



# **TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED TETRA 4 CLUSTER 2 PROJECT**

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

**05 June 2026**

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<b>Report Name</b>	<b>TERRESTRIAL BIODIVERSITY COMPLIANCE STATEMENT FOR THE PROPOSED TETRA 4 CLUSTER 2 PROJECT</b>	
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<b>Declaration</b>	<p>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, 2017. 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.</p>	

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## Executive Summary

This report assesses the potential impacts of the proposed Tetra 4 Cluster 2 gas project on flora and fauna in the Free State Province, South Africa. The study area covers ca. 27,500 hectares and includes areas for new gas wells, pipelines, and supporting infrastructure.

Specialists from The Biodiversity Company conducted both desktop assessments and field surveys to identify important habitats and any rare or protected species. Most of the area has already been disturbed by farming, mining, and other human activities, so natural habitats are fragmented and degraded. However, some sensitive areas remain, especially certain grasslands and water resources.

### Key findings:

- No fatal flaws were found that would prevent the project from going ahead, provided strict conditions are met;
- Some rare and protected flora and fauna species may be present, but these are limited to small, specific areas;
- Two (2) fauna Sensitive Species were observed within the project area;
- The most sensitive habitats (Medium sensitivity) must be completely avoided by all project activities, these include a small section of the Degraded Grasslands in the north of the project area and Water Resources; and
- The rest of the project area is considered to have Very Low ecological sensitivity, meaning seismic survey activities can proceed if mitigation measures are implemented.

### Recommendations:

- Avoid all Medium sensitivity areas entirely- these are “No - Go” zones;
- Follow all mitigation measures, such as using existing roads, minimising disturbance, and training staff on environmental awareness; and
- Obtain necessary permits before disturbing any protected species.

If these recommendations are followed, the project’s impact on biodiversity is expected to be Low and manageable.

## 1 Introduction

### 1.1 Background

The Biodiversity Company (TBC) was appointed to undertake a terrestrial biodiversity, plant and animal species assessment for the proposed Tetra 4 Cluster 2 project. The project area extends from Virginia in the Matjhabeng Local Municipality towards Theunissen, in the Masilonyana Local Municipality, both of which are located within the Lejweleputsa District Municipality, Free State Province, South Africa.

The Project Area of Influence (PAOI) covers *ca.* 27482.56 hectares (ha), encompasses the full extent of all proposed project components associated with the development of natural gas (Helium and Methane) production operations. The PAOI comprises the direct footprint of all proposed project components, including Priority Wells Transects (with a 600 m buffer), powerlines, lay-down areas, and pipelines (with a 300 m buffer). The PAOI thus represents the area where project-related impacts are most likely to occur and where detailed field surveys, impact assessments, and mitigation planning are concentrated. A map illustrating the regional locality of the assessment area is depicted in Figure 1-1, and a site locality illustrated in Figure 1-2.

A field survey for the general area was undertaken on the 2<sup>nd</sup> of February 2026 (wet season survey) in order to determine the presence of any additional fauna, flora and SCCs that may have been missed during the first survey (14<sup>th</sup> till the 18<sup>th</sup> of March 2022), to determine the presence of flora, fauna and the vegetation of the PAOI, as well as likelihood of Species of Conservation Concern (SCC) occurring within the PAOI. Both the desktop assessment and field surveys involved the detection, identification, and description of any locally relevant sensitive receptors. The potential risks that the proposed development would have on the sensitive features was also investigated.

