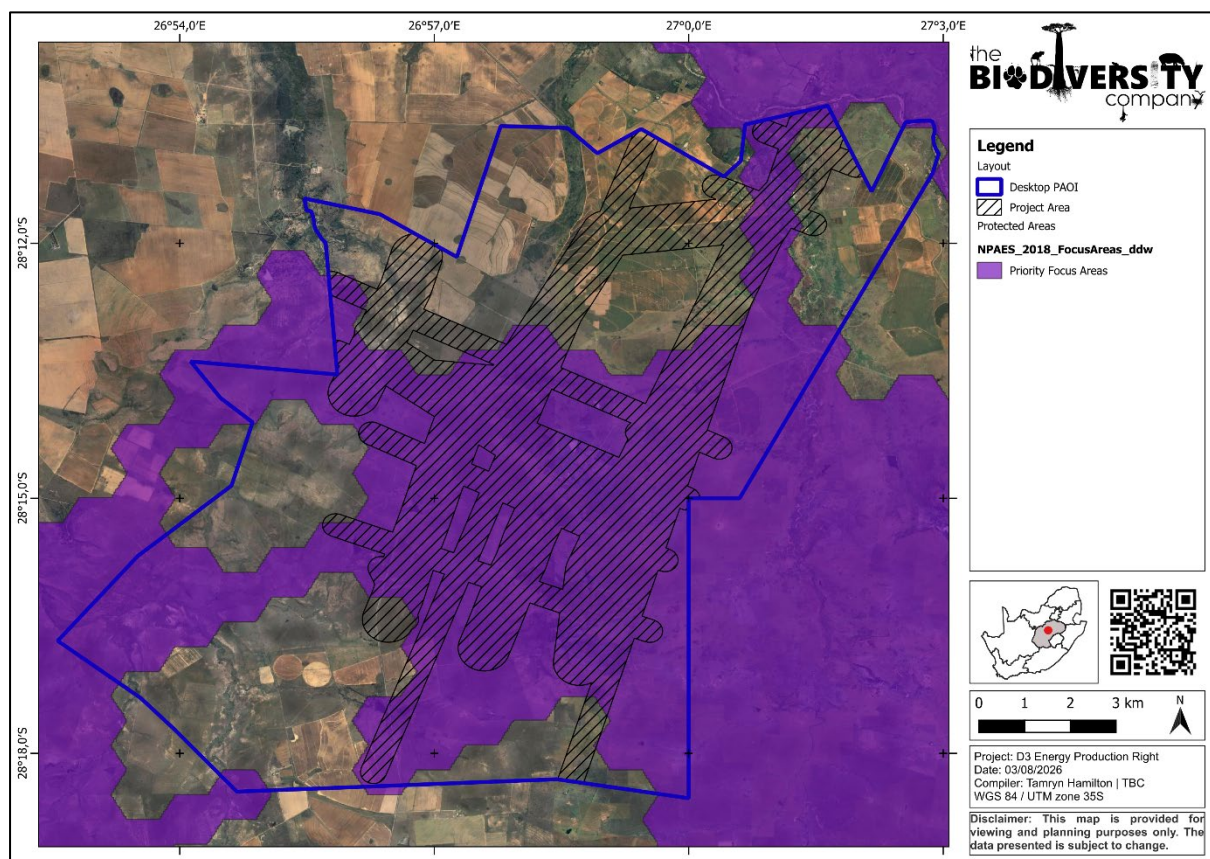


Figure 3-6 Map illustrating the NPAES focus areas and their proximity to the Desktop PAOI and Project Area

3.1.1.5 Protected Areas

According to the protected area spatial datasets from SAPAD (2025) and SACAD (2025) for the Desktop PAOI and Project Area, three SACADs occur within 10 km, namely Tara Wildlife Safaris, H.J. Joel Private Nature Reserve and LM Safaris (Figure 3-7). No SAPADs occur within 5km. However, it is important to note that there are no SAPAD nor SACAD areas overlapping with the Desktop PAOI or Project Area area as can be seen in Figure 3-7.

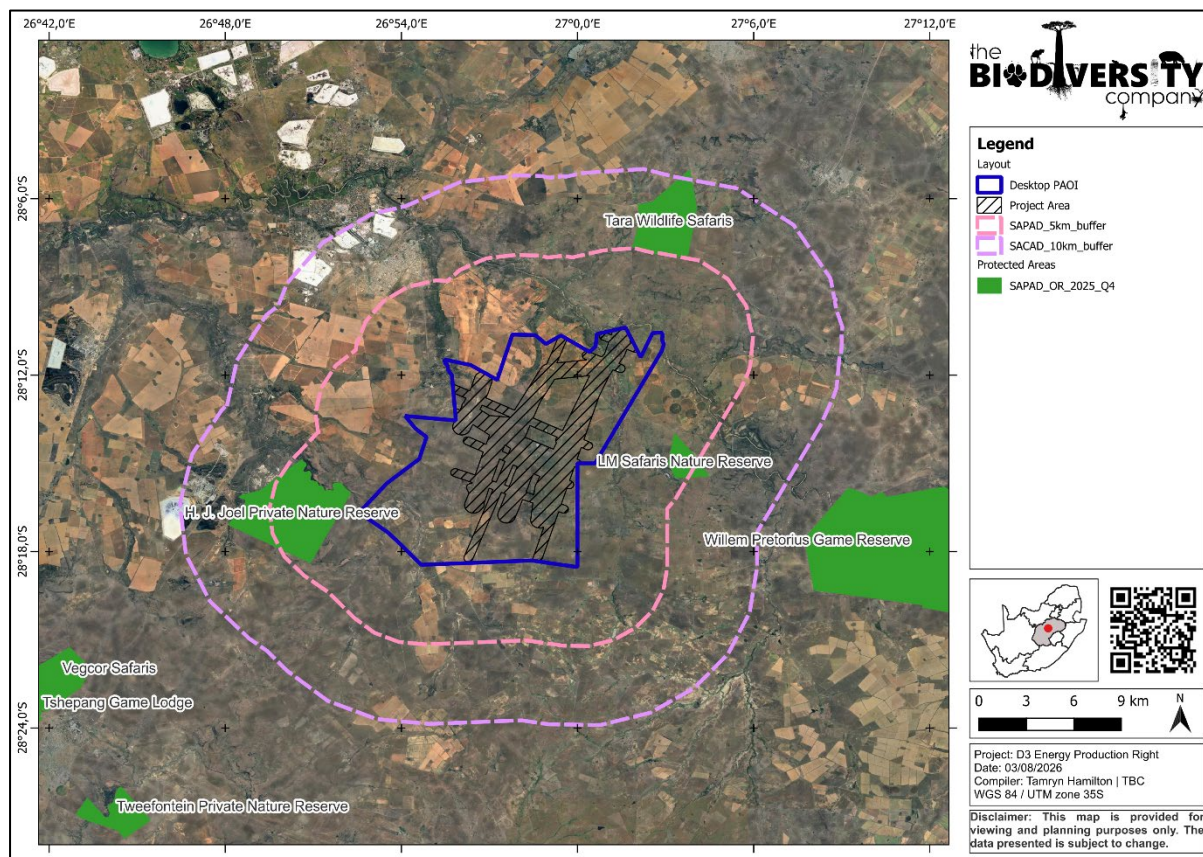


Figure 3-7 Map illustrating the location of the Protected Areas proximal to the Desktop PAOI and Project Area

3.1.1.6 South African Inventory of Inland Aquatic Ecosystems

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA in 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019).

Several wetland and river features were identified within the Desktop PAOI and along the Project Area through desktop analysis. Within the Desktop PAOI, a Depression Wetland was identified, occurring both within the Desktop PAOI itself and the surrounding 500 m regulated area. In addition, a Seep Wetland is present within the Desktop PAOI. The Desktop PAOI overlaps with five rivers: the Sand, Doring, Schoemanspruit, Merriespruit and Maselspruit.

Along the Seismic Transect, a Seep Wetland was identified within the transect, while a Depression Wetland occurs within the adjacent 500 m regulated area. The Project Area overlaps with three rivers: the Sand, Merriespruit and Maselspruit.

With regard to conservation status, the Depression Wetland is currently classified as “Not Protected,” while the Seep Wetland is considered “Poorly Protected.” The Sand and Maselspruit rivers have not yet been assessed in terms of their protection status (Figure 3-8).

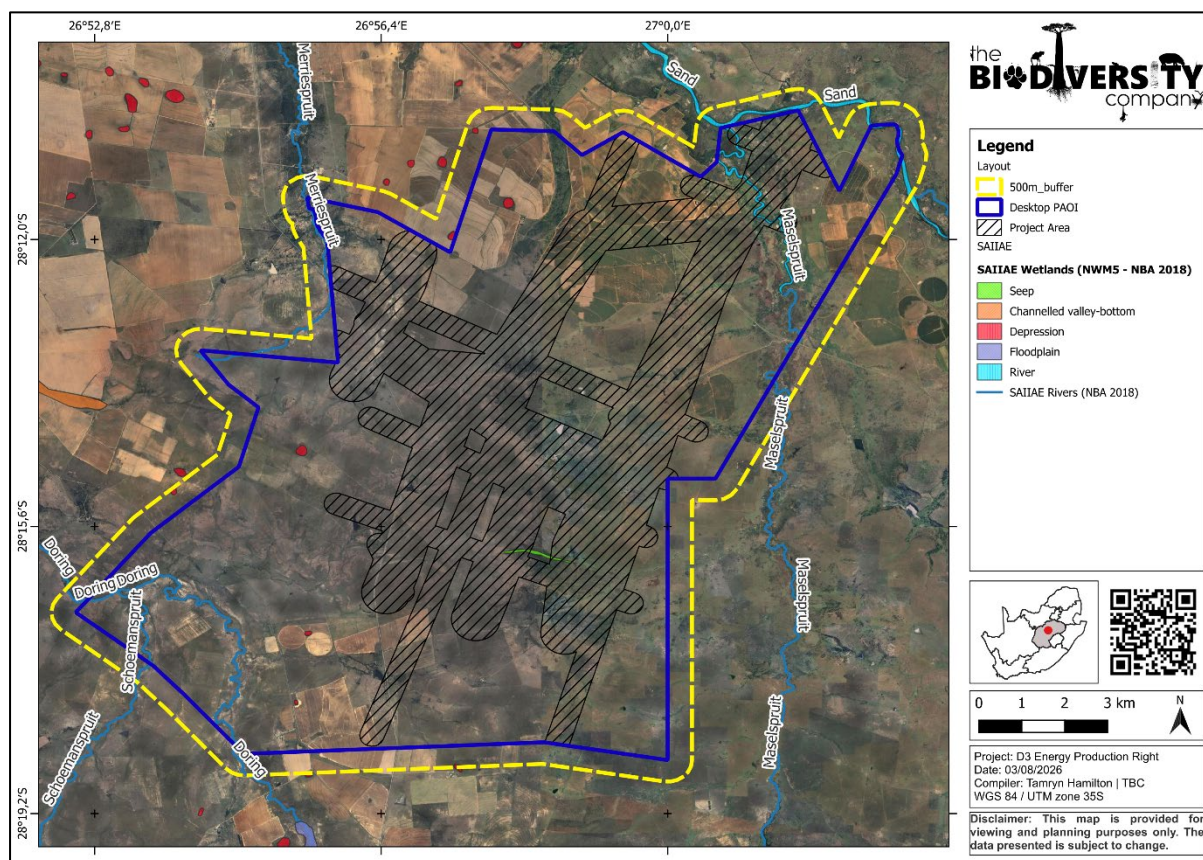


Figure 3-8 Map illustrating the Desktop PAOI and Project Area in relation to the South African Inventory of Inland Aquatic Ecosystems dataset

3.1.1.7 National Freshwater Ecosystem Priority Area Status

In an attempt to better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al.*, 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al.*, 2011). A range of wetland types were identified within the Desktop PAOI and Project Area through desktop analysis. Within the Desktop PAOI, Channelled Valley-Bottom, Flat, Unchannelled Valley-Bottom, and Floodplain Wetlands were recorded. Both Depression and Seep Wetlands were also identified within the Desktop PAOI and extend into the surrounding 500 m regulated area. Five rivers overlap with the Desktop PAOI: the Sand, Maselspruit, Merriespruit, Doring and Schoemanspruit. Similarly, several wetland types were identified along the Seismic Transect and within the adjacent 500 m regulated area. These include Channelled Valley-Bottom, Flat, Floodplain, and Seep Wetlands within the Seismic Transect, with the Channelled Valley-Bottom, Floodplain, and Seep Wetlands also present in the 500 m regulated area. An Unchannelled Valley-Bottom Wetland was identified within the 500 m regulated area. Three rivers overlap with the Project Area: the Sand, Maselspruit and Merriespruit.

All identified Channelled Valley-Bottom, Flat, Floodplain, Seep, and Unchannelled Valley-Bottom Wetlands, as well as the Sand River, are classified as “Non-Priority” ecosystems. This indicates that,



This section is divided into a description of the vegetation type expected under natural conditions and the expected flora species.

The Desktop PAOI and Project Area are situated within the Grassland Biome, which spans approximately one third of South Africa's land surface. This biome extends from the Eastern Cape and KwaZulu-Natal, across the high escarpment, and onto the central plateau (SANBI, 2013). Renowned for its high biodiversity, the Grassland Biome provides critical habitat for numerous rare, endangered, and endemic animal and plant species. In terms of plant diversity, it is second only to the fynbos biome. The rich biodiversity of the grasslands supports a variety of ecosystem services that are essential for many of South Africa's key economic activities and sustain millions of rural livelihoods (SANBI, 2013).

According to National Vegetation Map (NVM, 2024) the Desktop PAOI and Project Area are situated in the Bloemfontein Karroid Shrubland, Central Free State Grassland, Highveld Alluvial Vegetation and Vaal-Vet Sandy Grassland vegetation types (Figure 3-10). While Bloemfontein Karroid Shrubland,

Central Free State Grassland, and Vaal-Vet Sandy Grassland are all part of the Dry Highveld Grassland Biome, Highveld Alluvial Vegetation belongs to the Alluvial Vegetation group.

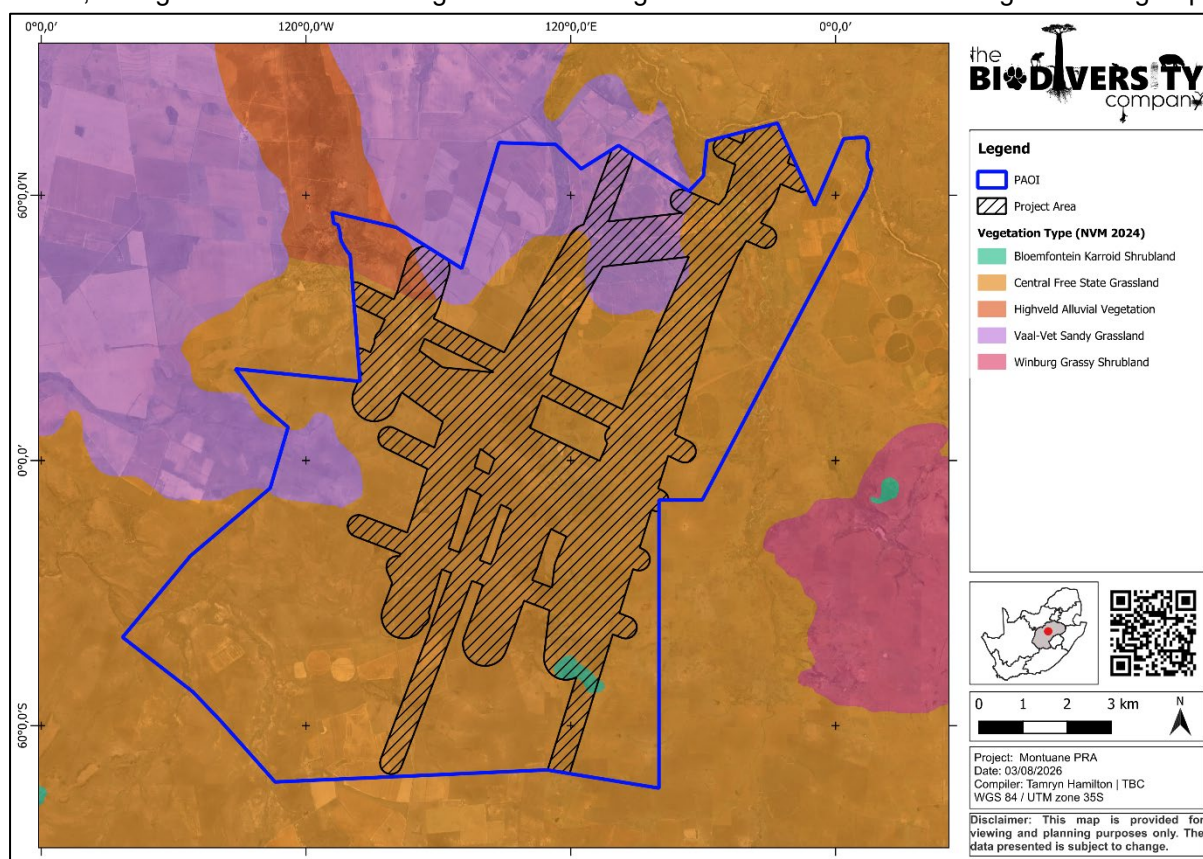


Figure 3-10 Map illustrating the vegetation types associated with the PAOI

3.1.2.1.1 Vaal-Vet Sandy Grassland

The Vaal-Vet Sandy Grassland is found in the North-West and Free State Provinces, stretching south from Lichtenburg and Ventersdorp through Klerksdorp, Leeudoringstad, Bothaville, and down to the Brandfort area north of Bloemfontein. Most of this unit lies between 1,260 and 1,360 meters in altitude. The landscape is dominated by plains, with some gently undulating hills, supporting low-tussock grasslands rich in karroid species. *Themeda triandra* is the characteristic grass, though its local decline—often replaced by *Elionurus muticus*, *Cymbopogon pospischilii*, and *Aristida congesta*—is linked to heavy grazing or irregular rainfall. Soils are mainly sandy, derived from aeolian and colluvial deposits overlying Karoo Supergroup rocks, with Avalon, Westleigh, and Clovelly as typical soil forms. The climate is warm-temperate with summer rainfall averaging 530 mm, high summer temperatures, and severe winter frost.

Important Plant Taxa

Graminoids: *Antheophora 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*.

Conservation Status of the Vegetation Type

The Vaal-Vet Sandy Grassland is classified as Endangered (RLE, 2022), with a national conservation target of 24%. A small extent is conserved in statutory areas such as the Bloemhof Dam, Schoonspruit, Sandveld, Faan Meintjies, Wolvespruit and Soetdoring Nature Reserves. More than 63% of this vegetation type has been transformed due to strong grazing pressure from sheep and cattle as well as cultivation (Mucina & Rutherford, 2006).

3.1.2.1.2 Central Free State Grassland

The Central Free State Grassland spans a broad zone in the Free State Province, extending marginally into Gauteng, from Sasolburg in the north to Dewetsdorp in the south, and includes towns such as Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley, and Edenville. Most of this grassland occurs between 1,400 and 1,460 meters above sea level. The landscape features undulating plains with short grassland, naturally dominated by *Themeda triandra*, while *Eragrostis curvula* and *E. chloromelas* become prevalent in disturbed areas. Severely degraded clayey bottomlands may support dwarf karoo bushes, and overgrazed low-lying areas are susceptible to *Vachellia karroo* encroachment. Soils are derived mainly from sedimentary mudstones and sandstones of the Adelaide and Ecca Groups, resulting in vertic, melanic, and red soils typical of the Dc land type. The region experiences summer rainfall averaging 560 mm, with most precipitation falling in December and January, and has a mean annual temperature of 15°C and frequent frost.

Important Plant Taxa

Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *Cynodon dactylon* (d), *Eragrostis chloromelas* (d), *E. curvula* (d), *E. plana* (d), *Panicum coloratum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Agrostis lachnantha*, *Andropogon appendiculatus*, *Aristida bipartita*, *A. canescens*, *Cymbopogon pospischilii*, *Cynodon transvaalensis*, *Digitaria argyrograpta*, *Elionurus muticus*, *Eragrostis lehmanniana*, *E. micrantha*, *E. obtusa*, *E. racemosa*, *E. trichophora*, *Heteropogon contortus*, *Microchloa caffra*, *Setaria incrassata*, *Sporobolus discosporus*.

Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Conyza pinnata*, *Crabbea acaulis*, *Geigeria aspera* var. *aspera*, *Hermannia depressa*, *Hibiscus pusillus*, *Pseudognaphalium luteo-album*, *Salvia stenophylla*, *Selago densiflora*, *Sonchus dregeanus*.

Geophytic Herbs: *Oxalis depressa*, *Raphionacme dyeri*.

Succulent Herb: *Tripteris aghillana* var. *integrifolia*.

Low Shrubs: *Felicia muricata* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *Melolobium candicans*, *Pentzia globosa*.

Conservation Status of the Vegetation Type

The Central Free State Grassland is classified as Least Concern (RLE, 2022), with a national conservation target of 24%. A small extent is conserved in statutory areas such as the Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves as well as some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by building of dams

(Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede). No serious infestation by alien flora has been observed, but encroachment of dwarf karoo shrubs becomes a problem in the degraded southern parts of this vegetation unit (Mucina & Rutherford, 2006).

3.1.2.1.3 Highveld Alluvial Vegetation

Highveld Alluvial Vegetation occurs along alluvial drainage lines and floodplains of major rivers and their tributaries across the Free State, North-West, Mpumalanga, and Gauteng Provinces, as well as in Lesotho and Eswatini. These systems are typically found at altitudes between 1,000 and 1,500 meters. The landscape is characterised by flat terrain supporting riparian thickets dominated by *Vachellia karroo*, with seasonally flooded grasslands and disturbed herblands—often featuring alien species—also present. Soils are deep, ranging from coarse sand to clay, developed over Quaternary alluvial sediments, with Oakleaf, Dundee, Shortlands, Glenrosa, and Mispah soil forms common in floodplains such as those of the Vaal River. Perennial rivers frequently flood in summer, causing bank erosion and deposition of new alluvium, while some smaller channels may dry out in winter. The climate is seasonal with mainly summer rainfall, ranging from 300–400 mm in the west to up to 600 mm in the east and north, and an overall mean annual precipitation of about 500 mm. Summers are hot and often subtropical, while winters are cold with frequent frost.

Important Plant Taxa

Small Trees: *Vachellia karroo* (d), *Salix mucronata* subsp. *mucronata* (d), *S. mucronata* subsp. *woodii* (d, within subescarpment grasslands of KwaZulu-Natal), *Ziziphus mucronata* (d), *Celtis africana*, *Searsia lancea*.

Tall Shrubs: *Gymnosporia buxifolia* (d), *Searsia pyroides* (d), *Diospyros lycioides*, *Ehretia rigida*, *Grewia flava*. **Low Shrubs:** *Asparagus laricinus* (d), *A. suaveolens* (d).

Woody Climber: *Clematis brachiata*.

Succulent Shrub: *Lycium hirsutum* (d). **Graminoids:** *Setaria verticillata* (d), *Panicum maximum*.

Herb: *Pollichia campestris*.

Reed beds: *Phragmites australis* (d).

Low Shrubs: *Gomphocarpus fruticosus* (d), *Felicia muricata*. **Succulent Shrub:** *Salsola rabieana*.

Graminoids: *Agrostis lachnantha* (d), *Andropogon eucomus* (d), *Chloris virgata* (d), *Cynodon dactylon* (d), *Eragrostis plana* (d), *Hemarthria altissima* (d), *Imperata cylindrica* (d), *Ischaemum fasciculatum* (d), *Miscanthus junceus* (d), *Paspalum distichum* (d), *Andropogon appendiculatus*, *Brachiaria marlothii*, *Cyperus denudatus*, *C. longus*, *Echinochloa holubii*, *Eragrostis obtusa*, *E. porosa*, *Fimbristylis ferruginea*, *Panicum coloratum*, *Pycnus mundii*, *Sporobolus africanus*, *S. fimbriatus*, *Themeda triandra*, *Urochloa panicoides*.

Herbs: *Persicaria lapathifolia* (d), *Alternanthera sessilis*, *Barleria macrostegia*, *Corchorus asplenifolius*, *Equisetum ramosissimum*, *Galium capense*, *Hibiscus pusillus*, *Lobelia angolensis*, *Nidorella resedifolia*, *Persicaria amphibia*, *P. hystricula*, *Pseudognaphalium oligandrum*, *Pulicaria scabra*, *Rorippa fluvialilis* var. *fluvialilis*, *Senecio inornatus*, *Stachys hyssopoides*, *Vahlia capensis*.

Geophytic Herbs: *Crinum bulbispermum*, *Haplocarpha lyrata*.

Conservation Status of the Vegetation Type

The Highveld Alluvial Vegetation is of Least Concern (RLE, 2022), with a national conservation target of 31%. Nearly 10% is statutorily conserved in the Barberspan (a Ramsar site), Bloemhof Dam, Christiana, Faan Meintjes, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves.

More than a quarter has been transformed for cultivation and by building of dams (Bloemhof, Erfenis, Krugersdrif, Mockes and Vaalharts Dams).

3.1.2.1.4 Bloemfontein Karroid Shrubland

The Bloemfontein Karroid Shrubland occurs as scattered patches on koppies and ridges within the Free State and southwestern Mpumalanga, stretching from Bloemfontein through Verkeerdevlei, Lindley, Standerton, Heilbron, and Bultfontein. Most of these shrublands are found at altitudes between 1,400 and 1,440 meters. The landscape is characterised by low, succulent-dominated shrubland on dolerite outcrops, with grasses limited to soil-filled crevices and an abundance of geophytic herbs. Solitary shrubs such as *Diospyros austro-africana* and *Euclea crispa* subsp. *ovata* are occasionally present. The soils are shallow, sandy layers overlying Jurassic dolerite, and the area experiences summer rainfall averaging around 570 mm, with cold winters and frequent frost. (Mucina & Rutherford, 2006).

Important Plant Taxa

Graminoids: *Aristida diffusa* (d), *Eragrostis nindensis* (d), *Heteropogon contortus* (d), *Oropetium capense* (d), *Aristida adscensionis*, *A. congesta*, *Cymbopogon caesius*, *C. pospischilii*, *Cyperus rupestris* var. *rupestris*, *Digitaria eriantha*, *Enneapogon scoparius*, *Eragrostis chloromelas*, *E. obtusa*, *E. superba*, *E. trichophora*, *Eustachys paspaloides*, *Melinis repens* subsp. *repens*, *Microchloa caffra*, *Themeda triandra*, *Tragus koelerioides*, *T. racemosus*.

Low Shrubs: *Eriocephalus ericoides* (d), *Euryops empetrifolius* (d), *Anthospermum rigidum* subsp. *pumilum*, *Asparagus suaveolens*, *Felicia muricata*, *Helichrysum dregeanum*, *Heliophila suavissima*, *Jamesbrittenia pristisepala*, *Nenax microphylla*, *Pentzia globosa*, *Phyllanthus parvulus*, *Selago albida*.
Succulent Shrubs: *Chasmatophyllum musculinum* (d), *Euphorbia mauritanica* (d), *Ruschia spinosa* (d), *Stomatium mustellinum* (d), *Cotyledon orbiculata* var. *dactyloopsis*, *Euphorbia rectirama*, *Kalanchoe paniculata*, *Othonna protecta*, *Pachypodium succulentum*, *Ruschia hamata*, *R. unidens*, *Sarcocaulon salmoniflorum*, *Stapelia grandiflora*.

Tall Shrubs: *Diospyros austro-africana*, *Euclea crispa* subsp. *ovata*, *Rhus burchellii*, *R. erosa*, *R. tridactyla*.

Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *B. rigida*, *Chamaesyce inaequilatera*, *Commelina africana*, *Gazania linearis* var. *linearis*, *Geigeria aspera* var. *aspera*, *G. filifolia*, *Hermannia coccocarpa*.

Geophytic Herbs: *Cheilanthes eckloniana* (d), *Albuca setosa*, *Dipcadi ciliare*, *D. viride*, *Nerine laticoma*, *Pellaea calomelanos*, *Trachyandra saltii*.

Succulent Herbs: *Senecio radicans* (d), *Adromischus trigynus*, *Aloe grandidentata*, *Anacampseros telephiastrum*, *Avonia ustulata*, *Crassula nudicaulis*, *Duvalia corderoyi*, *Orbea cooperi*, *Orbeopsis lutea*, *Tripteris aghillana* var. *integrifolia*.

Succulent Woody Climber: *Sarcostemma viminale*.

Endemic Taxon Geophytic Herb: *Brachystelma glenense*.

Conservation Status of the Vegetation Type

The Bloemfontein Karroid Shrubland is classified as Least Concern (RLE, 2022), with a national conservation target of 28%. None is conserved in statutory areas however, small patches are found within the Free State National Botanical Garden in Bloemfontein. Around 10% of this vegetation type has been transformed due to cultivation (Mucina & Rutherford, 2006).

3.1.2.2 Expected Flora Species

The iNaturalist database indicates that 243 species of plants are expected to occur within the Desktop PAOI, of which 215 are indigenous (Full list in Appendix C). The iNaturalist database does not indicate

the likely presence of any SCC, similarly, the DFFE National Environmental Screening Tool does not list any flora SCC.

3.1.3 Fauna Assessment

3.1.3.1 Sensitive Species

DFFE National Environmental Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number/sensitive animal unique number. As per the best practise guideline that accompanies the protocol and DFFE National Environmental Screening Tool, **the name of the sensitive species may not appear in the final EIA report nor any of the specialist reports released into the public domain.** It should be referred to as *sensitive plant* or *sensitive animal* and its threat status may be included, e.g. *critically endangered sensitive plant* or *endangered sensitive animal*.

Two (2) SCC animal species was listed by the DFFE screening tool and can be seen presented in Table 3-2.

Table 3-2 *List of Sensitive Species of Conservation Concern that may occur in the Desktop PAOI and Project Area. (VU = Vulnerable, LC = Least Concern and NT = Near Threatened).*

Scientific Name	Common Name	DFFE Screening Tool Designation	Conservation Status		Likelihood of Occurrence	Reason
			Regional	Global		
Avifauna						
<i>Hydroprogne caspia</i>	Caspian Tern	Medium	VU	LC	Low	Limited suitable habitat
Mammal						
<i>Hydricitis maculicollis</i>	Spotted-Neck Otter	Medium	VU	NT	Medium	Limited suitable habitat; presence of disturbance

3.1.3.2 Mammals

The iNaturalist database lists eleven (11) mammal species that could be expected to occur within the area (Full list in Appendix C). Excluding large mammal species that are normally restricted to protected areas, one (1) SCC is likely to occur in the Desktop PAOI and Project Area. One (1) additional species (two in total) is listed as sensitive according to the DFFE screening tool (Table 3-3).

Table 3-3 *Threatened mammal species that are expected to occur within the Desktop PAOI and Project Area (NT = Near threatened; VU = Vulnerable).*

Scientific Name	Common Name	Regional	Global	DFFE Screening Tool Sensitivity	Likelihood of Occurrence	Reason
<i>Aonyx capensis</i>	Cape clawless otter	NT	NT	-	Medium	Suitable habitat and distribution; adaptable species
<i>Hydricitis maculicollis</i>	Spotted-necked Otter	VU	NT	Medium	Medium	Limited suitable habitat; presence of disturbance

Aonyx capensis (Cape clawless otter) are predominantly aquatic and seldom found far from water. Freshwater is an essential habitat requirement, and they only occur in marine habitats where there is access to fresh water (IUCN, 2017). Based on the Red List of Mammals of South Africa, Lesotho and Swaziland (2016), *A. capensis* populations are decreasing due to the threats of habitat loss, domestic and urban wastewater pollution as well as illegal hunting. Although the species is cryptic and therefore not often seen, there is suitable habitat in the PAOI and therefore the likelihood of occurrence is rated as medium.

Hydriectis maculicollis (Spotted-necked Otter) inhabits freshwater habitats where water is un-silted, unpolluted, and rich in small to medium sized fishes (IUCN, 2017). Suitable habitat may be available in river and wetland areas within the PAOI; however, these resources have likely been modified to some extent, resulting in a moderate likelihood of occurrence.

3.1.3.3 Herpetofauna

Based on the iNaturalist database, fourteen (14) reptile species are expected to occur within the area, none of which are classified as SCC (Full list in Appendix C).

Based on the iNaturalist database five (5) amphibian species have the potential to occur in the Desktop PAOI and Project Area (Full list in Appendix C). One (1) of the expected species is an SCC. No additional amphibian SCC were listed by the DFFE screening tool.

Table 3-4 *Threatened amphibian SCC that are expected to occur within the Desktop PAOI and Project Area. (LC = Least Concern and NT = Near Threatened).*

Scientific Name	Common Name	Regional	Global	DFFE Screening Tool Sensitivity	Likelihood of Occurrence	Reason
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	LC	LC	-	Moderate	Suitable habitat may occur on site, and it is an adaptable species

3.1.3.4 Avifauna

SABAP2 data indicate that 286 avifauna species are expected for the Desktop PAOI, Project Area and surrounding areas (Full list in Appendix C). Of these 286 avifauna species, 37 are considered SCC (Table 3-5). The likelihood of occurrence within the Desktop PAOI and Project Area are included here. The DFFE screening tool lists three (3) high sensitivity species and one (1) medium sensitivity species. Some of the species are discussed in below.

Table 3-5 *Threatened avifauna species that are expected to occur within the Desktop PAOI and Project Area (LoO=Likelihood of occurrence LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)*

Common Name	Scientific Name	Regional	Global	DFFE Screening Tool	LoO
African Darter*	<i>Anhinga rufa</i>	NT	LC		High
African Marsh Harrier*	<i>Circus ranivorus</i>	VU	LC		Moderate
Black Stork*	<i>Ciconia nigra</i>	EN	LC		Low
Black-crowned Night Heron*	<i>Nycticorax nycticorax</i>	NT	LC		High
Black-winged Kite*	<i>Elanus caeruleus</i>	NT	LC		High
Black-winged Pratincole	<i>Glareola nordmanni</i>	LC	NT		Moderate
Blue Korhaan*	<i>Eupodotis caerulea</i>	VU	NT		High
Cape Shoveler*	<i>Spatula smithii</i>	NT	LC		High

* Species of Conservation Concern

D3 Energy Production Right

Caspian Tern*	<i>Hydroprogne caspia</i>	VU	LC	High	Low
Chestnut-banded Plover*	<i>Charadrius pallidus</i>	VU	LC		Moderate
Curlew Sandpiper*	<i>Calidris ferruginea</i>	VU	VU		Moderate
European Roller*	<i>Coracias garrulus</i>	NT	LC		Low
Fulvous Whistling Duck*	<i>Dendrocygna bicolor</i>	NT	LC		Moderate
Great Crested Grebe*	<i>Podiceps cristatus</i>	VU	LC		High
Great Egret*	<i>Ardea alba</i>	NT	LC		Moderate
Greater Flamingo*	<i>Phoenicopterus roseus</i>	NT	LC		High
Grey Plover*	<i>Pluvialis squatarola</i>	NT	VU		Low
Hamerkop*	<i>Scopus umbretta</i>	NT	LC		Moderate
Kittlitz's Plover*	<i>Charadrius pecuarius</i>	NT	LC		High
Knob-billed Duck*	<i>Sarkidiornis melanotos</i>	NT	LC		Low
Lanner Falcon*	<i>Falco biarmicus</i>	NT	LC		High
Lesser Flamingo*	<i>Phoeniconaias minor</i>	VU	NT		High
Lesser Kestrel*	<i>Falco naumanni</i>	VU	LC		High
Maccoa Duck*	<i>Oxyura maccoa</i>	VU	EN		High
Marsh Owl*	<i>Asio capensis</i>	NT	LC		High
Martial Eagle*	<i>Polemaetus bellicosus</i>	EN	EN		Low
Melodious Lark*	<i>Mirafra cheniana</i>	NT	LC		Moderate
Red-billed Teal*	<i>Anas erythrorhyncha</i>	NT	LC		High
Red-footed Falcon*	<i>Falco vespertinus</i>	VU	VU		Low
Secretarybird*	<i>Sagittarius serpentarius</i>	VU	EN	High	High
Southern Bald Ibis*	<i>Geronticus calvus</i>	NT	NT		Low
Southern Pochard*	<i>Netta erythrophthalma</i>	NT	LC		High
Tawny Eagle*	<i>Aquila rapax</i>	EN	VU		Low
White-backed Duck*	<i>Thalassornis leuconotus</i>	NT	LC		Moderate
Yellow-billed Duck*	<i>Anas undulata</i>	NT	LC		High
Yellow-billed Egret*	<i>Ardea brachyrhyncha</i>	NT	LC		High
Yellow-billed Stork*	<i>Mycteria ibis</i>	VU	LC	High	Moderate

Circus ranivorus (African Marsh Harrier) is listed as EN in South Africa (ESKOM, 2014). This species has an extremely large distributional range in sub-equatorial Africa. South African populations of this species are declining due to the degradation of wetland habitats, loss of habitat through over-grazing and human disturbance and possibly, poisoning owing to over-use of pesticides (IUCN, 2017). This species breeds in wetlands and forages primarily over reeds which may be present surrounding water resources within the Desktop PAOI and Project Area.

Glareola nordmanni (Black-winged Pratincole) is a migratory species which is listed as NT both globally and regionally. This species has a very large range, breeding mostly in Europe and Russia, before migrating to southern Africa. Overall population declines of approximately 20% for this species are suspected (IUCN, 2017). This species generally occurs near water and damp meadows, or marshes overgrown with dense grass, which may be present within the Desktop PAOI and Project Area. Due to

its migratory nature, this species will only be present in South Africa for a few months during the year and will not breed locally.

Eupodotis caerulescens (Blue Korhaan) is endemic to South Africa and Lesotho and occurs in grassveld usually over 1 500 m above sea level, preferring open, fairly short grassland and a mixture of grassland and karoo dwarf-shrubland within 1 km of water, with termite mounds and few or no trees (BirdLife International, 2017). The total global population is estimated to number between 12 000-15 000 individuals, equivalent to 8 000-10 000 mature individuals, with a decreasing population trend. The main threat is intensive agriculture, especially within the east of its range. The grasslands present within the Desktop PAOI and Project Area may be suitable for this species to occur in.

Calidris ferruginea (Curlew Sandpiper) is migratory species which breeds on slightly elevated areas in the lowlands of the high Arctic and may be seen in parts of South Africa during winter. During winter, the species occurs at the coast, but also inland on the muddy edges of marshes, large rivers and lakes (both saline and freshwater), irrigated land, flooded areas, dams and salt pans (IUCN, 2017). The marshes and wetlands within the Desktop PAOI and Project Area may be suitable for this species.

Coracias garrulous (European Roller) is a winter migrant from most of South-central Europe and Asia occurring throughout sub-Saharan Africa (IUCN, 2017). The European Roller has a preference for bushy plains and dry savannah areas, but the grasslands within the Desktop PAOI and Project Area may also be suitable for this species (IUCN, 2017).

Phoenicopterus roseus (Greater Flamingo) is widely distributed throughout sub-Saharan Africa and inhabits shallow eutrophic waterbodies such as saline lagoons, salt pans and large saline or alkaline lakes (BirdLife International, 2019b). Juveniles, and to a lesser extent adults undertake irregular nomadic or partially migratory movements throughout the species' range in response to water-level changes. In sub-Saharan Africa, the species may also join large flocks of non-breeding *Phoeniconaias minor* (Lesser Flamingo). The sub-Saharan African populations between 100 000 and 120 000 mature individuals. The species suffers from low reproductive success if exposed to disturbance at breeding colonies, or if water-levels surrounding nest-sites lower resulting in increased predation from ground predators. Further threats include effluents mining, pollution from sewage and heavy metal effluents from industries and collisions with powerlines (BirdLife International, 2019b). Larger and smaller water resources in and around the Desktop PAOI and Project Area were found on a desktop basis and may be suitable for this species.

Rostratula benghalensis (Greater Painted-Snipe) shows a preference for recently flooded areas in shallow lowland freshwater temporary or permanent wetland, it has a wide range of these freshwater habitats which they occur in, such as, sewage pools, reservoirs, mudflats overgrown with marsh grass (IUCN, 2017). The wetlands in the Desktop PAOI and Project Area may be deemed suitable for this species.

Falco biarmicus (Lanner Falcon) is native to South Africa and inhabits a wide variety of habitats, from lowland deserts to forested mountains (IUCN, 2017). Global population estimates are more than 30000 breeding pairs, in South Africa it is estimated to be 1400 pairs. They may occur in groups up to 20 individuals but have also been observed solitary. They are partial and facultative migrants, that breeds from May to early September. Nests are mostly found on cliff ledges, and they may alternate between more than one nest. Their diet is mainly composed of small birds such as pigeons and francolins. Anecdotal evidence suggests these species are susceptible to agrochemicals, another threat to their population is the clearing of grassland habitats (Roberts *et al.*, 2023). The grasslands and agricultural fields within the Desktop PAOI and Project Area may be suitable foraging grounds for this SCC.

Phoeniconaias minor (Lesser Flamingo) is widely distributed throughout sub-Saharan Africa but mainly breeds in the Rift Valley Lakes in East Africa, with smaller breeding congregations in West Africa and southern Africa. This species is nomadic and makes extensive movements in response to environmental conditions and southern African populations are partially migratory, with many making

regular movements from their breeding sites inland to coastal wetlands when not breeding (BirdLife International, 2018). The species is an obligate filter feeder and feeds during the night and early morning when the surface of the water is calm, primarily by swimming and filtering the algae near the surface. The global population has been estimated at between 2 220 000-3 240 000 individuals, with a declining population trend. The main threat is breeding habitat loss due to mining and hydro-electric power (BirdLife International, 2018). Further threats include effluents mining, pollution from sewage and heavy metal effluents from industries and collisions with powerlines. Larger and smaller water resources in and around the Desktop PAOI and Project Area may be suitable for this species.

Sagittarius serpentarius (Secretarybird) is listed as EN on a global scale (BirdLife International, 2020). The species has a wide distribution across sub-Saharan Africa, but surveyed densities suggest that the total population size does not exceed a five-figure number. Ad-hoc records, localised surveys and anecdotal observations indicate apparent declines in many parts of the species' range, especially in South Africa where reporting rates decreased by at least 60% of quarter degree grid cells used in Southern African Bird Atlas Projects. Threats include excessive burning of grasslands that may suppress populations of prey species, whilst the intensive grazing of livestock is also probably degrading otherwise suitable habitat. Disturbance by humans is likely to negatively affect breeding. The species is captured and traded; however, it is unknown how many deaths occur in captivity and transit. Direct hunting and nest-raiding for other uses and indiscriminate poisoning at waterholes are also further threats. A proposed conservation action is that landowners of suitable properties should join biodiversity stewardship initiatives and to manage their properties in a sustainable way for the species' populations. The grasslands and agricultural fields within the Desktop PAOI and Project Area may be suitable foraging grounds for this SCC.

3.2 Fieldwork Findings

3.2.1 Field Assessment

The following sections discuss the results from the field survey that was conducted for the proposed project. The habitats observed are discussed below (Table 3-6). The fieldwork within the Desktop PAOI was focused within the Project Area, and thus the findings pertain to those areas.

Table 3-6 ***Sensitivity summary of the habitat types delineated within the PAOI.***

Habitat	Description and Ecological Processes	Condition	SEI	Size (~ha)
Modified	Modified areas are regions that have undergone significant anthropogenic disturbance, including major roads, cultivated fields, urban infrastructure, and other artificial surfaces. These landscapes are dominated by non-natural land cover, such as asphalt, concrete, and intensively managed agricultural land, with indigenous vegetation largely absent and often replaced by crops, exotic plants, or AIP. The structure and composition of these areas are heavily influenced by ongoing human activities, resulting in a highly altered ecological state. The ecosystem has been entirely modified, resulting in the near-total loss of its original composition and structure. Most or all ecological functions have been eliminated. The presence of AIP is common and further contributes to the modified character of these areas.	Irreversibly and Severely Modified	Very Low	679.04
	Due to the intensive nature of agricultural practices, the dominance of artificial surfaces, and the lack of indigenous vegetation, the ecological services provided by these habitats are significantly limited. Key natural processes such as soil stabilization, water infiltration, nutrient cycling, and support for indigenous biodiversity are greatly reduced or absent compared to more natural or semi-natural habitats. The absence of natural vegetation restricts opportunities for foraging, breeding, and refuge for indigenous flora and fauna, and the habitat does not provide viable conditions for their persistence. The dominance of AIP can further disrupt ecosystem functioning by outcompeting indigenous species and altering habitat structure.			

D3 Energy Production Right

No fauna or flora SCC were observed during the field survey, and none are expected to occur within these modified areas due to the lack of suitable habitat and resources. However, certain features within the modified landscape, such as field margins, irrigation channels, or uncultivated strips, may still function as movement corridors or temporary refuges for locally common fauna, particularly small mammals, birds, and invertebrates adapted to disturbed environments. These features can facilitate limited ecological connectivity across the landscape, albeit at a much-reduced level compared to more intact habitats.

The habitat is not considered a viable CBA 1, CBA 2, ESA 1 or ESA 1, nor is it representative of the Vaal-Vet Sandy Grassland (EN), Central Free State Grassland (LC), Highveld Alluvial Vegetation (LC) or Bloemfontein Karroid Shrubland (LC) ecosystems. This habitat unit will not recover without active human intervention.



Alluvial vegetation refers to plant communities that grow on soils deposited by rivers, streams, or other running water. These soils, known as alluvium, are typically found in floodplains, riverbanks, and deltas. Alluvial vegetation is adapted to periodic flooding, fluctuating water tables, and nutrient-rich, often loose or sandy soils. This type of vegetation plays a crucial role in stabilizing riverbanks, filtering water, and providing habitat for wildlife.

Alluvial Vegetation

Although the alluvial habitat is classified as semi-natural, it has been subject to various disturbances, including fragmentation, livestock grazing, and erosion. Despite these pressures, the alluvial habitat generally retains intact ecological functioning, largely due to the faunal communities it continues to support. However, the ecological condition across the unit is not uniform; it fluctuates in response to differing land uses and the intensity of disturbances.

Disturbed **Medium** 242.65

Certain sections have been impacted by both historical and ongoing grazing, while others are more affected by the proliferation of AIP and edge effects on floral communities, resulting in reduced habitat integrity. The overall variation in habitat condition is therefore closely linked to the degree of

D3 Energy Production Right

disturbance, with some areas experiencing more pronounced overgrazing. Importantly, these alluvial areas remain connected to, and play a vital role in supporting, adjacent water resource habitats.

Indigenous species observed within the habitat include *Vachellia karroo*, *Gymnosporia buxifolia*, *Ziziphus mucronata*, *Panicum maximum*, *Felicia muricata*, *Chloris virgata*, and *Eragrostis plana*. Dominant AIP present in more disturbed areas are *Salix babylonica*, *Populus alba*, and *Melia azedarach*. In addition, one (1) Provincial Protected Flora species - *Ammocharis coranica* - was observed, as listed in Schedule 6 of the Free State Nature Conservation Ordinance 8 of 1969.

Section within the habitat is considered viable ESA 1 and ESA 2. No fauna or flora SCC were observed during the field survey. Nevertheless, this habitat provides refuge, grazing, and foraging resources for both indigenous fauna and livestock, and contributes to water filtration as it percolates through the soil into drainage areas. Serving as an important ecological corridor, the alluvial habitat facilitates fauna dispersion and movement across the landscape. It is utilised by faunal species throughout various life stages and may support multiple SCC. While flora SCC are not anticipated, fauna SCC, particularly avifauna, are likely to make use of this habitat.



Central Free State Grassland and Central Free State Grassland (No Access)	This habitat is characterised by a predominance of grassy ground layers, with <i>Heteropogon contortus</i> , <i>Eragrostis curvula</i> , and <i>Eragrostis chloromelas</i> identified as the dominant grass species. Scattered patches of <i>Themeda triandra</i> were also observed within the unit. Noticeable encroachment by <i>Vachellia karroo</i> is evident, primarily as a result of historical and ongoing overgrazing. Additionally, several AIP, including <i>Verbena officinalis</i> and <i>Xanthium strumarium</i> , are present within the habitat.	Semi-natural and Disturbed	Medium	923.21
	Sections of the habitat have experienced historical agricultural activities, with species such as <i>Aristida adscensionis</i> , <i>Aristida congesta</i> , and <i>Sporobolus fimbriatus</i> observed in more disturbed areas. Despite these disturbances and ongoing transformation, the habitat retains certain structural and floristic			and 283.37

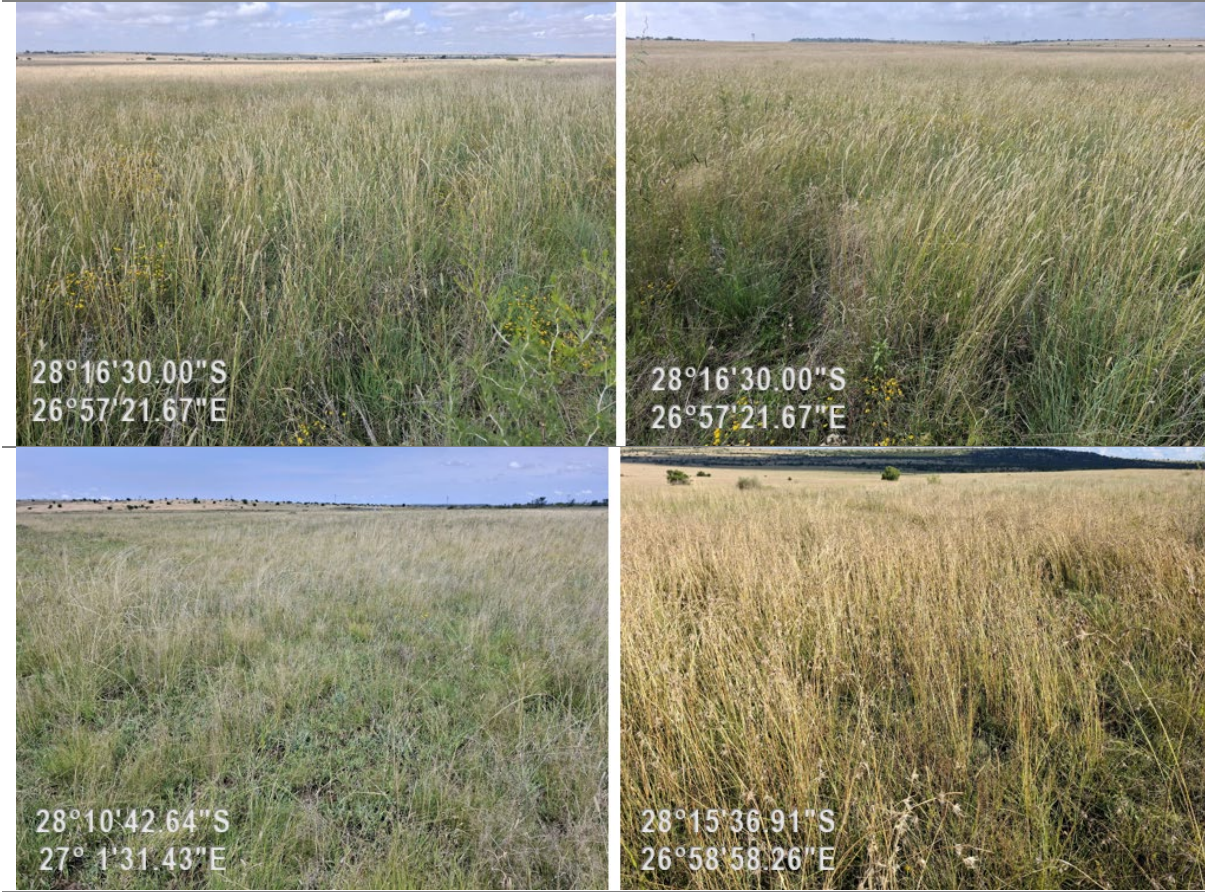
D3 Energy Production Right

elements characteristic of the Central Free State Grassland (LC) and is considered representative of this vegetation type (RLE, 2022).