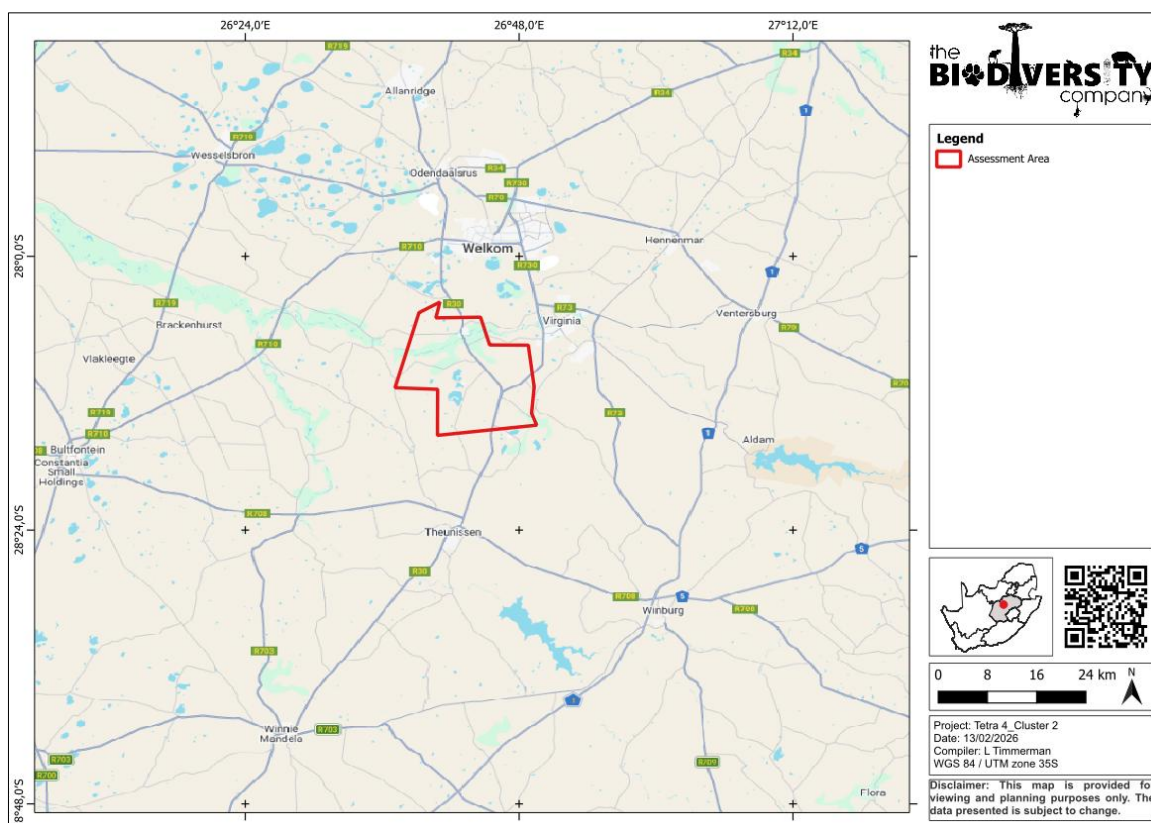
This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations, 2014 (No. 326, 7 April 2017) of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). The approach has taken cognisance of the recently published Government Notice 320 in terms of NEMA dated 20 March 2020 as well as the Government Notice 1150 in terms of NEMA dated 30 October 2020: "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, when applying for Environmental Authorisation".

The National Web-based Environmental Screening Tool has characterised the theme sensitivities of the PAOI as:

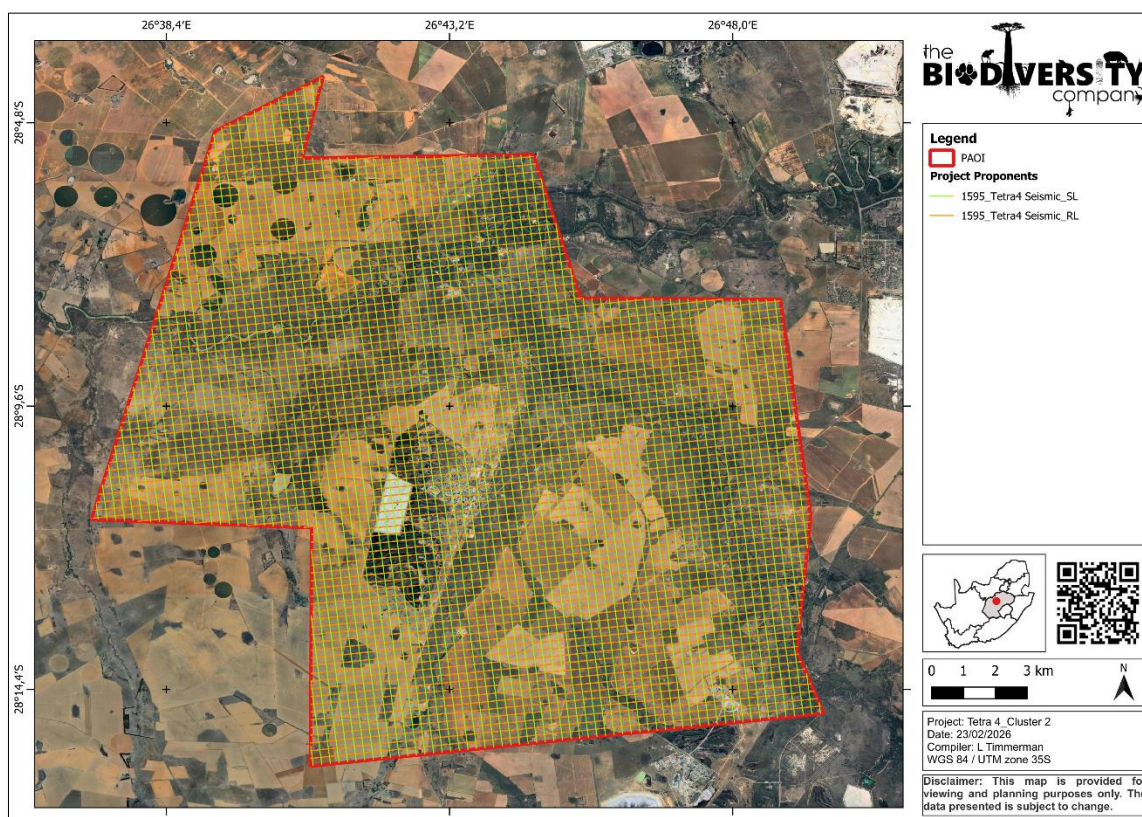
- Terrestrial Biodiversity Theme sensitivity is Very High;
- Plant Species Theme sensitivity is Low; and
- Animal Species Theme sensitivity is Medium.