In addition, two Provincial Protected Flora species: *Boophone distachia* and *Helichrysum nudifolium*, were observed, as listed in Schedule 6 of the Free State Nature Conservation Ordinance 8 of 1969. No fauna or flora SCC were observed during the field survey.

Sections within the habitat are considered viable CBA 1, CBA 2, ESA 1, ESA 2, and representative of the Central Free State Grassland (LC). However, it should be noted that some areas (approximately 429.35 ha) within the habitat unit were not assessed due to access restrictions.

Ecologically, this habitat provides a range of important services. It offers refuge, grazing, and foraging resources for indigenous fauna and livestock, and serves as a movement corridor for fauna between areas. The habitat aids in the filtration of water as it permeates through the soil into drainage areas, provides erosion control, and contributes to pollination and seed dispersal processes. Additionally, the presence of diverse grass and forb species supports soil fertility and nutrient cycling, while the structural complexity of the vegetation enhances microhabitat availability for a variety of invertebrates and small vertebrates.



**Disturbed
Central Free
State
Grassland**

The habitat is primary in nature, with some levels of anthropogenic disturbance, particularly from AIPs and mismanagement of the field. The vegetation structure is dominated by indigenous grasses such as *Themeda triandra*, *Eragrostis superba*, *Bromus catharticus*, *Paspalum dilatatum*, *Trichoneura grandiglumis*, *Eragrostis plana*, *Elionurus muticus*, *Melinis repens*, and *Heteropogon contortus*. The grassland is interspersed with forbs and herbs, supporting a diverse assemblage of indigenous flora.

Bush encroachment by woody and shrubby species is evident in certain sections, with species such as *Vachellia karroo*, *Seriphium plumosum*, *Diospyros austro-africana*, *Lycium cinereum*, and *Rosa rubiginosa* present.

Disturbed **Medium** 1795.97

D3 Energy Production Right

Two (2) Provincial Protected Flora, *Ammocharis coranica* (Berg Lily) and *Eucomis autumnalis* (Pineapple Lily), were observed in terms of Schedule 6 of the Free State Nature Conservation Ordinance 8 of 1969.

AIPs are present within this habitat, with notable species including *Verbena officinalis*, *Agave americana*, *Datura ferox*, *Eucalyptus sideroxylon* and *Eucalyptus camaldulensis*. These AIPs are particularly prevalent in disturbed or overgrazed patches and contribute to the ongoing transformation of the ecosystem.

Sections within the habitat are considered viable, CBA 2, ESA 1, ESA 2, and representative of the Central Free State Grassland (LC; RLE, 2022). These areas retain certain structural and floristic elements characteristic of their respective vegetation types, despite the presence of disturbance and ongoing transformation.

No fauna or flora species of conservation concern were observed during the field survey. While the likelihood of fauna SCC occurring in this habitat unit is considered low, there remains a possibility that flora SCC may be present.

Despite the presence of disturbance and ongoing transformation, this habitat unit continues to provide important ecosystem services. These include forage and grazing for indigenous fauna and livestock, soil stabilisation, water filtration, and support for pollinators and other ecosystem functions. The habitat also offers refuge and movement corridors for locally common fauna. However, the ecological integrity and functioning of the habitat are compromised by the presence of AIPs, bush encroachment, and mismanagement, which reduce the overall provision of ecosystem services and threaten the persistence of indigenous biodiversity. Active management is required to control AIPs, prevent further encroachment, and support the recovery of indigenous species and ecosystem processes.



Degraded Grassland	This habitat is secondary in nature due to historic and ongoing anthropogenic activities. The most notable impacts on this habitat are the presence of AIPs, and encroachment of woody species.	Degraded	Low	138.12
---------------------------	---	----------	-----	--------

D3 Energy Production Right

Alien invasive plants such as *Tagetes minuta*, *Solanum campylacanthum* and *Xanthium spinosum* are common, often forming dense stands in some areas. Despite the disturbance, a diverse assemblage of indigenous flora persists, including grasses such as *Themeda triandra*, *Eragrostis curvula*, *Heteropogon contortus*, and *Digitaria eriantha*.

No fauna or flora SCC were observed during the field survey. Despite fragmentation and ongoing degradation, this habitat continues to provide important ecosystem services, including foraging and grazing for indigenous fauna and livestock, refuge and movement corridors for fauna, soil stabilisation, water filtration, and support for pollinators and other ecosystem functions.

The habitat is not considered a viable CBA 2, ESA 1 or ESA 2, nor is it representative of the Vaal-Vet Sandy Grassland (EN), Highveld Alluvial Vegetation (LC) or Central Free State Grassland (LC) ecosystem.

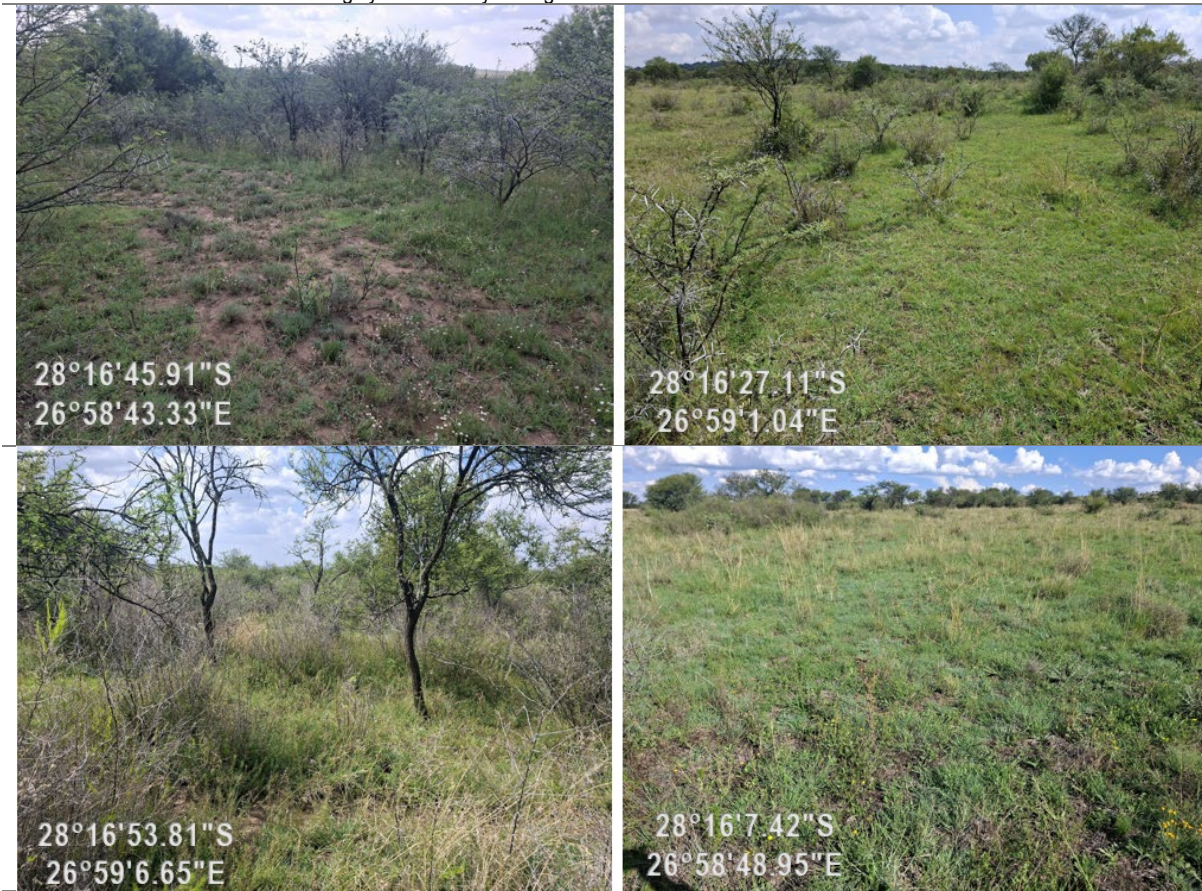
The habitat provides limited grazing and foraging resources for indigenous fauna and livestock, aids in the filtration of water permeating through the soil into drainage areas and serves as an important corridor for fauna dispersion within the landscape. In many cases, these areas may function as movement corridors and form a barrier between more degraded and modified areas.



Winberg Grassy Shrubland	This habitat is primary in nature, with some levels of anthropogenic disturbance. and is characterised by grass and woody layers. Dominant grasses observed in the unit are <i>Aristida adscensionis</i> , <i>A. congesta</i> , <i>A. diffusa</i> , <i>Cymbopogon pospischilii</i> , <i>Cynodon dactylon</i> , <i>C. incompletus</i> , <i>Eragrostis chloromelas</i> and <i>E. lehmanniana</i> . Dominant tree species were <i>Vachellia karroo</i> , <i>Celtis africana</i> and <i>Ziziphus mucronata</i> .			
	No fauna or flora SCC were observed during the field survey. However, fauna SCC, particularly avifauna, are likely to make use of the habitats for foraging.			
	The habitat is considered viable constitutes of CBA 2, ESA 1, and ESA 2.			
	Semi-natural	Medium	609.59	

D3 Energy Production Right

Provides refuge, grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas and provides erosion control. Contributes to the processes of pollination and seed dispersal. Provides movement corridors and natural habitat in an area largely disturbed by mining activities.



This habitat unit is classified as secondary grassland, having developed on land previously used for agriculture and subsequently abandoned, which has allowed for partial natural regeneration. The vegetation is characterised by a mix of indigenous grassland species, including grasses such as *Eragrostis curvula*, *Eragrostis plana*, *Elionurus muticus*, *Aristida congesta*, *Cymbopogon pospischilii*, *Setaria sphacelata*, and *Themeda triandra*. The dominant shrub present is *Seriphium plumosum*.

Despite the persistence of indigenous flora, the habitat exhibits significant levels of disturbance, most notably from AIPs such as *Opuntia cespitosa*, *Opuntia lasiacantha*, *Tagetes minuta*, *Verbena incompta*, *Datura ferox*, *Argemone ochroleuca*, *Solanum sisymbriifolium*, *Plantago lanceolata*, *Trichocereus spachianus*, *Curium vulgare*, *Bidens pilosa* and *Verbena officinalis*.

No fauna or flora SCC were observed during the field survey. However, fauna SCC, particularly avifauna, are likely to make use of the habitats for foraging.

The habitat is not considered a viable ESA 1 and ESA 2 nor is it representative of the Central Free State Grassland LC ecosystem.

Despite fragmentation and ongoing degradation, this secondary grassland habitat continues to provide important ecosystem services. These include foraging and grazing opportunities for indigenous fauna and livestock, refuge and movement corridors for fauna, soil stabilisation, water filtration, and support for pollinators and other ecosystem functions.

Secondary
Central Free
State
Grassland

Disturbed Low 124.03

D3 Energy Production Right

Active management is required to control AIPs with restoration efforts focusing on promoting indigenous species recovery, maintaining habitat connectivity, and supporting the continued provision of ecosystem services.



This habitat is primary in nature, with moderate levels of anthropogenic disturbance, particularly from overgrazing and the presence of AIPs. The habitat unit is comprised of a rocky outcrop, supporting a mosaic of grass and woody layers. Characteristic species observed within this habitat unit include *Vachellia karroo*, *Searsia erosa*, *Searsia dentata*, *Euclea crispa* and *Gymnosporia buxifolia* among others. The grass layer is represented by species such as *Digitaria eriantha*, *Eragrostis plana*, *Elionurus muticus*, *Aristida congesta*, and *Melinis repens*.

This habitat type is regarded as a disturbed rocky outcrop grassland due to visible signs of overgrazing by cattle, as well as the widespread occurrence of AIP such as *Eucalyptus camaldulensis*, *Opuntia cespitosa*, *Tagetes minuta*, *Verbena officinalis*, *Gleditsia triacanthos*, *Datura ferox* and others. While the structural diversity of the habitat remains relatively intact, ongoing grazing pressure and alien plant invasion have resulted in moderate degradation.

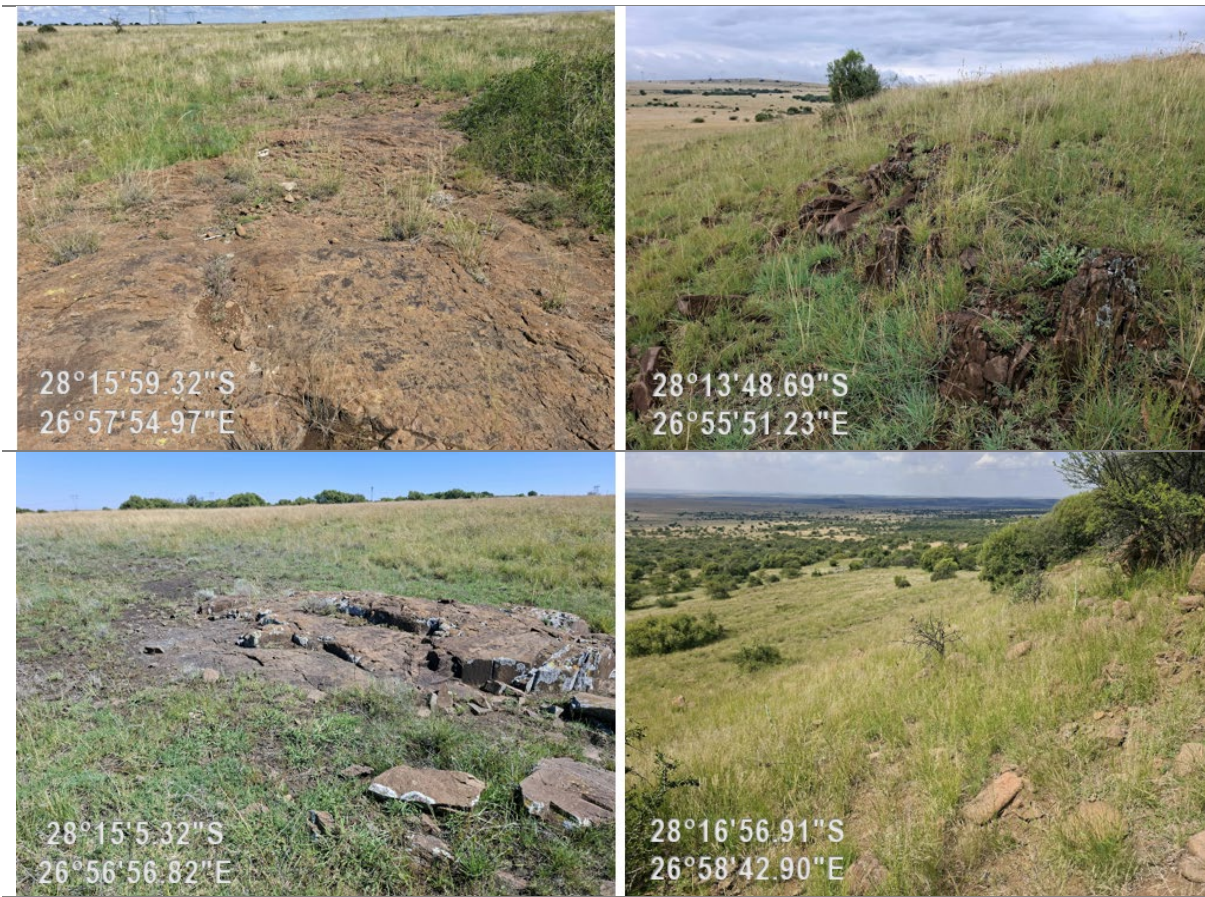
**Rocky
Grassland**

Intact High 513.69

This habitat is a representative of the Central Free State Grassland (LC) and Bloemfontein Karroid Shrubland Bioregion (LC; RLE, 2022).

No fauna or flora SCC were observed during the field survey; however, there is a possibility that SCC could occur in this habitat unit.

The ecosystem processes and services are affected by the current disturbances present within this habitat unit. The overgrazing and habitat destruction associated with mechanical excavation and dumping has driven a decrease in the overall functionality and integrity of this habitat. The habitat does, however, benefit the surrounding areas with seed dispersal and plant recruitment. This habitat also acts as a movement corridor for local faunal species.



Water Resources	This is a non – terrestrial habitat and are permanently to seasonally wet portions of land as delineated by the wetland specialists. These include different natural wetland/aquatic systems but also artificial water resources with different sensitivity levels. These include Artificial Drainage Channel, Artificial Wet Area, Depression Wetland, UVB Wetland, Seep Wetland, CVB Wetland, Drainage lines, Dams and Reservoirs. Common species observed along watercourses include <i>Combretum</i> spp., <i>Ziziphus mucronata</i>, <i>Cyperus</i> spp. and <i>Typha capensis</i>. For more details pertaining to Water Resources please refer to the Wetland Assessment Report (TBC, 2026).			
	Although no fauna or flora SCC were observed during the field survey, some suitable habitat is present within this unit and may support SCC, particularly in less disturbed or more structurally diverse areas.			
	Even though it is somewhat disturbed the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system locally and regionally, and an important habitat for various fauna and flora. These systems also provide movement corridors, refuge and foraging resources.			
	Artificial, Disturbed and Natural	Low High	-	520.44



3.2.2 Flora Assessment

This section is divided into two sections:

- Indigenous flora;
- Protected flora and
- Alien Invasive Plants (AIPs).

3.2.2.1 Indigenous Flora

The vegetation assessment was conducted throughout the extent of the target areas. The species composition within the assessment area aligns with what is typically found in the vegetation types, considering some impact. This is largely due to some disturbance, as the land is primarily used for livestock grazing. Within this vegetation type, distinct communities were identified and can be categorized which varied across the Desktop PAOI and Project Area. The list of plant species recorded is not exhaustive (can be provided upon request), and additional surveys conducted during different phenological periods, those not yet covered, could potentially reveal up to 20% more flora species in the Desktop PAOI and Project Area. Nevertheless, the floristic analysis completed thus far is considered a reliable representation of the local flora for the Desktop PAOI and Project Area.

3.2.2.2 Protected Flora

Nine (9) species of provincially protected plant were recorded for the Project Area: *Ammocharis coranica* (Berg Lily), *Anacampseros papyracea* (Karoo Gansmis), *Anacampseros subnuda subnuda*, *Boophone disticha* (Bushman Poison Bulb), *Eucomis autumnalis* (Pineapple Lily), *Euphorbia clavarioides* (Lion's Spoor), *Gladiolus permeabilis edulis*, *Helichrysum nudifolium* (Hairy Everlasting)

and *Helichrysum zeyheri* (Vaalbergkaroo). These species occurred in various habitat units within the Project Area. All are protected under Schedule 6 in the Free State Nature Conservation Ordinance No. 8 of 1969.

According to the list of protected species under the Schedule, if any individuals of these plant species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA). Given the presence of suitable grassland habitat on site, additional protected species may occur within the Desktop PAOI and Project Area. A site walkdown should therefore be undertaken prior to development, with any protected species identified on site to be marked and avoided, if not possible to avoid, then relocated to a nearby area of similar habitat outside the project impact area.

3.2.2.3 Alien Invasive Plants

Alien Invasive Plants (AIPs) tend to dominate or replace indigenous flora, thereby transforming the structure, composition and functioning of ecosystems. Therefore, it is important that these plants are controlled by means of an eradication and monitoring programme. Some invader plants may also degrade ecosystems through superior competitive capabilities to exclude native plant species.

The National Environmental Management: Biodiversity Act (NEMBA) is the most recent legislation pertaining to alien invasive plant species. In August 2014, the list of Alien Invasive Species was published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 78 of 2014). The Alien and Invasive Species Regulations were published in the Government Gazette No. 43726, 18 September 2020. The legislation calls for the removal and / or control of alien invasive plant species (Category 1 species). In addition, unless authorised thereto in terms of the National Water Act, 1998 (Act No. 36 of 1998), no land user shall allow Category 2 plants to occur within 30 meters of the 1:50 year flood line of a river, stream, spring, natural channel in which water flows regularly or intermittently, lake, dam or wetland. Category 3 plants are also prohibited from occurring within proximity to a watercourse. Below is a brief explanation of the three categories in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA):

- Category 1a: Invasive species requiring compulsory control. Remove and destroy. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.
- Category 1b: Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- Category 2: Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- Category 3: Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- Notify the competent authority in writing;

- Take steps to manage the listed invasive species in compliance with:
- Section 75 of the Act;
- The relevant invasive species management programme developed in terms of regulation 4; and
- Any directive issued in terms of section 73(3) of the Act.

Nineteen (19) AIP species were recorded for the PAOI. These species are listed under the Alien and Invasive Species List 2020, Government Gazette No. GN1003. Four (4) of these species are NEMBA category 1b AIP species that must be controlled by implementing an AIP Management Programme, in compliance with section 75 of NEMBA, as stated above (Table 3-7).

Table 3-7 Table presenting the alien and invasive species recorded for the PAOI

Family	Scientific Name	Common Name	Category
Asteraceae	<i>Bidens pilosa</i>	Blackjack	Naturalized exotics
Asteraceae	<i>Cirsium vulgare</i>	Spear thistle	Not indigenous; Naturalised; Invasive
Asteraceae	<i>Erigeron bonariensis</i>	Flax-leaf Fleabane	Not indigenous; Naturalised; Invasive
Asteraceae	<i>Tagetes minuta</i>	Marigold	Naturalized exotics
Asteraceae	<i>Xanthium spinosum</i>	Spiny cocklebur	NEMBA 1b
Asteraceae	<i>Xanthium strumarium</i>	Large cocklebur	NEMBA 1b
Asteraceae	<i>Zinnia peruviana</i>	Redstar Zinnia	Naturalized exotics
Cactaceae	<i>Cylindropuntia imbricata</i>	Imbricate Cactus	Not indigenous; Naturalised; Invasive
Cactaceae	<i>Opuntia cespitosa</i>	Saucepan cactus	NEMBA 1b
Cactaceae	<i>Opuntia lasiacantha</i>	Red Prickly Pear	Not indigenous; Cultivated; Naturalised; Invasive
Cactaceae	<i>Trichocereus spachianus</i>	Torch Cactus	NEMBA 1b
Fabaceae	<i>Gleditsia triacanthos</i>	Comon Honeylocust	Not indigenous; Naturalised; Invasive
Malvaceae	<i>Hibiscus trionum</i>	Flower-of-An-Hour	Not indigenous; Naturalised
Myrtaceae	<i>Eucalyptus camaldulensis</i>	River Red Gum	Not indigenous; Naturalised; Invasive
Myrtaceae	<i>Eucalyptus sideroxylon</i>	Red Ironbark	Not indigenous; Naturalised; Invasive
Salicaceae	<i>Salix babylonica</i>	Weeping Willow	Naturalized exotics
Solanaceae	<i>Solanum campylacanthum</i>	Bitter Apple	Naturalized exotics
Verbenaceae	<i>Verbena incompta</i>	Purpletop Vervain	Naturalized exotics
Verbenaceae	<i>Verbena officinalis</i>	Wild Verbena	Naturalized exotics

3.2.3 Fauna Assessment

Mammal, herpetofauna and avifauna observations and recordings fall under this section.

3.2.3.1 Mammals

The mammal species recorded for the Project Area during the field survey are presented in Table 3-8 below. No SCC was observed during the assessment. Additional common mammal species are expected for the Desktop PAOI, along with some SCC. Fauna will most likely use broader area as movement corridor for general habitat (refuge, hunting/feeding, etc). To yield a higher species count, long-term surveys over multiple temporal periods would be required.

Table 3-8 **Table presenting the mammal species recorded for the Project Area during the field survey (LC = Least Concern and NT = Near Threatened)**

Scientific Name	Common Name	Conservation Status	
		SANBI	IUCN
<i>Canis mesomelas</i>	Black-Backed Jackal	LC	LC
<i>Cynictis penicillata</i>	Yellow Mongoose	LC	LC
<i>Felidae</i> spp.			
<i>Felis lybica</i>	African Wildcat	LC	LC
<i>Kobus ellipsiprymnus</i>	Lechwe	LC	NT
<i>Phacochoerus africanus</i>	Warthog	LC	LC
<i>Orycteropus afer</i>	Aardvark	LC	LC
<i>Raphicerus campestris</i>	Steenbok	LC	LC
<i>Tragelaphus strepsiceros</i>	Kudu	LC	LC

3.2.3.2 Herpetofauna

Reptile and amphibian species recorded for the Project Area during the field survey are presented in Table 3-9 below. Additional common herpetofauna species are expected for the Desktop PAOI.

Table 3-9 *Table presenting the reptile and amphibian species recorded for the Project Area during the field survey (LC = Least Concern)*

Scientific Name	Common Name	Conservation Status	
		SANBI	IUCN
Reptile			
<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC	LC
Amphibian			
<i>Poyntonophrynus vertebralis</i>	Southern Pygmy Toad	LC	LC
<i>Sclerophrys capensis</i>	Ranger’s Toad	LC	LC

3.2.3.3 Avifauna

Thirty (30) species of bird were recorded for the PAOI during the survey based on either direct observation, vocalisations, or the presence of visual tracks and signs (Table 3-10). Four (4) species are SCC. These species are likely to make use of the water resource and the surrounding grassland habitats.

Table 3-10 *Table presenting the avifauna species recorded for the PAOI during the field survey*

Species	Common Name	Conservation Status		Free State Nature Conservation Ordinance 8 of 1969
		Regional	IUCN	
<i>Afrotis afraoides</i>	Northern Black Korhaan	Unlisted	LC	Schedule 1
<i>Anas undulata</i>	Yellow-billed Duck	Unlisted	LC	Schedule 2
<i>Ardea ibis</i>	Western Cattle Egret	LC	LC	-
<i>Asio capensis</i> *	Marsh Owl	NT	LC	-
<i>Bostrychia hagedash</i>	Hadada Ibis	Unlisted	LC	Schedule 1
<i>Centropus burchellii</i>	Burchell's Coucal	Unlisted	LC	-
<i>Colius colius</i>	White-backed Mousebird	LC	LC	-
<i>Corvus albus</i>	Pied Crow	Unlisted	LC	-
<i>Dendrocygna viduata</i>	White-faced Whistling Duck	Unlisted	LC	Schedule 1
<i>Elanus caeruleus</i> *	Black-winged Kite	NT	LC	Schedule 2
<i>Estrilda astrild</i>	Common Waxbill	LC	LC	-
<i>Fulica cristata</i>	Red-knobbed Coot	LC	LC	Schedule 2
<i>Gallinago nigripennis</i>	African Snipe	LC	LC	-
<i>Grus paradisea</i> *	Blue Crane	VU	VU	Schedule 2
<i>Lanius collaris</i>	Southern Fiscal	Unlisted	LC	Schedule 2
<i>Macronyx capensis</i>	Cape Longclaw	Unlisted	LC	Schedule 1
<i>Merops apiaster</i>	European Bee-eater	Unlisted	LC	-

* Species of Conservation Concern

D3 Energy Production Right

<i>Myrmecocichla formicivora</i>	Ant-eating Chat	LC	LC	-
<i>Numida meleagris</i>	Helmeted Guineafowl	LC	LC	-
<i>Plocepasser mahali</i>	White-browed Sparrow-Weaver	LC	LC	-
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	Unlisted	LC	Schedule 2
<i>Scopus umbretta</i> *	Hamerkop	NT	LC	Schedule 1
<i>Tachybaptus ruficollis</i>	Little Grebe	Unlisted	LC	Schedule 2
<i>Tadorna cana</i>	South African Shelduck	LC	LC	Schedule 2
<i>Threskiornis aethiopicus</i>	African Sacred Ibis	Unlisted	LC	-
<i>Trachyphonus vaillantii</i>	Crested Barbet	Unlisted	LC	-
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	Unlisted	LC	Schedule 1
<i>Upupa epops</i> spp. <i>africana</i>	African Hoopoe	Unlisted	LC	-
<i>Uraeginthus angolensis</i>	Blue Waxbill	LC	LC	-
<i>Vanellus armatus</i>	Blacksmith Lapwing	Unlisted	LC	Schedule 1
<i>Vanellus coronatus</i>	Crowned Lapwing	Unlisted	LC	Schedule 1

3.3 Habitat Assessment

The habitat assessment for the Desktop PAOI was completed in the following way:

- Desktop habitat delineation for the Desktop PAOI (Figure 3-11);
- Extrapolation of habitats observed within the Seismic Transects and 500m Buffer; and
- Habitat delineations based on the field observation for the Project Area (these can be seen in Table 3-6 and Figure 3-12).

Descriptions of the habitat units can be found in Table 3-11.

Table 3-11 Table providing descriptions of the habitat types

Habitat	Description and Ecological Processes	Condition	SEI
Agricultural	The habitat unit represents areas where vegetation cover has been significantly impacted by both current and historical agricultural activities, as well as by infrastructure associated with these activities. This habitat unit has no conservation value from an ecological perspective.	Degraded	Very Low
	The ecological processes and services provided by this habitat unit are almost non-existent due to the extensive modification and transformation associated with intensive crop cultivation. Natural ecosystem functions such as soil stabilisation, water filtration, and support for indigenous biodiversity are severely diminished. The absence of natural vegetation and habitat complexity further limits the provision of ecological services to the surrounding environment.		
	No flora SCC are expected within this habitat unit.		
Water Features	Impacted permanently to seasonally wet portions of land as delineated by the wetland specialist. Even though somewhat disturbed, the ecological integrity, importance and functioning of these areas play a crucial role as a water resource system locally and regionally and an important habitat for various fauna and flora.	Artificial, Disturbed Natural	and High

D3 Energy Production Right

	Provides surface water resources within the landscape. Aids in trapping sediment and nutrients carried by surface runoff. Corridor for fauna dispersion within the landscape and important foraging and nesting habitat.		
	No flora SCC are expected within this habitat unit. However, fauna SCC, particularly avifauna, are likely to make use of the habitat.		
Degraded Grassland	The current ecological condition of this habitat, regarding the driving forces, are inconsistent due to the different land uses. Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape.	Degraded	Low
	No flora SCC are expected within this habitat unit. However, fauna SCC, particularly avifauna, are likely to make use of the habitat.		
Fallow	The habitat unit consists of previously cultivated land that is currently left unplanted and unmanaged. Vegetation is dominated by pioneer and ruderal species, with a mix of annual and perennial grasses, forbs, and frequent AIP. Indigenous grassland elements are limited, and soil structure is often degraded due to past cultivation. While native plant diversity and ecological integrity are reduced, these areas may provide temporary foraging and refuge for generalist fauna. Overall, fallow units have limited ecological function and low potential to support species of conservation concern.	Degraded	Low
	Fallow habitat units provide limited ecosystem services, including basic soil stabilisation, some nutrient cycling, and reduced water infiltration due to degraded soils. They offer temporary foraging and refuge for generalist fauna and may support pollinators through flowering pioneer species. These areas also act as seed banks for both indigenous and invasive plants, but overall ecological function remains low compared to intact grassland.		
Grassland	The grassland habitat unit is characterised by a continuous cover of indigenous grasses, interspersed with a variety of forbs and occasional shrubs. This unit typically supports a high diversity of indigenous plant species and maintains a well-developed soil structure. The vegetation is dominated by perennial grasses, with species composition and structure reflecting minimal disturbance and good ecological integrity. Grassland habitats provide important resources and habitat for a wide range of fauna, including small mammals, birds, and invertebrates.	Semi-Natural and Disturbed	Medium
	Provides grazing and foraging resources for indigenous fauna and livestock. Aids in the filtration of water permeating through the soil into the drainage areas. Important corridor for fauna dispersion within the landscape. The areas may be used as a movement corridor and in many cases form a barrier between the more degraded and the modified areas.		
Modified	Modified areas include areas such as major roads, mines and associated infrastructure as well as areas currently under construction for mining purposes. These areas have been transformed and are in a modified state. AIP is common in some sections.	Irreversibly and Severely Modified	Very Low
	The ecosystem has been entirely modified, resulting in the near-total loss of its original composition and structure. Most or all ecological functions have been eliminated, and these changes are permanent.		

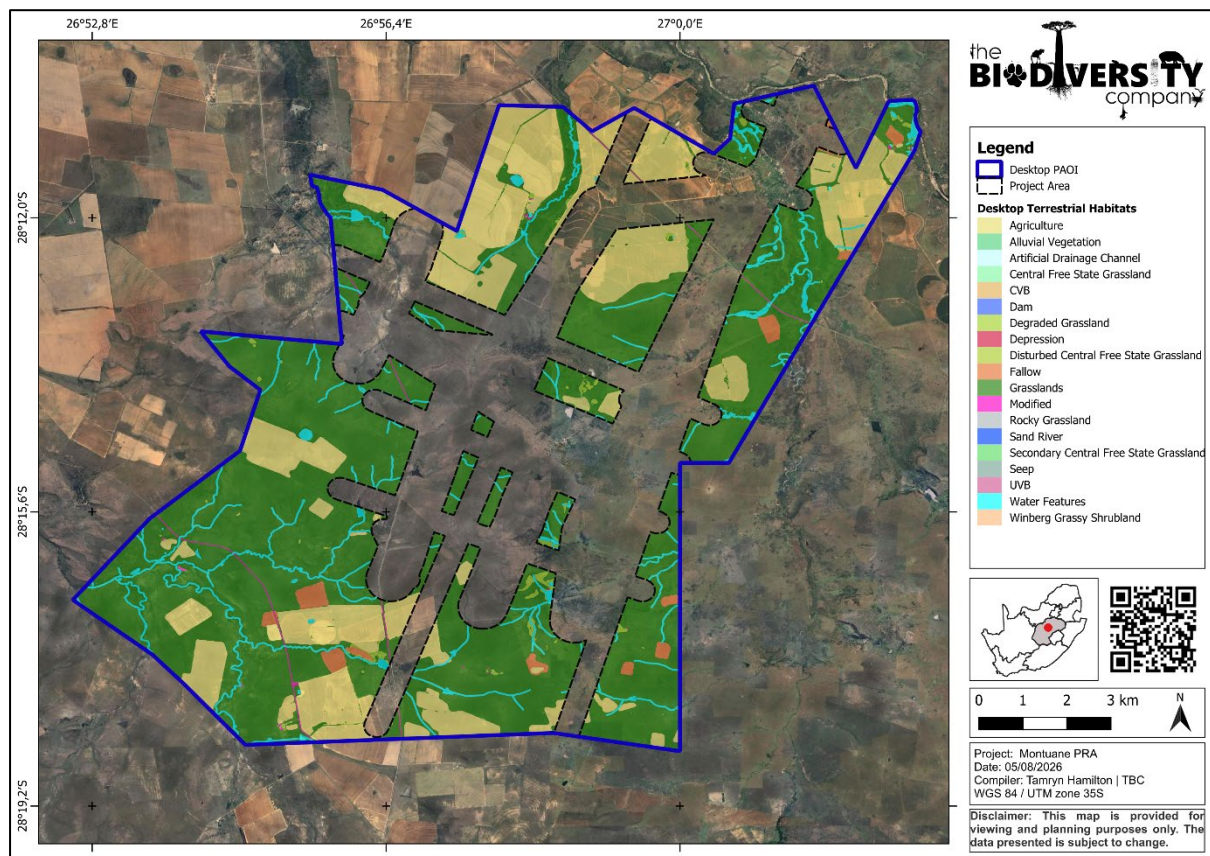


Figure 3-11 *Habitat Units Delineated for the Desktop PAOI*

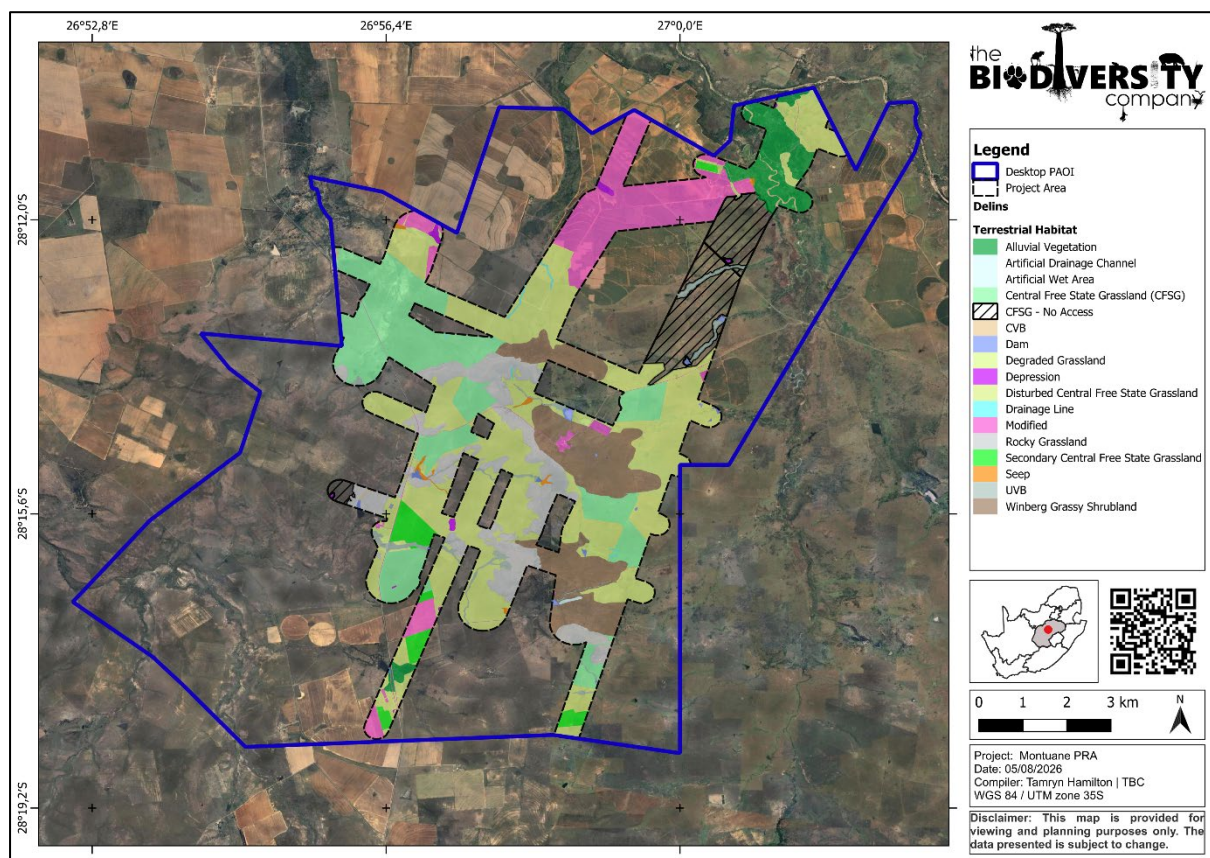


Figure 3-12 *Habitat Units Delineated for the Project Area*

3.4 Site Ecological Importance

Based on the criteria provided in Appendix B of this report, all habitats within the Desktop PAOI and Project Area were assigned a sensitivity category, i.e., a SEI category. Project Area was categorised as possessing habitats with areas ranging from 'Very Low' to 'High' (Table 3-12). The Desktop PAOI was categorised as possessing habitats with areas ranging from 'Very Low' to 'High' SEI (Table 3-13).

The SEI of the Project Area is illustrated in Figure 3-13. The SEI of the Desktop PAOI is illustrated in Figure 3-14.

Table 3-12 *Summary of habitat types delineated within Project Area*

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor (RR)	Resilience	Site Ecological Importance (SEI)
Alluvial Vegetation, Central Free State Grassland, Central Free State Grassland (No Access) and Disturbed Central Free State Grassland	Medium	Medium	Medium	Medium	Medium	Medium
	> 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.		Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Low	Medium	Low	Medium		Low

D3 Energy Production Right

Degraded Grassland and Secondary Central Free State Grassland	< 50% of receptor contains natural habitat with limited potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.		Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
	Very Low	Very Low		High	Very Low
Modified	No natural habitat remaining.	Several major current negative ecological impacts.	Very Low	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.
	Medium	Medium		Low	High
Rocky Grassland	> 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
	Low	Medium		Medium	Low
Water Resources: Artificial; Drainage Channel, Artificial Wet Area and Dam	< 50% of receptor contains natural habitat with limited potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Low	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
	Medium	Medium		Medium	Medium
Water Resources: Depression	> 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Medium	High		Very Low	High
Water Resources: Sand River	> 50% of receptor contains natural	Only minor current negative ecological impacts, with no	High	Habitat that is unable to recover from major impacts, or species that	Avoidance mitigation wherever possible. Minimisation

D3 Energy Production Right

habitat with potential to support SCC.

signs of major past disturbance and good rehabilitation potential.

are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.

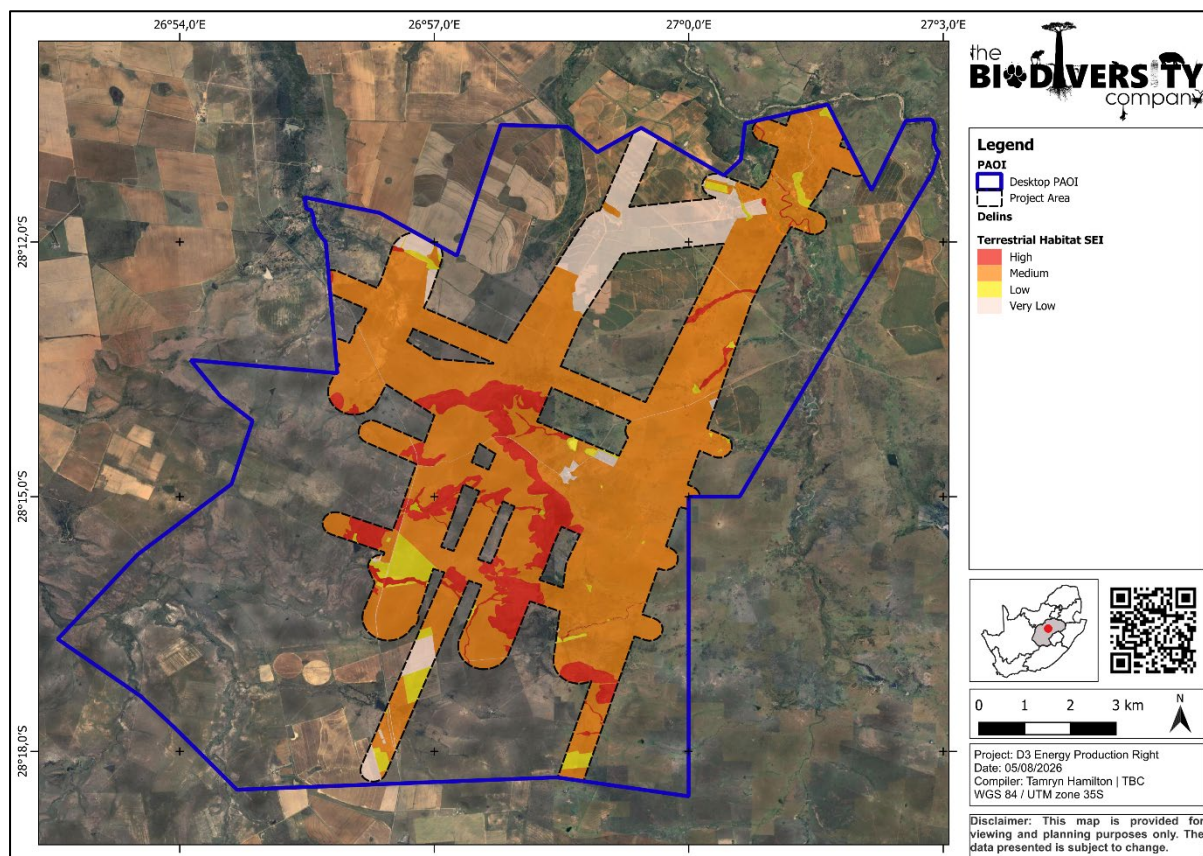


Figure 3-13 Site Ecological Importance of the Project Area

Table 3-13 Summary of habitat types delineated within Desktop PAOI.

Habitat Type	Conservation Importance (CI)	Functional Integrity (FI)	Biodiversity Importance (BI)	Receptor (RR)	Resilience	Site Ecological Importance (SEI)
Agriculture and Modified	Very Low	Very Low	Very Low	High	Very Low	
	No natural habitat remaining.	Several major current negative ecological impacts.		Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.	

D3 Energy Production Right

				impact has been removed.	
	Low	Medium		Medium	Low
Degraded Grassland and Fallow	< 50% of receptor contains natural habitat with limited potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Low	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
	Medium	Medium		Medium	Medium
Grasslands	> 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality.	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
	Medium	Medium		Low	High
Water Features	> 50% of receptor contains natural habitat with potential to support SCC.	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.	Medium	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality.	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.

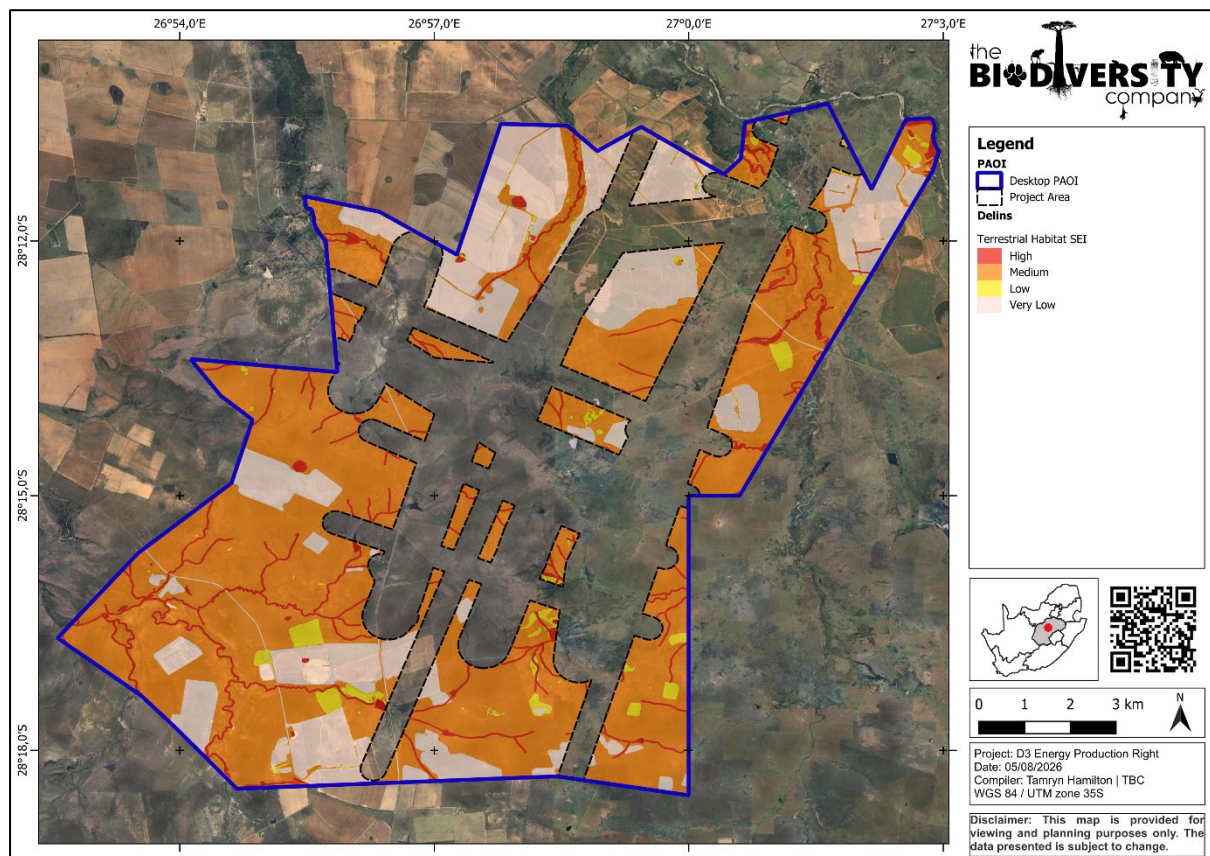


Figure 3-14 Site Ecological Importance of the Desktop PAOI

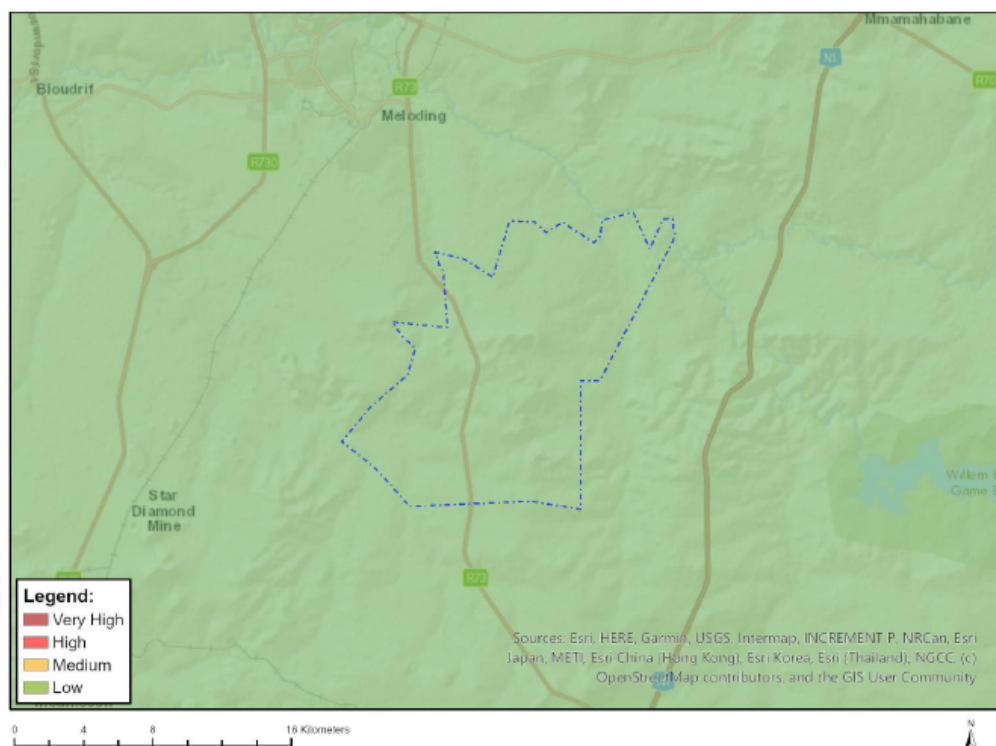
3.4.1 Desktop Ecological Sensitivity

According to the DFFE National Environmental Screening Tool Report generated (Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended), the following sensitivity classifications were gathered from the National Web-based Environmental Screening Tool:

- Terrestrial Biodiversity Theme sensitivity is Very High for the Desktop PAOI and Project Area, due to the area overlapping with CBA 1, CBA 2, ESA 1, ESA 2, FEPA Sub catchment, NPAES and Endangered Vaal-Vet Sandy Grassland Vegetation type, (Figure 3-15);
- Plant Species Theme sensitivity is Low for the Desktop PAOI and Project Area, with no sensitive species predicted to occurring within the Both study areas (Figure 3-16);
- Animal Species Theme sensitivity is Medium for the Desktop PAOI and Project Area, due to one (1) medium avifauna sensitive species and one (1) mammal sensitive species (Figure 3-17);

www.thebiodiversitycompany.com

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

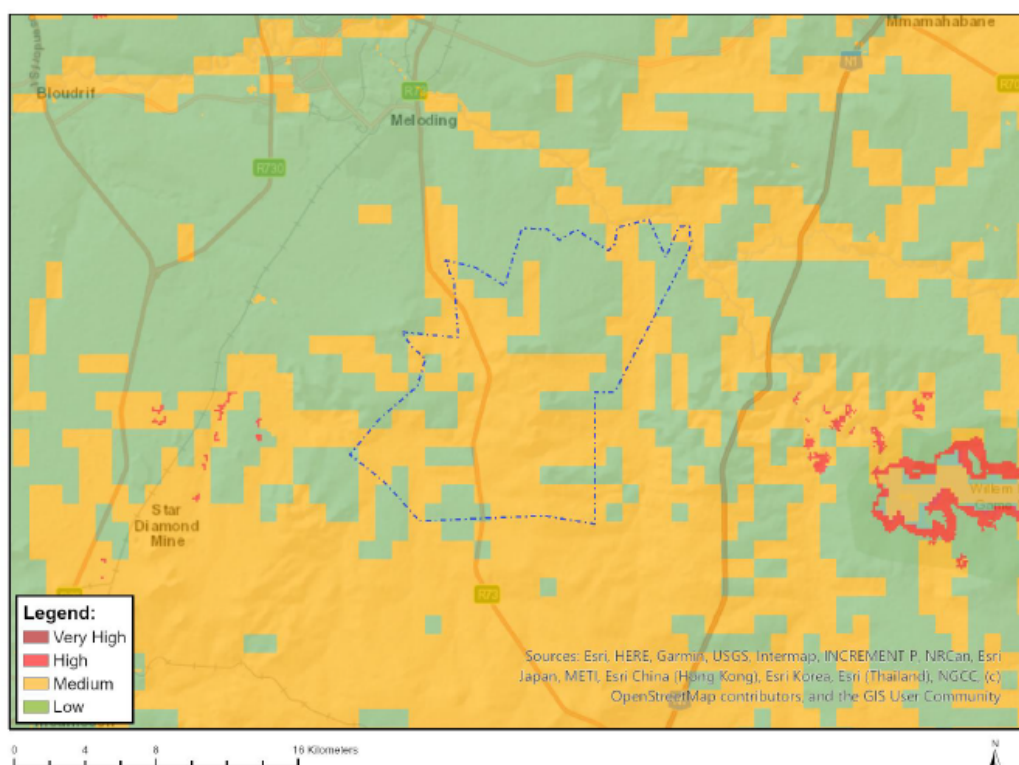
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 3-16 Map from DFFE National Environmental Screening Tool Report depicting the relative plant species theme sensitivity for the Desktop PAOI and Project Area.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Subject to confirmation
Medium	Aves-Hydroprogne caspia
Medium	Mammalia-Hydrictis maculicollis

Figure 3-17 Map from DFFE National Environmental Screening Tool Report depicting the relative animal species theme sensitivity for the Desktop PAOI and Project Area.