The purpose of conducting the specialist study is to provide relevant input into the Environmental Authorisation application process, with a focus on the proposed activities and the impacts associated with the project. This report, after taking into consideration the findings and recommendations provided by the specialist stipulated herein, should inform, and guide the Registered Environmental Assessment Practitioner (EAP) and regulatory authorities, enabling informed decision making as to the ecological viability of the proposed project.





**Figure 1-1** Map depicting the regional context of the Project Area of Influence (PAOI).



**Figure 1-2** Map depicting the local context of the Project Area of Influence (PAOI).

## 1.2 Project Description and Technical Information

Following the successful commencement of Cluster 1 gas production in 2022, Tetra4 applied for relevant environmental approvals to expand natural gas operations within the approved production right area and around the Cluster 1 project, designated as Cluster 2. The Cluster 2 application area ca. 27 500 hectares, overlaps with a large part of the Cluster 1 area (Figure 1-3). The expansion involves up to 300 new production wells, ca. 480 km of gas transmission pipelines and associated infrastructure, three compressor stations, and an additional new combined Liquefied Natural Gas (LNG) and Liquid Helium (LHe) plant (LNG/LHe Plant) as part of the Cluster 2 expansion to meet future production requirements. The Environmental Authorisation (EA) for the Cluster 2 expansion was granted on 19<sup>th</sup> of May 2023 (Ref: 12/4/007) by the Department of Mineral Resources and Energy (DMRE).