3.4.2 DFFE National Environmental Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated for the assessed **Project Area and Desktop PAOI**⁴. A summative explanation for each result is provided as relevant. The specialist-assigned sensitivity ratings are based largely on the SEI process followed in the previous section, and consideration is given to any observed or likely presence of SCC or protected species.

Table 3-14 Summary of the DFFE screening tool vs specialist assigned sensitivities for the Target areas.

DFFE National Environmental Screening Tool Theme	DFFE National Environmental Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	Medium	Alluvial Vegetation Central Free State Grassland Central Free State Grassland (No Access) Disturbed Central Free Rocky Grassland Winberg Grassy Shrubland Seep Sand River UVB CVB Depression	Medium	Validated –Fauna SCCs are unlikely to be resident here, although some may make use it for foraging and movement.
		Artificial Drainage Channel Artificial Wet Area Dam Secondary Central Free State Degraded Grassland Modified	Low	Disputed –No SCCs were recorded. Habitat is unlikely to support SCCs.
Plant Theme	Low	-	Low	Validated – No SCCs were recorded or are expected within the Seismic Transect.
Terrestrial Theme	Very High	Sand River Rocky Grassland Seep UVB CVB	High	Disputed – Considered semi-natural, although it has been disturbed by fragmentation, livestock grazing, and human encroachment.
		Alluvial Vegetation Central Free State Grassland Central Free State Grassland (No Access) Winberg Grassy Shrubland Disturbed Central Free State Depression	Medium	Disputed – Considered natural, although it has been disturbed by fragmentation, livestock grazing, and human encroachment, particularly in areas adjacent to roads.
		Degraded Grassland Secondary Central Free State Artificial Drainage Channel Artificial Wet Area Dam	Low	Disputed – Habitat modified in nature and currently and/or historically used for agricultural activities with limited potential to support SCC. Severe levels of disturbance present.
		Modified	Very Low	Disputed – Habitat modified in nature, predominantly made up of roads and infrastructure.

⁴ The Desktop PAOI cannot be compared due to no field coverage.

4 Impact Risk Assessment

4.1 Biodiversity Risk Assessment

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora, and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites and wildlife movement corridors, such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area.

Potential impacts were evaluated against the data captured during the desktop and field assessment to identify relevance to the PAOI. The relevant impacts associated with the proposed construction and operation of the development were then subjected to a prescribed impact assessment method. Impacts were assessed in terms of the construction and operational phases. The operational phase refers to that phase of the project where the construction has been completed. It should be noted that the impacts described are not exhaustive, and more impacts may be identified at a later stage. Mitigation measures were only applied to impacts deemed relevant based on the impact analysis.

Impacts were assessed for the following activities:

- Construction Phase;
- Operational Phase; and
- Closure Phase.

4.2 Present Impacts to Biodiversity

Considering the anthropogenic activities and influences within the landscape, several negative impacts to biodiversity were observed within the PAOI. These include:

- Edge effects associated with agricultural activities in the region;
- Human and vehicle ingress;
- Littering;
- Invasions by alien and invasive plants;
- Erosion;
- Grazing by livestock; and
- Linear infrastructure in the form of fences, roads and overhead powerlines.

4.3 Alternatives Considered

No alternatives were considered.

4.4 Irreplaceable Loss

The proposed activities will be conducted over the numerous habitats. These areas encompass indigenous vegetation that may be considered largely functional in nature and as such any irresponsible and/or medium to high impact activities will likely result in the loss of the following resources:

- CBA 1, CBA 2, ESA 1, ESA 2 and NPAES areas;
- Vaal-Vet Sandy Grassland (EN);
- Water resources;
- Potential fauna SCC;
- Potential protected species; and
- Indigenous vegetation.

4.5 Identification of Additional Potential Impacts

The following potential activities and potential impacts are expected. A summary of the potential impacts during the construction and operational phases of the proposed activity are presented in Table 4-1.

Table 4-1 *Summary of potential impacts to biodiversity associated with the proposed activity⁵*

Main Impact	Project Activities	Secondary Impacts Anticipated
Loss of indigenous habitat	• Direct loss as a result of proposed activities. • Secondary impacts associated with noise, dust and influx of AIPs into these areas. • Prevention of fires or incorrect fire regimes. • Improper solid waste disposal. • Dust precipitation. • Contamination and pollution of water resources in the area.	• Habitat fragmentation. • Loss of ecosystem services. • Emigration of fauna species, potentially including SCC. • Increased potential for soil erosion. • Habitat fragmentation. • Increased potential for establishment of alien invasive vegetation.
Encroachment of AIP species in disturbed areas.	• Vegetation removal. • Soil disturbance. • Vehicles potentially spreading seed. • Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive rodents.	• Habitat loss for native flora & fauna (including potential SCC). • Alteration of fauna assemblages due to habitat modification. • Reduced forage quality of grazing habitat. • Spreading of potentially dangerous diseases (e.g., Foot and Mouth Disease).
Direct mortality of fauna species.	• Clearing of vegetation. • Roadkill due to vehicle collision. • Preparation of soil with heavy machinery. • Soil excavations and soil transportation. • Intentional killing of fauna for food (hunting) or persecution (especially with regard to herpetofauna). • Pollution of water resources due to spilling of hazardous chemicals from heavy machinery during drilling and seismic activities. • Collisions of volant fauna with overhead powerlines.	• Loss of ecosystem services. • Explosion of rodent populations and associated disease risk.
Emigration of fauna	• Disturbance from drilling and seismic activities.	• Reduced population of protected species, and potentially SCC.

⁵ Text displayed in black indicates impacts associated with both drilling and seismic activities. Text displayed in green pertains only to impacts associated with drilling activities.

	Loss of habitat and degradation of surrounding habitats.	Loss of ecosystem services.
Reduced dispersal/migration of fauna	Removal of vegetation.	- Loss of ecosystem services. - Reduced plant seed dispersal.
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, light and dust	- Operation of machinery (generators, crushers, vehicles). - Vehicles operating at night. - Large, intense fluorescent and mercury vapor lighting.	Loss of ecosystem services.
Loss of SCCs and/or protected species	- All unregulated/unsupervised activities outdoors. - Poaching and trapping. - Staff and others interacting directly with fauna (potentially dangerous), or flora.	- Loss of SCC. - Harm to people (dangerous fauna).

4.6 Quantitative Impact Assessment

An impact assessment methodology was provided by EIMS to determine the environmental risk associated with various aspects related to the proposed activities. This impact assessment takes the following components into consideration.

- The nature of the associated impact (positive or negative);
- The extent of the proposed activities;
- The duration of the proposed activities;
- The magnitude of the effects caused by the proposed activities;
- The reversibility of associated impacts; and
- The probability of relevant aspects affecting sensitive receptors.

Each one of the above-mentioned components are given a rating, which cumulatively provides the specialist with a pre-mitigation environmental risk rating. These components are then scored again taking into consideration mitigating factors. The cumulative impact and irreplaceable loss to sensitive receptors are then scored to ultimately indicate a "Priority Factor" score.

The purpose of the impact assessment is to:

- Assess impacts of proposed activities on biodiversity of the proposed development area;
- Assess whether proposed activities are likely to have significant impacts on biodiversity and specifically species of conservation concern; and
- Identify practical, implementable mitigation measures to reduce the significance of proposed activities on biodiversity.

It is important to note that the ratings applied within the risk assessment model, considered impacts to open space or natural habitats within the development area and not for areas already transformed.

The impacts associated with the different phases of the project are discussed below and the assessment of the impacts can be seen in Table 4-2.. Mitigation measures are provided within and must be considered in conjunction with the mitigation measures provided by the Biodiversity Monitoring Plan in the existing EMPr as provided by EIMS [Amended Environmental Management Programme (EMPR), 2024].

These impacts should be considered in conjunction with the wetland and soil assessments as provided (TBC, 2026).

4.6.1 Construction/Operational Phase

The following potential impacts on the biodiversity were considered for the construction/operational phase of the project. Due to the nature of the project, only one phase of impacts is expected, and refers to the period during which the seismic studies are conducted. This phase usually has the largest direct impact on biodiversity. The following potential impacts to terrestrial biodiversity were considered.

4.6.1.1 Destruction, further loss and fragmentation of the vegetation community

Through potential site clearing, more of the vegetation communities will be lost. Unmitigated, this will also lead to habitat fragmentation and the establishment of alien invasive species as well as soil erosion.

Activities that will contribute to this impact:

- Driving/moving outside of designated areas;
- Physical removal of vegetation;

4.6.1.1.1 Temporary site establishment (laydown, chemical toilets, etc.);

- Soil dust precipitation as a result of site establishment;
- Dumping of waste products;
- Hydrocarbon storage and leakages; and
- Random events such as fire (cooking fires or cigarettes).

4.6.1.1.2 Cumulative Impacts

- Further loss of vegetation type

4.6.1.1.3 Irreplaceable Loss of Resources

- Loss of CBA/ESA;
- Loss of a threatened (EN) ecosystem;
- Loss of NPAES; and
- Loss of protected species.

4.6.1.2 Introduction of alien species, especially plants

The spread of alien and invasive species will result in the loss of habitat and water for indigenous fauna and flora. It can also contribute to the spreading of potentially dangerous diseases due to invasive - and pest species. Overall, the fauna and flora assemblage will be changed. Activities that will contribute to this impact:

- Vegetation removal and disturbance of soil;
- Vehicles potentially spreading seed;

- Unsanitary conditions surrounding infrastructure promoting the establishment of alien and/or invasive; and
- Eating area increasing pest species such as rats and flies.

4.6.1.2.1 Cumulative Impacts

- Loss of habitat for indigenous species; and
- Spread of disease to surrounding areas.

4.6.1.2.2 Irreplaceable Loss of Resources

- Loss of CBA/ESA;
- Loss of a threatened (EN) ecosystem;
- Loss of NPAES.

4.6.1.3 Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).

Faunal community will be influenced in a number of ways, including the loss of habitat, disturbances that will either make them move out of the area if possible or have to adapt and possible deaths due to physical harm or indirect harm. Activities that will contribute to this impact:

- Clearing of vegetation;
- Roadkill due to vehicle collision;
- Pollution of water resources due to dust effects and run-off;
- Intentional killing of fauna for food (hunting) or otherwise (killing of snakes);
- Disease caused by increased dust levels;
- Increase in pest species in the area due to new food source created; and
- Vibrations and noise due to the proposed activities.

4.6.1.3.1 Cumulative Impacts

- Loss of habitat for indigenous species.

4.6.1.3.2 Irreplaceable Loss of Resources

- Loss of fauna SCCs.

4.6.1.4 Leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment.

Hydrocarbons leaching into the surrounding area will result in the loss of usable water resources, the loss of fauna and flora species. This will also result in the contamination of the topsoil and reduce the likelihood of successful rehabilitation of an area.

Activities that will contribute to this impact:

- Loss of vegetation; and
- Loss of topsoil.

4.6.1.4.1 Cumulative Impacts

- Loss of usable water resources for fauna species; and
- Loss of viable habitat.

4.6.1.4.2 Irreplaceable Loss of Resources

- Loss of usable water resources for fauna species resulting in loss of SCC and other species.

4.6.2 Closure Phase

This phase will initially involve the rehabilitation of any cleared/disturbed areas, seismic studies have been completed.

4.6.2.1 Continued encroachment of an indigenous and vegetation community by alien invasive plant species as well as erosion due to disturbed soils

The spread of alien invasive species will result in the loss of habitat and water for indigenous fauna and flora. Overall, the fauna assemblage will be changed. Erosion will also disrupt the vegetation in the surrounding areas and result in habitat loss. Activities that will contribute to this impact:

- Vehicles potentially spreading seed.

4.6.2.1.1 Cumulative Impacts

- Loss of habitat; and
- Loss of indigenous flora species due to competition.

4.6.2.1.2 Irreplaceable Loss of Resources

- Loss of habitat and food sources for Fauna SCCs.

4.6.2.2 Continued displacement and fragmentation of the faunal community (including threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).

- Habitat loss; and
- The disruption of natural faunal movement corridors.

4.6.2.2.1 Cumulative Impacts

- Loss of suitable habitat.

4.6.2.2.2 Irreplaceable Loss of Resources

- Loss of faunal SCCs.

4.7 No-Go Scenario

The current land use is predominantly agriculture and livestock grazing and the associated impacts caused by this to the terrestrial ecology is considered to be medium. If the land use is well managed, then the long-term impacts to the local ecology will continue to be low - this will require that grazing areas are rotated, grazing capacities are sustained, and stocking densities are controlled. Under the current circumstances, the 'no-go' alternative is considered to represent a low-medium long-term negative impact on the environment. However, it is noted that if the current land uses are left unmanaged for the foreseeable future, it is probable that the ecological integrity and functioning of the grassland area will deteriorate. Mitigation measures in blue are new and project specific.

Table 4-2 Assessment of significance of impacts on the terrestrial fauna and flora associated with the project⁶

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
Construction/Operational Phase								
4.6.1.1.	Destruction, further loss and fragmentation of the vegetation community	-13	-5.25	High	1	1	1.00	-5.25
Mitigation	Drilling-Specific Mitigations	- Minimise vegetation clearance. Existing gravel roads must be used as far as possible, and the closest disturbed areas must be considered for drill pads. Clearance of vegetation must be kept to the required footprint (i.e. 50 x 50 m drill pad). Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed. A vegetation clearance management plan should be compiled prior commencement of activities which at minimum should state how the minimisation with be managed based on the affected environmental aspect or phase of the production. - Demarcate the exact area to be cleared before work starts. - Use existing gravel roads for drill pad access. - Appointed Environmental Officer (EO) or Environmental Compliance Officer (ECO) needs to review final drill locations before any drilling activities can proceed.						
	Seismic-Specific Mitigations	- Transects via 2 track roads over the surface are acceptable within High SEI areas. - Demarcate sensitive areas for seismic transects. - Use existing roads for seismic access. - No clearing of vegetation.						
	Mitigations for Both Activities (Shared)	- All activities must be restricted within the Very Low-Medium sensitivity areas as much as possible. No further loss of high sensitivity areas and associated buffers should be permitted. - No seismic activities nor drilling activities are to be permitted within on wetlands or watercourses (32 m pre-mitigation and a 15 m post-mitigation buffer). - Areas rated as High sensitivity outside of the direct construction / production areas should be declared as 'no-go' areas during the life of the project, and all efforts must be made to prevent impacts and access to these areas from construction workers and machinery. - Workforce should be kept within defined boundaries ad to agreed access routes. - Avoidance or relocation of protected species. - All laydown, chemical toilets etc. should be restricted to low / medium sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction / production phase has been concluded. - Minimise physical footprint of construction. Construction / production impacts associated with the proposed project must be contained within the footprint of the assessed areas. - A fire action plan needs to be complied and implemented to restrict the impact unplanned fires might have on the surrounding areas. - A suitable qualified EO or ECO must be appointed prior to the construction phase. If the final seismic transect route and/or the drilling location changes from the currently proposed areas, but within the assessed footprint and is situated within the High sensitive area, the EO / ECO must undertake final walkdown along the final planned transect route/s and drilling locations in order to ensure that no sensitive vegetation or floral/fauna SCC (more specifically Sensitive Species 15) are to be impacted.						

⁶ Text in blue indicates new mitigation measures to be added to the existing EMP.

D3 Energy Production Right

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
4.6.1.2.	Introduction of alien species, especially plants	-12	-3.5	High	1	1	1.00	-3.50
Mitigation	Drilling-Specific Mitigations	- Compile and Implement alien vegetation management plan due to Category 1b Alien Species on site. - Waste generated on site must be recycled as far as possible. Recyclable waste must not be stored on site for excessive periods to reduce the risk of environmental contamination. Examples of recyclable waste include office paper, newspapers, magazines, cardboard boxes, paper packaging, plastic bottles, and plastic bags. - A Waste Management System must be implemented and provide for adequate waste storage (in the form of enclosed containers) waste separation for recycling, and frequent removal of non-recyclable waste for permanent disposal at an appropriately licensed waste disposal facility. - No waste material is to be disposed of on site.						
	Seismic-Specific Mitigations							
4.6.1.3.	Displacement of faunal community (including SSCs) due to habitat loss, direct mortalities and disturbance (road collisions, noise, light, dust, vibration and poaching).	-14	-6	Medium	1	1	1.00	-6.00
Mitigation	Drilling-Specific Mitigations	- Where possible, work should be restricted to one area at a time and be systematic. This is to reduce the number and extent of on-site activities, allowing fauna to move off as the Project progresses. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories. - Prior to commencing work each day, two individuals should traverse the working area in order to scare away any fauna within the seismic or drilling area, promoting temporary fauna migration from direct line of impact. - Any holes/deep excavations must be done in a progressive manner on a need only basis. Minimal holes/excavations may be left open overnight. In the event holes/excavations are required to remain open overnight, these areas must be covered to prevent fauna falling into these areas and subsequently inspected prior to backfilling. - Limit vehicle access. - Speed restriction of no more than 20km/h must be implemented for all construction vehicles within the construction site. - The contractor must attempt to restrict noisy activities as far as is possible to times and locations whereby the potential for noise nuisance is reduced. Noise producing activities should be limited to day-time after 07h00 and 17h00 on week days. - Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions. - Ongoing identification of risks and impacts. - All contractors and employees should have form of identification. This measure ensures that only authorised personnel access sensitive ecological areas, thereby reducing the risk of disturbance to fauna SCC (more specifically Sensitive Species 15). - Vehicles should be clearly marked as construction vehicles. - There must be access control to the entry / exit points of the exploration and production sites.						
	Seismic-Specific Mitigations							
4.6.1.4.	Potential leaks, discharges, pollutant from machinery and storage leaching into the surrounding environment.	-14	-4	High	1	1	1.00	-4.00
Mitigation	Drilling-Specific Mitigations	Any equipment that may leak, and does not have to be transported regularly, must be placed on watertight drips trays to catch any potential spillages of pollutants. The drip trays must be of a size that the equipment can be placed inside it.						
	Seismic-Specific Mitigations							

D3 Energy Production Right

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
		- Drip trays must be cleaned regularly and shall not be allowed to overflow. All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility. - All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner so as to prevent pollution of the environment or harm to people or animals. Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill. - Hazardous substances must be confined to specific and secured areas, and in such a way that does not pose any danger of pollution even during times of high rainfall. - Refuelling may only take place within demarcated areas that is subject to appropriate spill prevention and containment measures refuelling and transfer of hazardous chemicals and other potentially hazardous substances must be carried out so as to minimize the potential for leakage and to prevent spillage onto the soil. - Drip trays should be utilised in relevant locations (inlets, outlets, points of leakage, etc.) during transfer so as to prevent such spillage or leakage. Any accidental spillages must be contained and cleaned up promptly. - Trucks, machinery and equipment must be regularly serviced to ensure they are in proper working condition and to reduce risk of leaks. All leaks must be cleaned up immediately using spill kits or as per the emergency response plan. For large spills a hazardous materials specialist shall be utilised. - Accidental hydrocarbon spillages must be reported immediately to the ECO and DWS, and the affected soil should be removed, and rehabilitated or if this is not possible, disposed of at a suitably licenced waste disposal facility.						
Rehab and Closure								
4.6.2.1.	Continued encroachment of an indigenous and vegetation community by alien invasive plant species as well as erosion due to disturbed soils	-9.75	3.5	Medium	2	2	1.25	4.38
Mitigation	Drilling-Specific Mitigations	- Rehabilitation of the disturbed areas must be made a priority. Any disturbed area must be re-habilitated to its pre-disturbed state as defined in the pre-drill survey. Disturbed areas must be rehabilitated to support its post-closure land use, and this must be undertaken within six (6) months post drilling activities. - All debris and contaminated soils must be removed and suitably disposed of. - Contours and natural surrounding must be reformed. - All equipment, fencing and other infrastructure must be removed from site once activities are complete. - Natural drainage patterns must be restored. - The stockpiled topsoil must be returned to the surface of the reinstated areas. For topsoil's with highly enriched seedbanks, additional seeding may not be required, but this would need to be monitored over time. If necessary, seed from the surrounding areas should be used to augment the topsoil seedbank. - During and after rehabilitation, ensure that all water ways or areas where storm water naturally flowed are open and free of any impediment. - Temporary access routes/roads must be suitably rehabilitated. - Sites must be monitored by the ECO (including relevant specialist's inputs if necessary) for adequate rehabilitation until the desired rehabilitation objectives have been achieved.						
	Seismic-Specific Mitigations							
4.6.2.2.	Continued displacement and fragmentation of the faunal community (including	-9.75	3.5	Medium	2	2	1.25	4.38

D3 Energy Production Right

Identifier	Impact	Pre-mitigation ER	Post-mitigation ER	Confidence	Cumulative Impact	Irreplaceable loss	Priority Factor	Final score
	threatened or protected species) due to ongoing anthropogenic disturbances (noise, dust and vibrations) and habitat degradation/loss (litter, road mortalities and/or poaching).							
Mitigation	Drilling-Specific Mitigations	- The post-operational monitoring and management period following decommissioning of production activities must be implemented by a suitable qualified independent party for a minimum of one (1) year unless otherwise specified by the competent authority. The monitoring activities during this period must include but not be limited to: Biodiversity monitoring and Re-vegetation of disturbed areas where required. - Provision must be made to monitor any unforeseen impact that may arise as a result of the proposed production activities and incorporated into post closure monitoring and management. - No excavations should be left open. - Limiting the closure and rehabilitation activities to the footprint areas only. Avoid entry/access to previously undisturbed or already rehabilitated areas.						
	Seismic-Specific Mitigations							

5 Conclusion

The project area has experienced changes both currently and historically. Nine (9) major habitats have been identified of which one (1) is considered non – terrestrial. Habitats identified include Alluvial Vegetation (Medium SEI), Central Free State Grassland including Central Free State Grassland (Medium SEI), Degraded Grassland (Low SEI), Winberg Grassy Shrubland (Medium SEI), Modified (Very Low SEI), Secondary Central Free State (Low SEI), Rocky Grassland (High SEI), Disturbed Central Free State Grassland (Medium SEI) and non – terrestrial Water Resources (Low to High SEI).

Nine (9) provincially protected species [*Ammocharis coranica* (Berg Lily), *Anacampseros papyracea* (Karoo Gansmis), *Anacampseros subnuda subnuda*, *Boophone disticha* (Bushman Poison Bulb), *Eucomis autumnalis* (Pineapple Lily), *Euphorbia clavarioides* (Lion's Spoor), *Gladiolus permeabilis edulis*, *Helichrysum nudifolium* (Hairy Everlasting) and *Helichrysum zeyheri* (Vaalbergkaroo)]. These species were recorded within all habitats apart from the Modified habitat type. Therefore, a site walkdown to record provincially protected species for all target areas must be conducted prior to Seismic survey. No fauna SCC were observed; however suitable habitat is found within the project area.

The Desktop PAOI was identified by the DFFE National Environmental Screening Tool as possessing a 'Very High' sensitivity within a Terrestrial Biodiversity theme. However, the Desktop PAOI was assessed to have varying sensitivities, as detailed in section 3.4.2. Specifically, the Sand River, Rocky Grassland, Seep, UVB, and CVB areas are classified as High sensitivity. Alluvial Vegetation Central Free State Grassland, Central Free State Grassland (No Access), Windberg Grassy Shrubland, Disturbed Central Free State, and Depression areas are classified as Medium sensitivity. Degraded Grassland, Secondary Central Free State, and Artificial Drainage Channel areas are classified as Low sensitivity. The Plant sensitivity is classified as Low according to the DFFE National Environmental Screening Tool and was validated during the assessment. The Animal sensitivity is classified as Medium according to the DFFE National Environmental Screening Tool and was validated for seven (7) habitat units and disputed as being Low for four (4) habitat units as seen in section 3.4.2.

According to the Free State Biodiversity Plan (2015), the Project Area overlaps with areas classified as Critical Biodiversity Areas (CBA 1: Irreplaceable and CBA 2: Optimal) as well as Ecological Support Areas (ESA 1: Functional and ESA 2: Degraded) (see Figure 5-1). Consultation with regulating authorities is strongly recommended for any seismic activities within the Project Area, especially where these intersect with sensitive biodiversity areas. In particular, such consultation is essential for any activities within Critical Biodiversity Areas and threatened ecosystems to ensure compliance with biodiversity conservation requirements. The impacts of the proposed seismic activities within High SEI areas are anticipated to be short-term, with good rehabilitation potential, and it is assumed that these areas can be restored to their pre-seismic condition with appropriate mitigation measures.

The ecological integrity, importance and functioning of these habitats play a crucial role and an important habitat for various fauna and flora. The preservation of these systems is the most important aspect to consider for the proposed project. These habitats need to be protected and improved due to the role they play in a fragmented landscape.

Table 5-1 illustrate the habitats, condition, SE.

Table 5-1 *Summary of Habitat Units, Condition, Sensitivity, Biodiversity Spatial Planning Categories, and Development Potential for the D3 Energy Production Right Project Area*

Habitat	Condition	SEI	Free State Biodiversity Spatial Plan	Developability
Modified	Irreversibly and Severely Modified	Very Low	CBA 2, ESA 2, ONA, Degraded Areas	Mitigated development permitted, with concurrent rehabilitation
Alluvial Vegetation	Disturbed	Medium	ESA 1, ESA 2	Mitigated development permitted, with concurrent rehabilitation
Central Free State Grassland and Central Free State Grassland (No Access)	Semi-natural and Disturbed	Medium	ESA 1, ESA 2	Mitigated development permitted, with concurrent rehabilitation
Degraded Grassland	Degraded	Low	CBA 1, CBA 2, ESA 1, ESA 2, Degrade Areas	Mitigated development permitted, with concurrent rehabilitation
Winberg Grassy Shrubland	Semi-natural	Medium	CBA 2, ESA 1, ESA 2, ONA	Mitigated development permitted, with concurrent rehabilitation
Secondary Free Central State Grassland	Disturbed	Low	ESA 1, ESA 2	Mitigated development permitted, with concurrent rehabilitation
Rocky Grassland	Intact	High	CBA 2, ESA 1, ONA	Low-impact development permitted, with concurrent rehabilitation.
Water Resources	Artificial, Disturbed and Natural	Low to High		See wetland assessment (TBC, 2026)

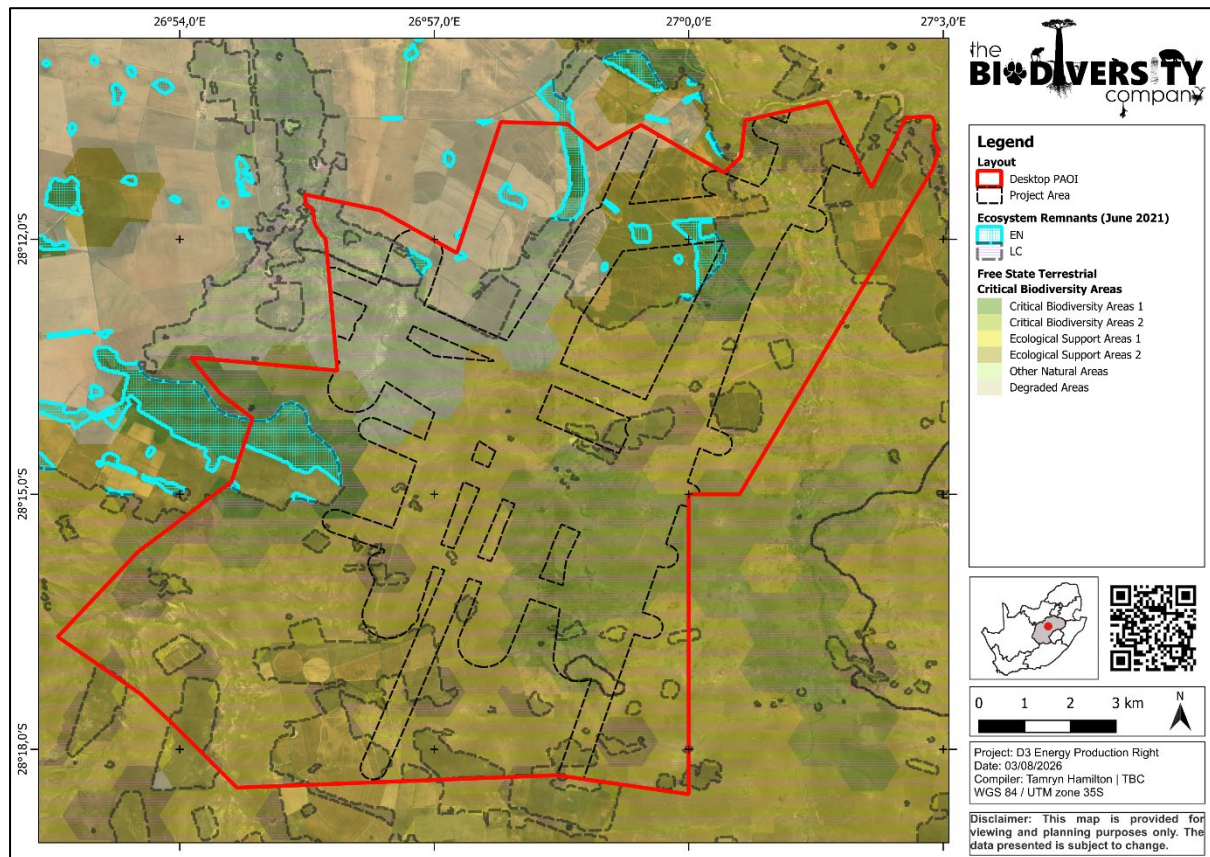


Figure 5-1 Map illustrating the PAOI in relation to the Free State Biodiversity Spatial Plan and Remnants dataset

5.1 Impact Statement

No fatal flaws were identified for the project. The overall residual impact of the production project is expected to be low. It is the opinion of the specialist that the proposed seismic activities are favourable for authorisation provided the mitigation measures outlined in this report are implemented correctly. The Competent Authority must consider all mitigation measures provided in this report and other specialist reports. The overall low cumulative residual impact does not present a fatal flaw for the development, and in accordance with the Biodiversity Offset Guideline (2023) will not incur a listed (and notable) change to the land and resource.

5.2 Specialist Opinion

There are areas within the Project Area that possess a High SEI. This denotes that avoidance mitigation wherever possible must be implemented. This includes changes to project infrastructure design and activity to limit the amount of habitat impacted.

The following should be considered for the Desktop PAOI and Project Area:

- 1) A site walkdown must be conducted prior to development activities to search for potential fauna SCC, in particular *Sensitive Species 15* in case it occurs on the region; and
- 2) Mitigations pertaining to Water Resource habitats must be implemented in accordance with the Wetland Assessment (TBC, 2026).

6 References

Apps, P. 2000. *Smither's Mammals of Southern Africa – A Field Guide*. Struik Nature, Cape Town.

Bates, M.F., Branch, W.R., Bauer, A.M., Burger, M., Marais, J., Alexander, G.J & de Villiers, M.S. (Eds). 2014. *Atlas and Red List of Reptiles of South Africa, Lesotho and Swaziland. Suricata 1*. South African Biodiversity Institute, Pretoria.

Branch, B. 1998. *Field Guide to Snakes and Other Reptiles of Southern Africa*. Struik Nature, Cape Town.

Department of Forestry, Fisheries and the Environment (DFFE). 2023. SACAD (South Africa Conservation Areas Database) and SAPAD (South Africa Protected Areas Database). <http://egis.environment.gov.za>.

Department of Forestry, Fisheries and the Environment (DFFE). 2022. National Protected Areas Expansion Strategy <http://egis.environment.gov.za>.

Du Preez, L.H. & Carruthers, V. 2009. *A Complete Guide to the Frogs of Southern Africa*. Struik Nature, Cape Town.

EIMS. 2024 Amended Environmental Management Programme (EMPR). Randburg.

Fish, L., Mashau, A.C., Moeaha, M.J. & Nembudani, M.T. 2015. *Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions*. SANBI, Pretoria.

FitzPatrick Institute of African Ornithology. 2024a. MammalMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=MammalMAP>

FitzPatrick Institute of African Ornithology. 2024b. ReptileMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=ReptileMAP>

FitzPatrick Institute of African Ornithology. 2024c. FrogMAP Virtual Museum. Accessed at <http://vmus.adu.org.za/?vm=FrogMAP>

Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19*. South African National Biodiversity Institute, Pretoria, South African.

Mucina, L., Rutherford, M.C. & Powrie, L.W. (Eds.). 2007. *Vegetation map of South Africa, Lesotho and Swaziland. 1:1 000 000 scale sheet maps. 2nd ed.* South African National Biodiversity Institute, Pretoria.

Mucina, L., Scott-Shaw, C.R., Rutherford, M.C., Camp, K.G.T., Matthews, W.S., Powrie, L.W. and Hoare, D.B. *Indian Ocean Coastal Belt*. IN Mucina, L. & Rutherford, M.C. (Eds.). 2006. *The vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19*. South African National Biodiversity Institute, Pretoria, South African.

National Biodiversity Assessment spatial data. 2018. <http://bgis.sanbi.org/>. Accessed January 2022.

Nel JL, Murray KM, Maherry AM, Petersen CP, Roux DJ, Driver A, Hill L, Van Deventer H, Funke N, Swartz ER, Smith-Adao LB, Mbona N, Downsborough L and Nienaber S. 2011. Technical Report for the National Freshwater Ecosystem Priority Areas project. WRC Report No. K5/1801.

NEMBA. 2014. Government Gazette, Volume 584. No 37320. www.gpwonline.co.za. Accessed January 2022.

POSA. 2016. Plants of South Africa - an online checklist. POSA ver. 3.0. <http://newposa.sanbi.org/>. (Accessed: August 2023).

Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. and Manyama, P.A. 2009. *Red List of South African Plants. Strelitzia 25*. South African National Biodiversity Institute, Pretoria.

SANBI. 2022. Red List of South African Plants version 2020. redlist.sanbi.org (Accessed: May 2023)

SANBI-BGIS. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning.

SAPAD (South Africa Protected Areas Database) and SACAD (South Africa Conservation Areas Database) (2023). <http://egis.environment.gov.za>

D3 Energy Production Right

-
- Skinner, J.D. & Chimimba, C.T. 2005. The Mammals of the Southern African Sub-region. Cambridge University Press, Cape Town.
-
- Skowno, A.L. & Monyeke, M.S. 2021. South Africa's Red List of Terrestrial Ecosystems (RLEs). *Land*, 10, 1048, 1-14.
-
- Skowno, A.L., Raimondo, D.C., Poole, C.J., Fizzotti, B. & Slingsby, J.A. (eds.). 2019. South African National Biodiversity Assessment 2018 Technical Report Volume 1: Terrestrial Realm. South African National Biodiversity Institute, Pretoria.
-
- Stuart, C & Stuart, M. A. 2013. Field guide to the tracks & signs of Southern, Central & East African Wildlife. Penguin Random House, Cape Town.
-
- Stuart, C & Stuart, M. A. 2015. Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi. Struik Nature, Cape Town.
-
- Taylor A, Cowell C, Drouilly M, Schulze E, Avenant N, Birss C, Child MF. 2016. A conservation assessment of *Pelea capreolus*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.
-
- Taylor, M.R., Peacock, F. & Wanless, R.M. (Eds). 2015. The 2015 Eskom Red Data Book of birds of South Africa, Lesotho and Swaziland. BirdLife South Africa, Johannesburg.
-
- Van Deventer H, Smith-Adao L, Collins NB, Grenfell M, Grundling A, Grundling P-L, Impson D, Job N, Lötter M, Ollis D, Petersen C, Scherman P, Sieben E, Shaddon K, Terera F. and Van der Colff D. 2019. *South African National Biodiversity Assessment 2018: Technical Report*. Volume 2b: Inland Aquatic (Freshwater) Realm. CSIR report number CSIR/NRE/ECOS/IR/2019/0004/A. South African National Biodiversity Institute, Pretoria. <http://hdl.handle.net/20.500.12143/6230>.
-

7 Appendix Items

7.1 Appendix A: Methods

7.1.1 Desktop Dataset Assessment

7.1.1.1 Ecologically Important Landscape Features

Existing ecologically relevant data layers were incorporated into a GIS to establish how the proposed development might interact with any ecologically important entities. Emphasis was placed around the following spatial datasets:

- National Biodiversity Assessment 2018 (Skowno *et al*, 2019) - The purpose of the National Biodiversity Assessment (NBA) is to assess the state of South Africa's biodiversity based on best available science, with a view to understanding trends over time and informing policy and decision-making across a range of sectors. The NBA deals with all three components of biodiversity: genes, species and ecosystems; and assesses biodiversity and ecosystems across terrestrial, freshwater, estuarine and marine environments. The two headline indicators assessed in the NBA are:
 - Red List of Ecosystems (RLE) 2021 – The list was first published in 2011 and has since been substantially revised by authors Dr Andrew Skowno and Mrs Maphale Monyeki (SANBI, 2022). This list is based on assessments that followed the International Union for Conservation of Nature (IUCN) Red List of Ecosystems Framework (version 1.1) and covers all 456 terrestrial ecosystem types described in South Africa by Mucina and Rutherford (2006). A total of 120 of the 456 terrestrial ecosystem types assessed are categorised as threatened and together make up approximately 10% of the remaining natural habitat in the country. Of these 120 ecosystem types, 55 are Critically Endangered (CR), 51 Endangered (EN) and 14 are Vulnerable (VU). The remainder are categorised as Least Concern (LC) (SANBI, 2022; Skowno & Monyeki, 2021).
- Ecosystem Protection Level – indicator of the extent to which ecosystems are adequately protected or under-protected. Ecosystem types are categorised as Well Protected (WP), Moderately Protected (MP), Poorly Protected (PP), or Not Protected (NP), based on the proportion of the biodiversity target for each ecosystem type that is included within one or more protected areas. Not Protected, Poorly Protected or Moderately Protected ecosystem types are collectively referred to as under-protected ecosystems.
- Protected areas:
 - South Africa Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) (DFFE, 2023a) – The South African Protected Areas Database (SAPAD) and South Africa Conservation Areas Database (SACAD) contains spatial data for the conservation of South Africa. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. The database is updated on a continuous basis and forms the basis for the Register of Protected Areas which is a legislative requirement under the National Environmental Management: Protected Areas Act, Act 57 of 2003.
 - National Protected Areas Expansion Strategy (NPAES) (DFFE, 2022b) – The National Protected Area Expansion Strategy (NPAES) provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and are therefore, of high importance for biodiversity, climate resilience and freshwater protection.

- Conservation/Biodiversity Sector Plans:

The Free State Biodiversity Plan (DESTEA, 2015) – A key objective of the Free State Provincial Spatial Development Plan is to integrate and standardize planning at all spheres of government in the province with specific reference to amongst others facilitating land-use classification of the entire land surface of the province. To this extent a set of dedicated Spatial Planning Categories (SPCs) were developed which provide a spatial framework to guide decision-making regarding land-use at all levels of planning. The SPCs represent a classification system that indicates the most suitable, or a range of, land use options for a certain piece of land. Associated with each SPC category is land use guidelines which when implemented ensures a balance between development and conservation. Mainstreaming of the biodiversity plan into spatial planning process will be achieved by aligning the biodiversity plan categories with those of the SPCs so that planning according to SPC will then automatically also adopt the biodiversity plan categories and their associated land use guidelines.

- Important Bird and Biodiversity Areas (BirdLife South Africa, 2015) – Important Bird and Biodiversity Areas (IBAs) constitute a global network of over 13 500 sites, of which 112 sites are found in South Africa. IBAs are sites of global significance for bird conservation, identified through multi-stakeholder processes using globally standardised, quantitative and scientifically agreed criteria; and
- Freshwater Ecology:
 - Strategic Water Source Areas (SWSAs) (Le Maitre *et al*, 2018) – SWSAs are defined as areas of land that supply a quantity of mean annual surface water runoff in relation to their size and therefore, contribute considerably to the overall water supply of the country. These are key ecological infrastructure assets and the effective protection of surface water SWSAs areas is vital for national security because a lack of water security will compromise national security and human wellbeing.
 - South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al*, 2018) – A South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was established during the National Biodiversity Assessment of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types as well as pressures on these systems.
 - National Freshwater Ecosystem Priority Area (NFEPA) (Nel *et al.*, 2011) – The NFEPA database provides strategic spatial priorities for conserving the country's freshwater ecosystems and associated biodiversity as well as supporting sustainable use of water resources.

7.1.2 Desktop Flora Assessment

The desktop flora assessment encompassed an assessment of all the vegetation units and habitat types within the PAOI, as well as the identification of expected plant species and any locally occurring flora SCC.

The Vegetation of South Africa, Lesotho, and Swaziland (Mucina & Rutherford, 2006) and the 2018 Terrestrial & Freshwater Assessment by SANBI (2018) was used to identify the vegetation types that would have occurred under natural or pre-anthropogenically altered conditions. Furthermore, the iNaturalist database was accessed to compile a list of expected flora species within the PAOI (Figure 7-1). The Red List of South African Plants website (SANBI, 2016) was used to provide the most current account of the national conservation status of flora.

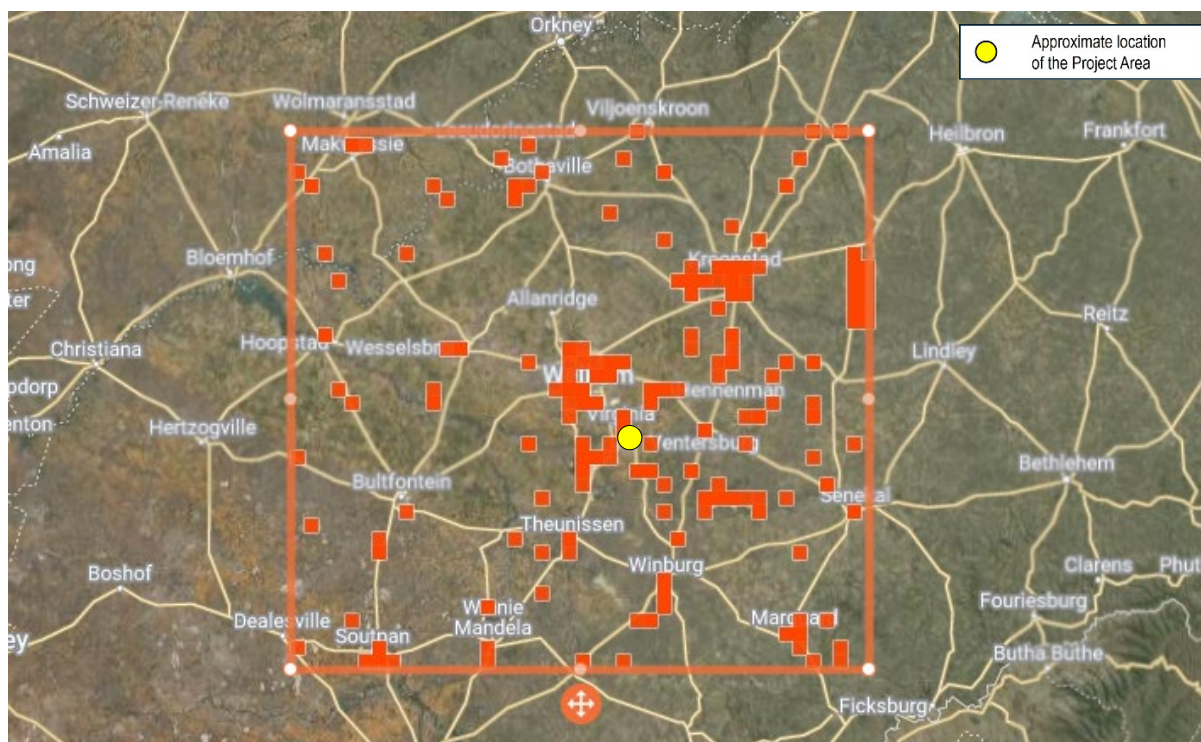


Figure 7-1 Map illustrating extent of area used to obtain the expected flora species list from the iNaturalist database. The yellow dots indicate the approximate location of the PAOI

The latest information regarding provincially, and nationally protected flora was obtained from the following published legislative sources:

- Provincially Protected Plant Species (Schedule 6 of the Free State Nature Conservation Ordinance 8 of 1969);
- Nationally Protected plant species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004); and
- List of Nationally Protected Tree Species (DFFE, 2022).

7.1.3 Desktop Fauna Assessment

The non-volant faunal desktop assessment comprised of the following:

- Compiling an expected amphibian list generated from the FrogMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024a) using the 2726DA, 2726DC and 2826BD quarter degree square;
- Compiling an expected reptile list generated from the ReptileMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024b) using the 2726DA, 2726DC and 2826BD quarter degree square;
- Compiling an expected mammal list generated from the MammalMap database of the Animal Demography Unit (Fitzpatrick Institute of African Ornithology, 2024c) using the 2726DA, 2726DC and 2826BD quarter degree square; and

- Avifauna list from the Southern African Bird Atlas Project 2 (SABAP2). The Avifauna list was generated from the SABAP2 dataset by looking at pentads 2745_2650, 2745_2655, 2745_2700, 2750_2650, 2750_2655, 2750_2700, 2750_2705, 2755_2645, 2755_2650, 2755_2655, 2755_2700, 2755_2705, 2755_2710, 2800_2650, 2800_2655, 2800_2700, 2800_2705, 2800_2710, 2805_2655, 2805_2700, 2810_2650, 2810_2655, 2740_2645, 2745_2645, 2750_2645, 2740_2650, 2740_2655, 2740_2700, 2740_2705, 2745_2705, 2745_2710, 2750_2710, 2750_2640, 2755_2640, 2800_2640, 2800_2645, 2750_2715, 2755_2715, 2800_2715, 2805_2645, 2805_2650, 2805_2705, 2805_2710, 2805_2715, 2810_2700, 2810_2705, 2810_2645, 2815_2645, 2815_2650, 2815_2655, 2815_2700.

South Africa's official site for Species Information and National Red Lists (SANBI, 2022) was used to provide the most current national Red-List status of fauna. The latest information regarding provincially, and nationally protected fauna was obtained from the following published legislative lists:

- Provincially Protected Wildlife Species (Schedule 1 of the Free State Nature Conservation Ordinance 8 of 1969); and
- Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004).

7.1.4 Vegetation & Flora Survey

The wet season fieldwork and sample sites were placed within Project Area (i.e., target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery (Google Corporation) and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork. The focus of the fieldwork was, therefore, to maximise coverage and navigate to each target site in the field in order to perform a rapid vegetation and ecological assessment at each sample site.

Homogenous vegetation units were subjectively identified using satellite imagery and existing land cover maps (confirmed during the field survey). The floristic diversity and search for protected plants and flora SCC were conducted through timed meanders within representative habitat units delineated during the desktop assessment. Emphasis was placed on sensitive habitats, especially those overlapping with the PAOI.

The timed random meander method is a highly efficient method for conducting floristic analysis, specifically in detecting protected plants and flora SCC and maximising floristic coverage. In addition, the method is time and cost effective and highly suited for compiling observed flora species lists and therefore gives a rapid indication of flora diversity. The timed meander search was performed based on the original technique described by Goff et al. (1982). Suitable habitat for SCC was identified according to Raimondo et al. (2009) and targeted as part of the timed meanders.

At each sample site notes were made regarding current impacts (e.g., roads, erosion etc.), and this included the subjective recording of dominant vegetation species and any sensitive features (e.g., wetlands, rock outcrops etc.). In addition, opportunistic observations were made while navigating through the area.

Species were identified in field wherever possible. If they could not be identified in the field, field guides and texts were used. Relevant field guides and texts consulted for identification purposes included, but was not limited, to the following:

- Identification Guide to Southern African Grasses: An Identification Manual with Keys, Descriptions, and Distributions (Fish *et al.*, 2015);

- A Field Guide to Wild Flowers (Pooley, 1998);
- Problem Plants and Alien Weeds of South Africa (Bromilow, 2018);
- Field Guide to Succulents in Southern Africa (Smith *et al.*, 2017);
- Field Guide to Wildflowers of South Africa (Manning, 2009); and
- iNaturalist. Available at <https://www.inaturalist.org/home>

7.1.4.1 Fauna Survey

The faunal component of this report pertains only to mammals and herpetofauna (reptiles and amphibians), as a separate avifauna assessment was conducted and can be found in the accompanying avifauna assessment report (TBC, 2024). The faunal field survey utilised a variety of sampling techniques, including but not limited to:

- Visual and auditory searches: This involves strategic meandering and the use of binoculars and specialist camera equipment to view species from a distance without them being disturbed;
- Active hand-searches: Used for species that shelter in or under particular micro-habitats (typically rocks, exfoliating rock outcrops, fallen trees, leaf litter, bark etc.); and
- The identification of tracks and signs, and listening to species calls.

Relevant field guides and texts consulted for identification purposes included the following:

- The Mammals of the Southern African Subregion (Skinner & Chimimba, 2005);
- Field Guide to Snakes and other Reptiles of Southern Africa (Branch, 1998);
- A Complete Guide to the Snakes of Southern Africa (Marais, 2004);
- Atlas and Red List of the Reptiles of South Africa, Lesotho and Swaziland (Bates et al, 2014);
- A Complete Guide to the Frogs of Southern Africa (du Preez and Carruthers, 2009);
- Stuarts' Field Guide to Mammals of Southern Africa including Angola, Zambia & Malawi (Stuart and Stuart, 2015); and
- A Field Guide to the Tracks and Signs of Southern and East African Wildlife (Stuart and Stuart, 2000).

7.2 Appendix B: Terrestrial Site Ecological Importance

The different habitat types within the PAOI were delineated and identified based on observations made during the field survey, and information from available satellite imagery. These habitat types were assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of SCC and their ecosystem processes.