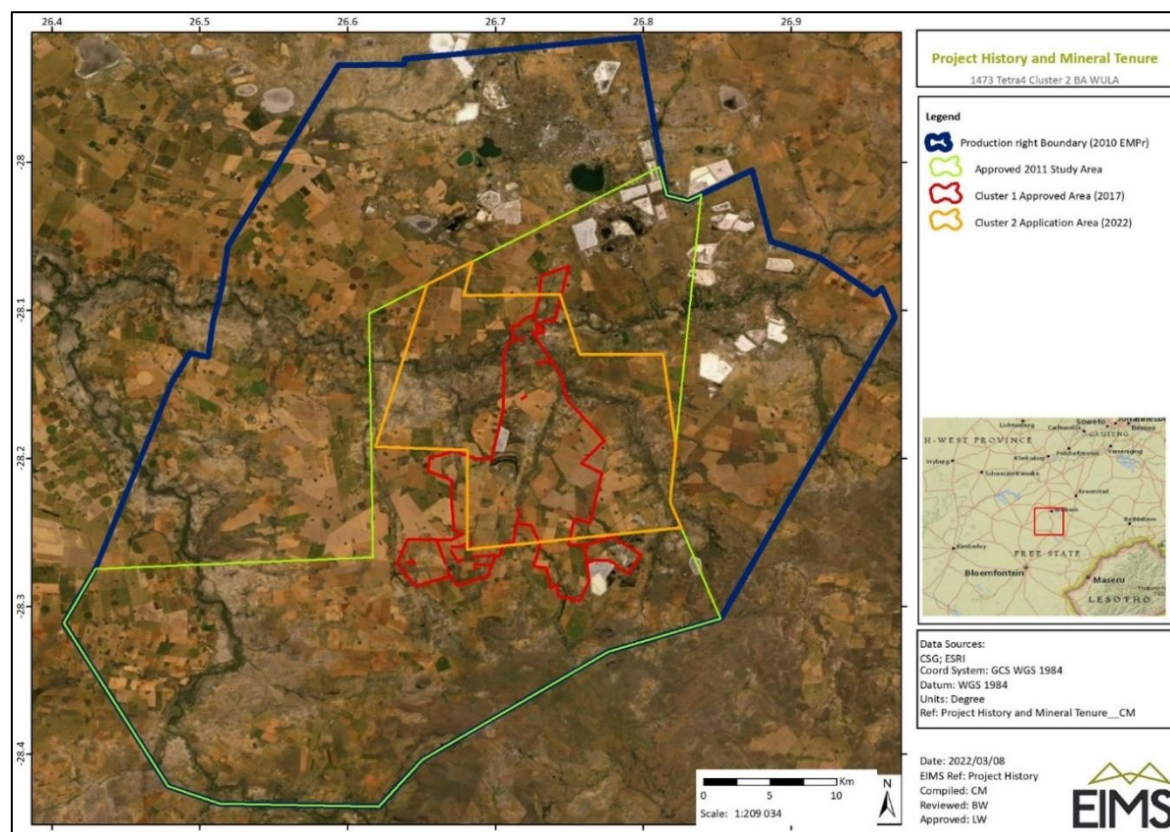
The Cluster 2 EA authorised various production well transects where drilling could occur, but did not specify exact drilling locations, resulting in some uncertainty and concerns from landowners. To address this, Tetra4 proposes conducting a 3D seismic survey across the Cluster 2 area. The primary objective of this survey is to collect detailed subsurface geological data, enabling Tetra4 to accurately identify optimal drilling locations for new natural gas wells and to address landowner concerns regarding well placement. The survey will be carried out using vibrosis/vibrator trucks and geophones (Figure 1-6 and Figure 1-6), with fieldwork planned to be completed within three months and an ca. 425 source points surveyed per day. This high-resolution subsurface geological profile will allow Tetra4 to visualise gas placement in the sub-surface and more accurately identify points of interest on properties.

Onshore seismic surveys are a listed activity in terms of the National Environmental Management Act (Act 107 of 1998 - NEMA) and therefore require a separate EA from the DMRE. The 2023 Cluster 2 EA did not include the listed activity for onshore seismic surveys, nor was an assessment of this activity undertaken during the associated Environmental Impact Assessment. As such, a new EA application is required for the proposed seismic survey. The data obtained from this survey will guide the future development of up to 300 new wells, associated pipelines, compressor stations, and the LNG/LHe plant within the approved production area, ensuring responsible and efficient resource extraction.

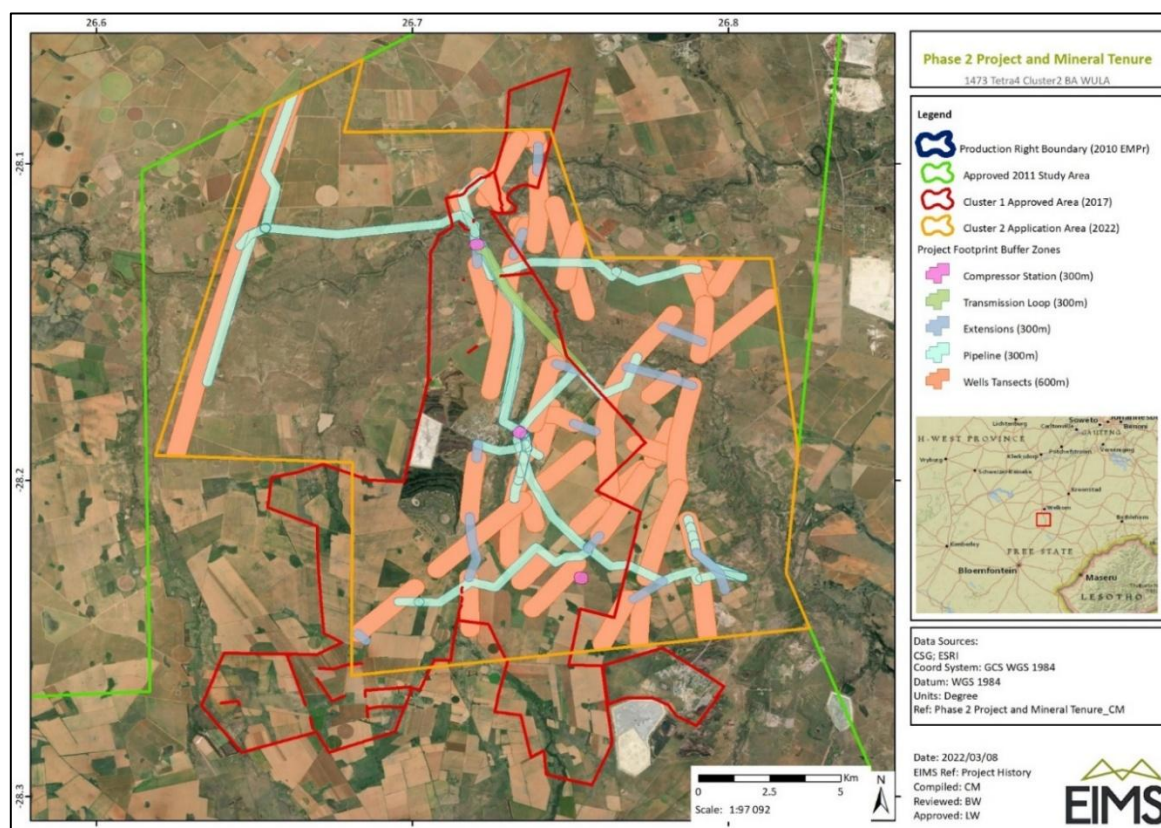
Tetra4 holds a natural gas production right over a large area in the Free State Province, near Virginia, and has existing environmental authorisation and a water use licence for current production activities (Cluster 1). The planned expansions will include (Figure 1-4):