Site Ecological Importance (SEI) is a function of the Biodiversity Importance (BI) of the receptor (e.g., SCC, the vegetation/fauna community or habitat type present in the PAOI) and Receptor Resilience (RR) (its resilience to impacts).

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor. The criteria for the CI and FI ratings are provided in Table 7-1 and Table 7-2 respectively.

Table 7-1 Summary of Conservation Importance (CI) criteria

Conservation Importance	Fulfilling Criteria
Very High	Confirmed or highly likely occurrence of Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Extremely Rare or CR species that have a global extent of occurrence (EOO) of < 10 km ² . Any area of natural habitat of a CR ecosystem type or large area (> 0.1% of the total ecosystem type extent) of natural habitat of an EN ecosystem type. Globally significant populations of congregatory species (> 10% of global population).
High	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km ² . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A. If listed as threatened only under Criterion A, include if there are less than 10 locations or < 10 000 mature individuals remaining. Small area (> 0.01% but < 0.1% of the total ecosystem type extent) of natural habitat of EN ecosystem type or large area (> 0.1%) of natural habitat of VU ecosystem type. Presence of Rare species. Globally significant populations of congregatory species (> 1% but < 10% of global population).
Medium	Confirmed or highly likely occurrence of populations of Near Threatened (NT) species, threatened species (CR, EN, VU) listed under Criterion A only and which have more than 10 locations or more than 10 000 mature individuals. Any area of natural habitat of threatened ecosystem type with status of VU. Presence of range-restricted species. > 50% of receptor contains natural habitat with potential to support SCC.
Low	No confirmed or highly likely populations of SCC. No confirmed or highly likely populations of range-restricted species. < 50% of receptor contains natural habitat with limited potential to support SCC.
Very Low	No confirmed and highly unlikely populations of SCC. No confirmed and highly unlikely populations of range-restricted species. No natural habitat remaining.

Table 7-2 Summary of Functional Integrity (FI) criteria

Functional Integrity	Fulfilling Criteria
Very High	Very large (> 100 ha) intact area for any conservation status of ecosystem type or > 5 ha for CR ecosystem types. High habitat connectivity serving as functional ecological corridors, limited road network between intact habitat patches. No or minimal current negative ecological impacts, with no signs of major past disturbance.
High	Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types. Good habitat connectivity, with potentially functional ecological corridors and a regularly used road network between intact habitat patches. Only minor current negative ecological impacts, with no signs of major past disturbance and good rehabilitation potential.
Medium	Medium (> 5 ha but < 20 ha) semi-intact area for any conservation status of ecosystem type or > 20 ha for VU ecosystem types. Only narrow corridors of good habitat connectivity or larger areas of poor habitat connectivity and a busy used road network between intact habitat patches. Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
Low	Small (> 1 ha but < 5 ha) area. Almost no habitat connectivity but migrations still possible across some modified or degraded natural habitat and a very busy used road network surrounds the area. Low rehabilitation potential. Several minor and major current negative ecological impacts.
Very Low	Very small (< 1 ha) area. No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.

BI can be derived from a simple matrix of CI and FI as provided in Table 7-3.

Table 7-3 Matrix used to derive Biodiversity Importance (BI) from Functional Integrity (FI) and Conservation Importance (CI)

Biodiversity Importance		Conservation Importance				
		Very High	High	Medium	Low	Very Low
Functional Integrity	Very High	Very High	Very High	High	Medium	Low
	High	Very High	High	Medium	Medium	Low
	Medium	High	Medium	Medium	Low	Very Low
	Low	Medium	Medium	Low	Low	Very Low
	Very Low	Medium	Low	Very Low	Very Low	Very Low

The fulfilling criteria to evaluate RR are based on the estimated recovery time required to restore an appreciable portion of functionality to the receptor, as summarised in Table 7-4.

Table 7-4 Summary of Receptor Resilience (RR) criteria

Resilience	Fulfilling Criteria
Very High	Habitat that can recover rapidly (~ less than 5 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a very high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
High	Habitat that can recover relatively quickly (~ 5–10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a high likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Medium	Will recover slowly (~ more than 10 years) to restore > 75% of the original species composition and functionality of the receptor functionality, or species that have a moderate likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Low	Habitat that is unlikely to be able to recover fully after a relatively long period: > 15 years required to restore ~ less than 50% of the original species composition and functionality of the receptor functionality, or species that have a low likelihood of: (i) remaining at a site even when a disturbance or impact is occurring, or (ii) returning to a site once the disturbance or impact has been removed.
Very Low	Habitat that is unable to recover from major impacts, or species that are unlikely to: (i) remain at a site even when a disturbance or impact is occurring, or (ii) return to a site once the disturbance or impact has been removed.

After the determination of BI and RR, the SEI can be ascertained using the matrix as provided in Table 7-5.

Table 7-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance				
		Very High	High	Medium	Low	Very Low
Receptor Resilience	Very Low	Very High	Very High	High	Medium	Low
	Low	Very High	Very High	High	Medium	Very Low
	Medium	Very High	High	Medium	Low	Very Low
	High	High	Medium	Low	Very Low	Very Low
	Very High	Medium	Low	Very Low	Very Low	Very Low

Interpretation of the SEI in the context of the proposed project is provided in Table 7-6.

Table 7-6 ***Guideline for interpreting Site Ecological Importance in the context of proposed activities***

Site Ecological Importance	Interpretation in relation to proposed development activities
Very High	Avoidance mitigation – no destructive development activities should be considered. Offset mitigation not acceptable/not possible (i.e., last remaining populations of species, last remaining good condition patches of ecosystems/unique species assemblages). Destructive impacts for species/ecosystems where persistence target remains.
High	Avoidance mitigation wherever possible. Minimisation mitigation – changes to project infrastructure design to limit the amount of habitat impacted, limited development activities of low impact acceptable. Offset mitigation may be required for high impact activities.
Medium	Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.
Low	Minimisation and restoration mitigation – development activities of medium to high impact acceptable followed by appropriate restoration activities.
Very Low	Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.

The SEI evaluated for each taxon can be combined into a single multi-taxon evaluation of SEI for the assessment area. Either a combination of the maximum SEI for each receptor should be applied, or the SEI may be evaluated only once per receptor but for all necessary taxa simultaneously. For the latter, justification of the SEI for each receptor is based on the criteria that conforms to the highest CI and FI, and the lowest RR across all taxa.

7.3 Appendix C: Expected Species Lists

7.3.1 Expected Flora Species

Family	Scientific Name	SANBI, IUCN	RSA Status
Acanthaceae	<i>Justicia orchioides</i>	,	Indigenous; Endemic
Aizoaceae	<i>Ruschia rigens</i>	LC , LC	Indigenous; Endemic
Aizoaceae	<i>Ruschia ruralis</i>	LC , LC	Indigenous; Endemic
Aizoaceae	<i>Trianthema salsoloides</i>	,	Indigenous
Aizoaceae	<i>Mestoklema arboriforme</i>	LC , LC	Indigenous; Endemic
Aizoaceae	<i>Delosperma mahonii</i>	LC , LC	Indigenous
Aizoaceae	<i>Trianthema parvifolia</i>	,	Indigenous
Aizoaceae	<i>Chasmatophyllum musculinum</i>	LC , LC	Indigenous
Amaranthaceae	<i>Sericorema sericea</i>	LC , LC	Indigenous
Amaranthaceae	<i>Sericorema remotiflora</i>	LC , LC	Indigenous
Amaranthaceae	<i>Salsola humifusa</i>	LC , LC	Indigenous; Endemic
Amaryllidaceae	<i>Nerine laticoma</i>	LC , LC	Indigenous
Amaryllidaceae	<i>Boophone disticha</i>	LC , LC	Indigenous
Amaryllidaceae	<i>Brunsvigia radulosa</i>	LC , LC	Indigenous
Anacampserotaceae	<i>Anacampseros buderiana</i>	,	Indigenous
Anacampserotaceae	<i>Avonia ustulata</i>	,	Indigenous; Endemic
Anacampserotaceae	<i>Anacampseros ustulata</i>	LC , LC	Indigenous; Endemic
Anacardiaceae	<i>Smodium argutum</i>	LC , LC	Indigenous; Endemic
Apocynaceae	<i>Stenostelma capense</i>	LC , LC	Indigenous
Apocynaceae	<i>Stapelia grandiflora</i>	,	Indigenous
Aponogetonaceae	<i>Aponogeton junceus</i>	LC , LC	Indigenous
Araceae	<i>Lemna gibba</i>	LC , LC	Indigenous
Asphodelaceae	<i>Bulbine narcissifolia</i>	LC , LC	Indigenous
Asphodelaceae	<i>Aloe grandidentata</i>	LC , LC	Indigenous
Asphodelaceae	<i>Trachyandra asperata</i>	,	Indigenous
Asphodelaceae	<i>Bulbine abyssinica</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio laevigatus</i>	,	Indigenous
Asteraceae	<i>Tarchonanthus camphoratus</i>		
Asteraceae	<i>Nolletia ciliaris</i>	LC , LC	Indigenous
Asteraceae	<i>Arctotis arctotoides</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio hastatus</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio harveianus</i>	LC , LC	Indigenous
Asteraceae	<i>Eriocephalus karoocicus</i>	LC , LC	Indigenous; Endemic
Asteraceae	<i>Senecio affinis</i>	LC , LC	Indigenous
Asteraceae	<i>Tripteris aghillana</i>	,	Indigenous
Asteraceae	<i>Felicia burkei</i>	LC , LC	Indigenous

D3 Energy Production Right

Asteraceae	<i>Helichrysum paronychioides</i>	LC , LC	Indigenous
Asteraceae	<i>Hilliardiella pinifolia</i>	LC , LC	Indigenous
Asteraceae	<i>Rosenia humilis</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio inornatus</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio coronatus</i>	LC , LC	Indigenous
Asteraceae	<i>Felicia fascicularis</i>	LC , LC	Indigenous
Asteraceae	<i>Dimorphotheca zeyheri</i>	LC , LC	Indigenous
Asteraceae	<i>Dicoma anomala</i>	,	Indigenous
Asteraceae	<i>Gazania krebsiana</i>	,	Indigenous
Asteraceae	<i>Helichrysum caespititium</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio asperulus</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio consanguineus</i>	LC , LC	Indigenous
Asteraceae	<i>Helichrysum pumilio</i>	,	Indigenous
Asteraceae	<i>Geigeria aspera</i>	,	Indigenous
Asteraceae	<i>Arctotis stoechadifolia</i>	LC , LC	Indigenous; Endemic
Asteraceae	<i>Senecio achilleifolius</i>	LC , LC	Indigenous
Asteraceae	<i>Senecio radicans</i>	,	Indigenous
Boraginaceae	<i>Heliotropium lineare</i>	LC , LC	Indigenous
Bryaceae	<i>Bryum dichotomum</i>	,	Indigenous
Bryaceae	<i>Bryum argenteum</i>	,	Indigenous
Campanulaceae	<i>Wahlenbergia undulata</i>	LC , LC	Indigenous
Campanulaceae	<i>Wahlenbergia androsacea</i>	LC , LC	Indigenous
Convolvulaceae	<i>Merremia verecunda</i>	LC , LC	Indigenous
Convolvulaceae	<i>Ipomoea simplex</i>	LC , LC	Indigenous
Convolvulaceae	<i>Convolvulus sagittatus</i>	LC , LC	Indigenous
Convolvulaceae	<i>Seddera capensis</i>	LC , LC	Indigenous
Crassulaceae	<i>Crassula tabularis</i>	LC , LC	Indigenous
Crassulaceae	<i>Kalanchoe thyrsiflora</i>	LC , LC	Indigenous
Crassulaceae	<i>Crassula corallina</i>		
Cucurbitaceae	<i>Acanthosicyos naudinianus</i>	LC , LC	Indigenous
Cyperaceae	<i>Bulbostylis hispidula</i>	,	Indigenous
Cyperaceae	<i>Cyperus longus</i>	LC , LC	Indigenous
Cyperaceae	<i>Cyperus esculentus</i>	,	Indigenous
Cyperaceae	<i>Cyperus marginatus</i>	LC , LC	Indigenous
Cyperaceae	<i>Cyperus usitatus</i>	LC , LC	Indigenous
Cyperaceae	<i>Schoenoplectus muricinux</i>	LC , LC	Indigenous
Cyperaceae	<i>Schoenoplectus corymbosus</i>	LC , LC	Indigenous
Cyperaceae	<i>Cyperus semitrifidus</i>	LC , LC	Indigenous
Cyperaceae	<i>Kyllinga alata</i>	LC , LC	Indigenous

D3 Energy Production Right

Cyperaceae	<i>Kyllinga alba</i>	LC , LC	Indigenous
Cyperaceae	<i>Cyperus difformis</i>	LC , LC	Indigenous
Cyperaceae	<i>Afroscirpoides dioeca</i>	,	Indigenous
Cyperaceae	<i>Cyperus laevigatus</i>	LC , LC	Indigenous
Ebenaceae	<i>Diospyros lycioides</i>	,	Indigenous
Euphorbiaceae	<i>Euphorbia striata</i>	LC , LC	Indigenous
Euphorbiaceae	<i>Euphorbia clavarioides</i>	LC , LC	Indigenous
Euphorbiaceae	<i>Euphorbia spartaria</i>	LC , LC	Indigenous
Euphorbiaceae	<i>Euphorbia inaequilatera</i>	LC , LC	Indigenous
Fabaceae	<i>Listia heterophylla</i>	LC , LC	Indigenous
Fabaceae	<i>Lessertia frutescens</i>	,	Indigenous
Fabaceae	<i>Argyrobium collinum</i>	LC , LC	Indigenous
Fabaceae	<i>Listia marlothii</i>	LC , LC	Indigenous
Fabaceae	<i>Indigofera torulosa</i>	,	Indigenous
Fabaceae	<i>Vachellia karroo</i>	LC , LC	Indigenous
Fabaceae	<i>Lessertia frutescens</i>	,	Indigenous
Fabaceae	<i>Bolusia acuminata</i>	LC , LC	Indigenous
Fabaceae	<i>Crotalaria burkeana</i>	LC , LC	Indigenous
Fabaceae	<i>Crotalaria sphaerocarpa</i>	,	Indigenous
Fabaceae	<i>Indigofera daleoides</i>	LC , LC	Indigenous
Fabaceae	<i>Tephrosia burchellii</i>	LC , LC	Indigenous
Fabaceae	<i>Indigofera alternans</i>	,	Indigenous
Fabaceae	<i>Lessertia prostrata</i>	LC , LC	Indigenous
Fabaceae	<i>Indigofera filipes</i>	LC , LC	Indigenous
Fabaceae	<i>Vachellia hebeclada</i>	,	Indigenous
Fagaceae	<i>Quercus acutissima</i>		
Frankeniaceae	<i>Frankenia pulverulenta</i>	LC , LC	Indigenous
Geraniaceae	<i>Pelargonium dolomiticum</i>	LC , LC	Indigenous
Hyacinthaceae	<i>Drimia elata</i>	LC , LC	Indigenous
Iridaceae	<i>Gladiolus permeabilis</i>	,	Indigenous
Iridaceae	<i>Gladiolus dalenii</i>	,	Indigenous
Iridaceae	<i>Duthiastrum linifolium</i>	LC , LC	Indigenous; Endemic
Iridaceae	<i>Lapeirousia plicata</i>	,	Indigenous
Iridaceae	<i>Babiana hypogaea</i>	LC , LC	Indigenous
Iridaceae	<i>Moraea pallida</i>		
Juncaceae	<i>Juncus rigidus</i>	LC , LC	Indigenous
Lamiaceae	<i>Salvia stenophylla</i>	,	Indigenous
Lamiaceae	<i>Stachys spathulata</i>	LC , LC	Indigenous
Lobeliaceae	<i>Cyphia triphylla</i>	LC , LC	Indigenous

D3 Energy Production Right

Lobeliaceae	<i>Lobelia thermalis</i>	LC , LC	Indigenous
Menispermaceae	<i>Antizoma angustifolia</i>	LC , LC	Indigenous
Myrsinaceae	<i>Myrsine africana</i>	LC , LC	Indigenous
Orchidaceae	<i>Habenaria epipactidea</i>	LC , LC	Indigenous
Orobanchaceae	<i>Harveya pumila</i>	LC , LC	Indigenous
Papaveraceae	<i>Papaver aculeatum</i>	LC , LC	Indigenous
Poaceae	<i>Aristida congesta</i>	,	Indigenous
Poaceae	<i>Setaria sphacelata</i>	,	Indigenous
Poaceae	<i>Cynodon transvaalensis</i>		
Poaceae	<i>Eragrostis trichophora</i>	LC , LC	Indigenous
Poaceae	<i>Digitaria eriantha</i>	LC , LC	Indigenous
Poaceae	<i>Eleusine coracana</i>	,	Indigenous
Poaceae	<i>Eragrostis bicolor</i>	LC , LC	Indigenous
Poaceae	<i>Themeda triandra</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis nindensis</i>	LC , LC	Indigenous
Poaceae	<i>Aristida diffusa</i>	,	Indigenous
Poaceae	<i>Cymbopogon plurinodis</i>	,	Indigenous
Poaceae	<i>Aristida junciformis</i>	,	Indigenous
Poaceae	<i>Eragrostis racemosa</i>	LC , LC	Indigenous
Poaceae	<i>Heteropogon contortus</i>	LC , LC	Indigenous
Poaceae	<i>Brachiaria serrata</i>	LC , LC	Indigenous
Poaceae	<i>Echinochloa holubii</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis gummiflua</i>	LC , LC	Indigenous
Poaceae	<i>Aristida meridionalis</i>	LC , LC	Indigenous
Poaceae	<i>Oropetium capense</i>	LC , LC	Indigenous
Poaceae	<i>Chloris virgata</i>	LC , LC	Indigenous
Poaceae	<i>Cynodon dactylon</i>	LC , LC	Indigenous
Poaceae	<i>Hyparrhenia hirta</i>	LC , LC	Indigenous
Poaceae	<i>Elionurus muticus</i>	LC , LC	Indigenous
Poaceae	<i>Eustachys paspaloides</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis × pseudobutusa</i>	NE , NE	Indigenous; Endemic
Poaceae	<i>Aristida stipitata</i>	,	Indigenous
Poaceae	<i>Aristida adscensionis</i>	LC , LC	Indigenous
Poaceae	<i>Fingerhuthia africana</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis micrantha</i>	LC , LC	Indigenous
Poaceae	<i>Panicum stapfianum</i>	LC , LC	Indigenous
Poaceae	<i>Eleusine indica</i>	LC , LC	Indigenous
Poaceae	<i>Dactyloctenium aegyptium</i>	LC , LC	Indigenous
Poaceae	<i>Setaria pumila</i>	LC , LC	Indigenous

D3 Energy Production Right

Poaceae	<i>Eragrostis lappula</i>	LC , LC	Indigenous
Poaceae	<i>Aristida congesta</i>	,	Indigenous
Poaceae	<i>Eragrostis biflora</i>	LC , LC	Indigenous
Poaceae	<i>Panicum schinzii</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis lehmanniana</i>	,	Indigenous
Poaceae	<i>Echinochloa crus-galli</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis curvula</i>	LC , LC	Indigenous
Poaceae	<i>Cymbopogon pospischilii</i>	NE , NE	Indigenous
Poaceae	<i>Tragus koelerioides</i>	LC , LC	Indigenous
Poaceae	<i>Antheophora pubescens</i>	LC , LC	Indigenous
Poaceae	<i>Triraphis andropogonoides</i>		
Poaceae	<i>Eragrostis superba</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis stapfii</i>	LC , LC	Indigenous
Poaceae	<i>Sporobolus ioclados</i>	LC , LC	Indigenous
Poaceae	<i>Aristida canescens</i>	,	Indigenous
Poaceae	<i>Tragus berteronianus</i>	LC , LC	Indigenous
Poaceae	<i>Panicum coloratum</i>	LC , LC	Indigenous
Poaceae	<i>Sporobolus fimbriatus</i>	LC , LC	Indigenous
Poaceae	<i>Tragus racemosus</i>	LC , LC	Indigenous
Poaceae	<i>Brachiaria nigropedata</i>	LC , LC	Indigenous
Poaceae	<i>Setaria sphacelata</i>	,	Indigenous
Poaceae	<i>Microchloa caffra</i>	LC , LC	Indigenous
Poaceae	<i>Brachiaria eruciformis</i>	LC , LC	Indigenous
Poaceae	<i>Tarigidia aequiglumis</i>	LC , LC	Indigenous
Poaceae	<i>Leptochloa fusca</i>	LC , LC	Indigenous
Poaceae	<i>Digitaria tricholaenoides</i>	LC , LC	Indigenous
Poaceae	<i>Eragrostis obtusa</i>	LC , LC	Indigenous
Poaceae	<i>Urochloa panicoides</i>	LC , LC	Indigenous
Poaceae	<i>Stipagrostis uniplumis</i>	,	Indigenous
Polygalaceae	<i>Polygala hottentotta</i>	LC , LC	Indigenous
Polygonaceae	<i>Rumex lanceolatus</i>	LC , LC	Indigenous
Portulacaceae	<i>Portulaca quadrifida</i>	LC , LC	Indigenous
Portulacaceae	<i>Portulaca hereroensis</i>		
Potamogetonaceae	<i>Potamogeton pectinatus</i>	LC , LC	Indigenous
Pottiaceae	<i>Trichostomum brachydontium</i>	,	Indigenous
Ranunculaceae	<i>Ranunculus trichophyllus</i>	LC , LC	Indigenous
Ricciaceae	<i>Riccia albolimbata</i>	,	Indigenous
Ricciaceae	<i>Riccia albovestita</i>	,	Indigenous
Ricciaceae	<i>Riccia simii</i>	,	Indigenous

D3 Energy Production Right

Ricciaceae	<i>Riccia angolensis</i>	,	Indigenous
Rubiaceae	<i>Oldenlandia herbacea</i>	,	Indigenous
Rubiaceae	<i>Nenax microphylla</i>	LC , LC	Indigenous
Santalaceae	<i>Viscum rotundifolium</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Manulea parviflora</i>	,	Indigenous
Scrophulariaceae	<i>Chaenostoma neglectum</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Chaenostoma patrioticum</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Buddleja saligna</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Jamesbrittenia aurantiaca</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Gomphostigma virgatum</i>	LC , LC	Indigenous
Scrophulariaceae	<i>Nemesia fruticans</i>	LC , LC	Indigenous
Solanaceae	<i>Lycium arenicola</i>	LC , LC	Indigenous
Solanaceae	<i>Lycium hirsutum</i>	LC , LC	Indigenous
Solanaceae	<i>Lycium horridum</i>	LC , LC	Indigenous
Solanaceae	<i>Solanum campylacanthum</i>	,	Indigenous
Solanaceae	<i>Lycium cinereum</i>	LC , LC	Indigenous
Tamaricaceae	<i>Tamarix chinensis</i>		
Verbenaceae	<i>Chascanum pinnatifidum</i>	,	Indigenous
Xyridaceae	<i>Xyris gerrardii</i>	LC , LC	Indigenous
Zygophyllaceae	<i>Tribulus terrestris</i>	LC , LC	Indigenous

7.3.2 Expected Mammal Species

Family	Scientific name	Common name	SANBI, IUCN
Bovidae	<i>Tragelaphus strepsiceros</i>	Southern Greater Kudu	LC, LC
Bovidae	<i>Sylvicapra grimmia</i>	Grey common duiker	LC, LC
Cercopithecidae	<i>Chlorocebus pygerythrus</i>	Southern vervet monkey	LC, LC
Cercopithecidae	<i>Papio ursinus</i>	Chacma baboon	LC, LC
Herpestidae	<i>Atilax paludinosus</i>	Marsh Mongoose	LC, LC
Herpestidae	<i>Cynictis penicillata</i>	Southern Yellow Mongoose	LC, LC
Herpestidae	<i>Herpestes sanguineus</i>	Common slender mongoose	LC, LC
Leporidae	<i>Lepus saxatilis</i>	Scrub hare	LC, LC
Mustelidae	<i>Aonyx capensis</i>	Cape clawless otter	NT, NT
Sciuridae	<i>Xerus inauris</i>	South African Ground Squirrel	LC, LC
Suidae	<i>Phacochoerus africanus</i>	Southern warthog	LC, LC

7.3.3 Expected Reptile Species

Family	Scientific name	Common name	SANBI, IUCN
Agamidae	<i>Agama atra</i>	Southern Rock agama	LC, LC
Colubridae	<i>Dasypeltis scabra</i>	Egg eating snake	LC, LC
Colubridae	<i>Duberria lutrix</i>	Common slug eater	LC, LC
Elapidae	<i>Hemachatus haemachatus</i>	Rinkhals	LC, LC
Gekkonidae	<i>Lygodactylus capensis</i>	Common dwarf gecko	LC, LC
Gekkonidae	<i>Pachydactylus capensis</i>	Cape Thick-toed gecko	LC, LC
Lamprophiidae	<i>Pseudaspis cana</i>	Mole snake	LC, LC
Lamprophiidae	<i>Boaedon capensis</i>	Cape house snake	LC, LC
Lamprophiidae	<i>Psammophylax rhombeatus</i>	Rhombic skaapsteker	LC, LC
Pelomedusidae	<i>Pelomedusa galeata</i>	Cape Terrapin	LC, LC
Scincidae	<i>Trachylepsis punctatissima</i>	Speckled rock skink	LC, LC
Scincidae	<i>Panaspis wahlbergii</i>	Wahlberg's snake-eyed skink	LC, LC
Testudinidae	<i>Stigmochelys pardalis</i>	Leopard Tortoise	LC, LC
Typhlopidae	<i>Afrotyphlops bibronii</i>	Bibron's blind snake	LC, LC

7.3.4 Expected Amphibian Species

Family	Scientific name	Common name	SANBI, IUCN
Bufoidea	<i>Sclerophrys capensis</i>	Raucous toad	LC, LC
Hyperoliidae	<i>Kassina senegalensis</i>	Senegal Running Frog	LC, LC
Pyxicephalidae	<i>Cacosternum boettgeri</i>	Boettger's Dainty frog	LC, LC
Pyxicephalidae	<i>Amietia delalandii</i>	Common River frog	LC, LC
Pyxicephalidae	<i>Pyxicephalus adspersus</i>	Giant African Bullfrog	NT, LC

* Those in red are SCC

7.3.5 Expected Avifauna Species

Family Name	Scientific Name	Common Name	Regional	Global
Accipitridae	<i>Haliaeetus vocifer</i>	African Fish Eagle		
Accipitridae	<i>Polyboroides typus</i>	African Harrier-hawk		
Accipitridae	<i>Circus ranivorus</i>	African Marsh Harrier	VU	LC
Accipitridae	<i>Milvus migrans</i>	Black Kite		
Accipitridae	<i>Accipiter melanoleucus</i>	Black Sparrowhawk		
Accipitridae	<i>Circaetus pectoralis</i>	Black-chested Snake Eagle		
Accipitridae	<i>Elanus caeruleus</i>	Black-winged Kite	NT	LC
Accipitridae	<i>Hieraaetus pennatus</i>	Booted Eagle		
Accipitridae	<i>Buteo buteo</i>	Common Buzzard		
Accipitridae	<i>Pernis apivorus</i>	European Honey Buzzard		
Accipitridae	<i>Micronisus gabar</i>	Gabar Goshawk		
Accipitridae	<i>Buteo rufofuscus</i>	Jackal Buzzard		
Accipitridae	<i>Polemaetus bellicosus</i>	Martial Eagle	EN	EN
Accipitridae	<i>Melierax canorus</i>	Pale Chanting Goshawk		
Accipitridae	<i>Aquila rapax</i>	Tawny Eagle	EN	VU
Accipitridae	<i>Milvus aegyptius</i>	Yellow-billed Kite		
Acrocephalidae	<i>Acrocephalus baeticatus</i>	Common Reed Warbler		
Acrocephalidae	<i>Acrocephalus arundinaceus</i>	Great Reed Warbler		
Acrocephalidae	<i>Hippolais icterina</i>	Icterine Warbler		
Acrocephalidae	<i>Acrocephalus gracilirostris</i>	Lesser Swamp Warbler		
Acrocephalidae	<i>Acrocephalus palustris</i>	Marsh Warbler		
Acrocephalidae	<i>Acrocephalus schoenobaenus</i>	Sedge Warbler		
Alaudidae	<i>Eremopterix leucotis</i>	Chestnut-backed Sparrow-lark		
Alaudidae	<i>Mirafra fasciolata</i>	Eastern Clapper Lark		
Alaudidae	<i>Certhilauda semitorquata</i>	Eastern Long-billed Lark		
Alaudidae	<i>Eremopterix verticalis</i>	Grey-backed Sparrow-lark		
Alaudidae	<i>Mirafra cheniana</i>	Melodious Lark	NT	LC
Alaudidae	<i>Spizocorys conirostris</i>	Pink-billed Lark		
Alaudidae	<i>Calandrella cinerea</i>	Red-capped Lark		
Alaudidae	<i>Mirafra africana</i>	Rufous-naped Lark		
Alaudidae	<i>Calendulauda sabota</i>	Sabota Lark		
Alaudidae	<i>Chersomanes albobasata</i>	Spike-heeled Lark		
Alcedinidae	<i>Halcyon albiventris</i>	Brown-hooded Kingfisher		
Alcedinidae	<i>Megaceryle maxima</i>	Giant Kingfisher		
Alcedinidae	<i>Corythornis cristatus</i>	Malachite Kingfisher		
Alcedinidae	<i>Ceryle rudis</i>	Pied Kingfisher		
Anatidae	<i>Anas sparsa</i>	African Black Duck		
Anatidae	<i>Spatula hottentota</i>	Blue-billed Teal		
Anatidae	<i>Spatula smithii</i>	Cape Shoveler	NT	LC
Anatidae	<i>Anas capensis</i>	Cape Teal		
Anatidae	<i>Alopochen aegyptiaca</i>	Egyptian Goose		
Anatidae	<i>Dendrocygna bicolor</i>	Fulvous Whistling Duck	NT	LC

D3 Energy Production Right

Anatidae	<i>Sarkidiornis melanotos</i>	Knob-billed Duck	NT	LC
Anatidae	<i>Oxyura maccoa</i>	Maccoa Duck	VU	EN
Anatidae	<i>Anas erythrorhyncha</i>	Red-billed Teal	NT	LC
Anatidae	<i>Tadorna cana</i>	South African Shelduck		
Anatidae	<i>Netta erythrophthalma</i>	Southern Pochard	NT	LC
Anatidae	<i>Plectropterus gambensis</i>	Spur-winged Goose		
Anatidae	<i>Thalassornis leuconotus</i>	White-backed Duck	NT	LC
Anatidae	<i>Dendrocygna viduata</i>	White-faced Whistling Duck		
Anatidae	<i>Anas undulata</i>	Yellow-billed Duck	NT	LC
Anhingidae	<i>Anhinga rufa</i>	African Darter	NT	LC
Apodidae	<i>Apus barbatus</i>	African Black Swift		
Apodidae	<i>Cypsiurus parvus</i>	African Palm Swift		
Apodidae	<i>Tachymarpis melba</i>	Alpine Swift		
Apodidae	<i>Apus apus</i>	Common Swift		
Apodidae	<i>Apus horus</i>	Horus Swift		
Apodidae	<i>Apus affinis</i>	Little Swift		
Apodidae	<i>Apus caffer</i>	White-rumped Swift		
Ardeidae	<i>Egretta ardesiaca</i>	Black Heron		
Ardeidae	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron	NT	LC
Ardeidae	<i>Ardea melanocephala</i>	Black-headed Heron		
Ardeidae	<i>Ardea goliath</i>	Goliath Heron		
Ardeidae	<i>Ardea alba</i>	Great Egret	NT	LC
Ardeidae	<i>Ardea cinerea</i>	Grey Heron		
Ardeidae	<i>Ixobrychus minutus</i>	Little Bittern		
Ardeidae	<i>Egretta garzetta</i>	Little Egret		
Ardeidae	<i>Ardea purpurea</i>	Purple Heron		
Ardeidae	<i>Ardeola ralloides</i>	Squacco Heron		
Ardeidae	<i>Butorides striata</i>	Striated Heron		
Ardeidae	<i>Bubulcus ibis</i>	Western Cattle Egret		
Ardeidae	<i>Ardea brachyrhyncha</i>	Yellow-billed Egret	NT	LC
Burhinidae	<i>Burhinus capensis</i>	Spotted Thick-knee		
Caprimulgidae	<i>Caprimulgus rufigena</i>	Rufous-cheeked Nightjar		
Charadriidae	<i>Vanellus armatus</i>	Blacksmith Lapwing		
Charadriidae	<i>Charadrius pallidus</i>	Chestnut-banded Plover	VU	LC
Charadriidae	<i>Charadrius hiaticula</i>	Common Ringed Plover		
Charadriidae	<i>Vanellus coronatus</i>	Crowned Lapwing		
Charadriidae	<i>Pluvialis squatarola</i>	Grey Plover	NT	VU
Charadriidae	<i>Charadrius pecuarius</i>	Kittlitz's Plover	NT	LC
Charadriidae	<i>Charadrius tricollaris</i>	Three-banded Plover		
Ciconiidae	<i>Ciconia abdimii</i>	Abdim's Stork		
Ciconiidae	<i>Anastomus lamelligerus</i>	African Openbill		
Ciconiidae	<i>Ciconia nigra</i>	Black Stork	EN	LC
Ciconiidae	<i>Mycteria ibis</i>	Yellow-billed Stork	VU	LC
Cisticolidae	<i>Apalis thoracica</i>	Bar-throated Apalis		

D3 Energy Production Right

Cisticolidae	<i>Prinia flavicans</i>	Black-chested Prinia		
Cisticolidae	<i>Cisticola textrix</i>	Cloud Cisticola		
Cisticolidae	<i>Cisticola aridulus</i>	Desert Cisticola		
Cisticolidae	<i>Cisticola tinniens</i>	Levaillant's Cisticola		
Cisticolidae	<i>Cisticola fulvicapilla</i>	Neddicky		
Cisticolidae	<i>Cisticola chiniana</i>	Rattling Cisticola		
Cisticolidae	<i>Malcorus pectoralis</i>	Rufous-eared Warbler		
Cisticolidae	<i>Cisticola ayresii</i>	Wing-snapping Cisticola		
Cisticolidae	<i>Eremomela icteropygialis</i>	Yellow-bellied Eremomela		
Cisticolidae	<i>Cisticola juncidis</i>	Zitting Cisticola		
Coliidae	<i>Urocolius indicus</i>	Red-faced Mousebird		
Coliidae	<i>Colius striatus</i>	Speckled Mousebird		
Coliidae	<i>Colius colius</i>	White-backed Mousebird		
Columbidae	<i>Spilopelia senegalensis</i>	Laughing Dove		
Columbidae	<i>Oena capensis</i>	Namaqua Dove		
Columbidae	<i>Streptopelia semitorquata</i>	Red-eyed Dove		
Columbidae	<i>Streptopelia capicola</i>	Ring-necked Dove		
Columbidae	<i>Columba livia</i>	Rock Dove		
Columbidae	<i>Columba guinea</i>	Speckled Pigeon		
Coraciidae	<i>Coracias garrulus</i>	European Roller	NT	LC
Coraciidae	<i>Coracias caudatus</i>	Lilac-breasted Roller		
Corvidae	<i>Corvus albus</i>	Pied Crow		
Cuculidae	<i>Centropus burchellii</i>	Burchell's Coucal		
Cuculidae	<i>Cuculus canorus</i>	Common Cuckoo		
Cuculidae	<i>Chrysococcyx caprius</i>	Diederik Cuckoo		
Cuculidae	<i>Clamator glandarius</i>	Great Spotted Cuckoo		
Cuculidae	<i>Clamator jacobinus</i>	Jacobin Cuckoo		
Cuculidae	<i>Chrysococcyx klaas</i>	Klaas's Cuckoo		
Cuculidae	<i>Cuculus solitarius</i>	Red-chested Cuckoo		
Emberizidae	<i>Emberiza capensis</i>	Cape Bunting		
Emberizidae	<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting		
Emberizidae	<i>Emberiza flaviventris</i>	Golden-breasted Bunting		
Emberizidae	<i>Emberiza impetuari</i>	Lark-like Bunting		
Estrildidae	<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch		
Estrildidae	<i>Lagonosticta senegala</i>	Red-billed Firefinch		
Estrildidae	<i>Amadina erythrocephala</i>	Red-headed Finch		
Estrildidae	<i>Brunhilda erythronotos</i>	Black-faced Waxbill		
Estrildidae	<i>Uraeginthus angolensis</i>	Blue Waxbill		
Estrildidae	<i>Spermestes cucullata</i>	Bronze Mannikin		
Estrildidae	<i>Estrilda astrild</i>	Common Waxbill		
Estrildidae	<i>Pytilia melba</i>	Green-winged Pytilia		
Estrildidae	<i>Amandava subflava</i>	Orange-breasted Waxbill		
Estrildidae	<i>Ortygospiza atricollis</i>	Quailfinch		
Estrildidae	<i>Granatina granatina</i>	Violet-eared Waxbill		

D3 Energy Production Right

Falconidae	<i>Falco amurensis</i>	Amur Falcon		
Falconidae	<i>Falco rupicoloides</i>	Greater Kestrel		
Falconidae	<i>Falco biarmicus</i>	Lanner Falcon	NT	LC
Falconidae	<i>Falco naumanni</i>	Lesser Kestrel	VU	LC
Falconidae	<i>Falco peregrinus</i>	Peregrine Falcon		
Falconidae	<i>Falco vespertinus</i>	Red-footed Falcon	VU	VU
Falconidae	<i>Falco rupicolus</i>	Rock Kestrel		
Fringillidae	<i>Crithagra atrogularis</i>	Black-throated Canary		
Fringillidae	<i>Serinus canicollis</i>	Cape Canary		
Fringillidae	<i>Crithagra albogularis</i>	White-throated Canary		
Fringillidae	<i>Crithagra flaviventris</i>	Yellow Canary		
Glareolidae	<i>Glareola nordmanni</i>	Black-winged Pratincole	LC	NT
Glareolidae	<i>Rhinoptilus africanus</i>	Double-banded Courser		
Glareolidae	<i>Cursorius temminckii</i>	Temminck's Courser		
Hirundinidae	<i>Neophedina cincta</i>	Banded Martin		
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow		
Hirundinidae	<i>Riparia paludicola</i>	Brown-throated Martin		
Hirundinidae	<i>Delichon urbicum</i>	Common House Martin		
Hirundinidae	<i>Cecropis cucullata</i>	Greater Striped Swallow		
Hirundinidae	<i>Ptyonoprogne fuligula</i>	Large Rock Martin		
Hirundinidae	<i>Hirundo dimidiata</i>	Pearl-breasted Swallow		
Hirundinidae	<i>Cecropis semirufa</i>	Red-breasted Swallow		
Hirundinidae	<i>Petrochelidon spilodera</i>	South African Cliff Swallow		
Hirundinidae	<i>Hirundo albigularis</i>	White-throated Swallow		
Indicatoridae	<i>Indicator indicator</i>	Greater Honeyguide		
Indicatoridae	<i>Indicator minor</i>	Lesser Honeyguide		
Jacanidae	<i>Actophilornis africanus</i>	African Jacana		
Laniidae	<i>Lanius minor</i>	Lesser Grey Shrike		
Laniidae	<i>Lanius collurio</i>	Red-backed Shrike		
Laniidae	<i>Lanius collaris</i>	Southern Fiscal		
Laridae	<i>Hydropogon caspia</i>	Caspian Tern	VU	LC
Laridae	<i>Chroicocephalus cirrocephalus</i>	Grey-headed Gull		
Laridae	<i>Larus dominicanus</i>	Kelp Gull		
Laridae	<i>Chlidonias hybrida</i>	Whiskered Tern		
Laridae	<i>Chlidonias leucopterus</i>	White-winged Tern		
Locustellidae	<i>Bradypterus baboecala</i>	Little Rush Warbler		
Lybiidae	<i>Tricholaema leucomelas</i>	Acacia Pied Barbet		
Lybiidae	<i>Lybius torquatus</i>	Black-collared Barbet		
Lybiidae	<i>Trachyphonus vaillantii</i>	Crested Barbet		
Macrosphenidae	<i>Sylvietta rufescens</i>	Long-billed Crombec		
Malaconotidae	<i>Telophorus zeylonus</i>	Bokmakierie		
Malaconotidae	<i>Tchagra australis</i>	Brown-crowned Tchagra		
Malaconotidae	<i>Nilais afer</i>	Brubru		
Malaconotidae	<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike		

D3 Energy Production Right

Meropidae	<i>Merops apiaster</i>	European Bee-eater		
Meropidae	<i>Merops pusillus</i>	Little Bee-eater		
Meropidae	<i>Merops hirundineus</i>	Swallow-tailed Bee-eater		
Meropidae	<i>Merops bullockoides</i>	White-fronted Bee-eater		
Monarchidae	<i>Terpsiphone viridis</i>	African Paradise Flycatcher		
Motacillidae	<i>Motacilla aguimp</i>	African Pied Wagtail		
Motacillidae	<i>Anthus cinnamomeus</i>	African Pipit		
Motacillidae	<i>Anthus vaalensis</i>	Buffy Pipit		
Motacillidae	<i>Macronyx capensis</i>	Cape Longclaw		
Motacillidae	<i>Motacilla capensis</i>	Cape Wagtail		
Motacillidae	<i>Anthus nicholsoni</i>	Nicholson's Pipit		
Motacillidae	<i>Anthus leucophrys</i>	Plain-backed Pipit		
Muscicapidae	<i>Saxicola torquatus</i>	African Stonechat		
Muscicapidae	<i>Myrmecocichla formicivora</i>	Ant-eating Chat		
Muscicapidae	<i>Cossypha caffra</i>	Cape Robin-chat		
Muscicapidae	<i>Oenanthe pileata</i>	Capped Wheatear		
Muscicapidae	<i>Stenostira scita</i>	Fairy Flycatcher		
Muscicapidae	<i>Oenanthe familiaris</i>	Familiar Chat		
Muscicapidae	<i>Melaenornis silens</i>	Fiscal Flycatcher		
Muscicapidae	<i>Cercotrichas paena</i>	Kalahari Scrub Robin		
Muscicapidae	<i>Cercotrichas coryphoeus</i>	Karoo Scrub Robin		
Muscicapidae	<i>Thamnodon cinnamomeiventris</i>	Mocking Cliff Chat		
Muscicapidae	<i>Myrmecocichla monticola</i>	Mountain Wheatear		
Muscicapidae	<i>Emarginata sinuata</i>	Sickle-winged Chat		
Muscicapidae	<i>Muscicapa striata</i>	Spotted Flycatcher		
Nectariniidae	<i>Chalcomitra amethystina</i>	Amethyst Sunbird		
Nectariniidae	<i>Cinnyris talatala</i>	White-bellied Sunbird		
Numididae	<i>Numida meleagris</i>	Helmeted Guinea fowl		
Otididae	<i>Eupodotis caerulea</i>	Blue Korhaan	VU	NT
Otididae	<i>Afrotis afraoides</i>	Northern Black Korhaan		
Paridae	<i>Melaniparus cinerascens</i>	Ashy Tit		
Passeridae	<i>Passer melanurus</i>	Cape Sparrow		
Passeridae	<i>Passer domesticus</i>	House Sparrow		
Passeridae	<i>Passer diffusus</i>	Southern Grey-headed Sparrow		
Phalacrocoracidae	<i>Microcarbo africanus</i>	Reed Cormorant		
Phalacrocoracidae	<i>Phalacrocorax lucidus</i>	White-breasted Cormorant		
Phasianidae	<i>Coturnix coturnix</i>	Common Quail		
Phasianidae	<i>Pavo cristatus</i>	Indian Peafowl		
Phasianidae	<i>Pternistis natalensis</i>	Natal Spurfowl		
Phasianidae	<i>Scleroptila gutturalis</i>	Orange River Francolin		
Phasianidae	<i>Pternistis swainsonii</i>	Swainson's Spurfowl		
Phoenicopteridae	<i>Phoenicopterus roseus</i>	Greater Flamingo	NT	LC
Phoenicopteridae	<i>Phoeniconaias minor</i>	Lesser Flamingo	VU	NT
Phoeniculidae	<i>Rhinopomastus cyanomelas</i>	Common Scimitarbill		

D3 Energy Production Right

Phoeniculidae	<i>Phoeniculus purpureus</i>	Green Wood Hoopoe		
Phylloscopidae	<i>Phylloscopus trochilus</i>	Willow Warbler		
Picidae	<i>Dendropicos fuscescens</i>	Cardinal Woodpecker		
Picidae	<i>Campethera abingoni</i>	Golden-tailed Woodpecker		
Picidae	<i>Jynx ruficollis</i>	Red-throated Wryneck		
Platysteiridae	<i>Batis pririt</i>	Pirit Batis		
Ploceidae	<i>Ploceus capensis</i>	Cape Weaver		
Ploceidae	<i>Euplectes progne</i>	Long-tailed Widowbird		
Ploceidae	<i>Quelea quelea</i>	Red-billed Quelea		
Ploceidae	<i>Euplectes ardens</i>	Red-collared Widowbird		
Ploceidae	<i>Sporopipes squamifrons</i>	Scaly-feathered Weaver		
Ploceidae	<i>Ploceus velatus</i>	Southern Masked Weaver		
Ploceidae	<i>Euplectes orix</i>	Southern Red Bishop		
Ploceidae	<i>Ploceus cucullatus</i>	Village Weaver		
Ploceidae	<i>Plocepasser mahali</i>	White-browed Sparrow-weaver		
Ploceidae	<i>Euplectes albonotatus</i>	White-winged Widowbird		
Ploceidae	<i>Euplectes afer</i>	Yellow-crowned Bishop		
Podicipedidae	<i>Podiceps nigricollis</i>	Black-necked Grebe		
Podicipedidae	<i>Podiceps cristatus</i>	Great Crested Grebe	VU	LC
Podicipedidae	<i>Tachybaptus ruficollis</i>	Little Grebe		
Pteroclididae	<i>Pterocles namaqua</i>	Namaqua Sandgrouse		
Pycnonotidae	<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul		
Pycnonotidae	<i>Tringa nebularia</i>	Common Greenshank		
Rallidae	<i>Crecopsis egregia</i>	African Crake		
Rallidae	<i>Rallus caerulescens</i>	African Rail		
Rallidae	<i>Porphyrio madagascariensis</i>	African Swamphe		
Rallidae	<i>Zapornia flavirostra</i>	Black Crake		
Rallidae	<i>Gallinula chloropus</i>	Common Moorhen		
Rallidae	<i>Fulica cristata</i>	Red-knobbed Coot		
Recurvirostridae	<i>Himantopus himantopus</i>	Black-winged Stilt		
Recurvirostridae	<i>Recurvirostra avosetta</i>	Pied Avocet		
Remizidae	<i>Anthoscopus minutus</i>	Cape Penduline Tit		
Rostratulidae	<i>Rostratula benghalensis</i>	Greater Painted-snipe		
Sagittariidae	<i>Sagittarius serpentarius</i>	Secretarybird	VU	EN
Scolopacidae	<i>Gallinago nigripennis</i>	African Snipe		
Scolopacidae	<i>Actitis hypoleucos</i>	Common Sandpiper		
Scolopacidae	<i>Calidris ferruginea</i>	Curlew Sandpiper	VU	VU
Scolopacidae	<i>Calidris minuta</i>	Little Stint		
Scolopacidae	<i>Tringa stagnatilis</i>	Marsh Sandpiper		
Scolopacidae	<i>Calidris pugnax</i>	Ruff		
Scolopacidae	<i>Tringa glareola</i>	Wood Sandpiper		
Scopidae	<i>Scopus umbretta</i>	Hamerkop	NT	LC
Strigidae	<i>Asio capensis</i>	Marsh Owl	NT	LC
Strigidae	<i>Bubo africanus</i>	Spotted Eagle Owl		

D3 Energy Production Right

Strigidae	<i>Tyto alba</i>	Western Barn Owl		
Struthionidae	<i>Struthio camelus</i>	Common Ostrich		
Sturnidae	<i>Lamprotornis nitens</i>	Cape Starling		
Sturnidae	<i>Acridotheres tristis</i>	Common Myna		
Sturnidae	<i>Sturnus vulgaris</i>	Common Starling		
Sturnidae	<i>Lamprotornis bicolor</i>	Pied Starling		
Sturnidae	<i>Onychognathus morio</i>	Red-winged Starling		
Sturnidae	<i>Creatophora cinerea</i>	Wattled Starling		
Sylviidae	<i>Curruca subcoerulea</i>	Chestnut-vented Warbler		
Sylviidae	<i>Sylvia borin</i>	Garden Warbler		
Threskiornithidae	<i>Threskiornis aethiopicus</i>	African Sacred Ibis		
Threskiornithidae	<i>Platalea alba</i>	African Spoonbill		
Threskiornithidae	<i>Plegadis falcinellus</i>	Glossy Ibis		
Threskiornithidae	<i>Bostrychia hagedash</i>	Hadada Ibis		
Threskiornithidae	<i>Geronticus calvus</i>	Southern Bald Ibis	NT	NT
Turdidae	<i>Turdus smithi</i>	Karoo Thrush		
Turnicidae	<i>Turnix sylvaticus</i>	Common Buttonquail		
Upupidae	<i>Upupa africana</i>	African Hoopoe		
Viduidae	<i>Vidua paradisaea</i>	Long-tailed Paradise Whydah		
Viduidae	<i>Vidua macroura</i>	Pin-tailed Whydah		
Viduidae	<i>Vidua regia</i>	Shaft-tailed Whydah		
Viduidae	<i>Vidua chalybeata</i>	Village Indigobird		
Zosteropidae	<i>Zosterops virens</i>	Cape White-eye		
Zosteropidae	<i>Zosterops pallidus</i>	Orange River White-eye		

7.4 Appendix D: Specialist Declaration of Independence

I, Marnus Erasmus, declare that:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.



Marnus Erasmus

Ecologist

The Biodiversity Company

May 2026

7.5 Appendix E: Specialist CVs

Martinus ERASMUS

Pr. Sci. Nat. 118630/17 +27 82 448 1667 martinus@thebiodiversitycompany.com



PROFILE SUMMARY

Environmental and Ecological Specialist with 11 years of consulting experience, including international assignments. Demonstrated expertise across project exploration, mining, engineering, hydropower, renewable energy, and private sector development. Skilled in delivering specialist guidance, technical support, and facilitation to ensure compliance with both local legislative requirements and international lender standards. Registered as a Professional Natural Scientist (Pr Sci Nat) with the South African Council for Natural Scientific Professions.

PERSONAL INFO

Nationality: South African
Date of birth: 03 September 1992

EXPERIENCE

Lender reporting requirements
Environmental, Social and Health Impact Assessments (ESHIA)
Environmental Management Programmes (EMP)
Ecology
Unit Management

SKILLS

- ✓ Biodiversity Assessment
- ✓ Rehabilitation
- ✓ Monitoring & Management Plans
- ✓ GIS spatial analysis and digital cartography
- ✓ Grazing and Fire Management
- ✓ Critical Habitat Assessments

ACADEMIC QUALIFICATIONS

B-Tech in Nature Conservation, Tshwane University of Technology, Pretoria, South Africa

National Diploma in Nature Conservation, Tshwane University of Technology, Pretoria, South Africa.

PROFESSIONAL EXPERIENCE

Aug 2017 – Present	The Biodiversity Company Terrestrial Ecologist / Manager
Jan 2015 – July 2017	Enviro-Insight General and Field assistant

INTERNATIONAL EXPERIENCE

Botswana, Eswatini, Guinea, Lesotho, Liberia, Mauritius, Mozambique, Nigeria, South Africa
Zambia, Zimbabwe

LANGUAGES

English – Proficient
Afrikaans – Proficient



Signed: Martinus Erasmus