- Expansions to the current LNG and Helium production plant on the Farm Mond van Doorn Rivier, increasing production capacities significantly (by ca. 30-fold) and expanding the plant footprint by ca. 10 ha;
- Drilling of ca. 300 new gas wells across the Cluster 2 study area (ca. 27 500 ha);
- Installation of trenched pipelines connecting wells to booster compressors, then to in-field compressor stations (about three sites), and subsequently to the main plant area; and
- Short powerline and water connections to the compressor sites.





**Figure 1-3** Project history and mineral tenure provided by EIMS (2023).



**Figure 1-4** Cluster 2 study area and proposed infrastructure footprint buffer zones provided by EIMS (2023).





**Figure 1-5** Images of 12-ton source truck (minivibrator) provided by EIMS (2023).



**Figure 1-6** Geophone unit to be utilised for seismic acquisition provided by EIMS (2023)

### 1.3 Scope of Work

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

- Desktop assessment to identify the ecologically important terrestrial biodiversity features within the PAOI;
- Desktop assessment to identify possible Flora and Fauna Species of Conservation Concern (SCC) that may occur within the PAOI;
- Field survey to identify flora and fauna species, (especially SCC) within the PAOI;
- Determine the Site Ecological Importance (SEI), also commonly referred to as the sensitivity of the PAOI;
- Identify the manner that the proposed development impacts the features and evaluate the level of risk of these potential impacts; and
- The prescription of mitigation measures for identified risks associated with the proposed development.

### 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;
- All datasets accessed and utilised for this assessment are considered to be representative of the most recent and suitable data for the intended purposes;
- Insects and invertebrates do not form part of the scope of work for this assessment;
- The assessment area (PAOI) 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;
- The project description was based on information provided by the client/EAP, and any alterations to the area and/or missing data pertaining to the development would have affected the area surveyed and hence the results of this assessment;
- Different portions of the PAOI were not assessed due to access limitations;
- Whilst every effort was made to cover as much of the PAOI as possible, representative sampling was completed. Consequently, it is possible that some fauna and flora species present within the PAOI may have not been recorded during the field survey;
- 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;
- The Compliance Statement provided in this report is strictly contingent upon the complete avoidance of all areas classified as Medium (*viz.* Degraded Grassland Sensitive Species and Water Resources and Buffers) Sensitivity Ecological Importance (SEI) within the Cluster 2 PAOI. This statement is based solely on areas designated as Very Low SEI, specifically Degraded Grassland, Disturbed Grassland, and Transformed habitats; and

- It is essential that an updated layout of the PAOI be delineated to clearly demonstrate the avoidance of Medium SEI habitats. The avoidance of Disturbed Grassland Sensitive Species, Water Resources and Buffers is a prerequisite for this Compliance Statement to remain valid and;
- All delineations presented in this report are based on the previous assessment conducted in May 2022 by TBC. For any information pertaining to water resources and aquatic systems, please refer to the accompanying reports (TBC, 2026).

## 1.5 Legislative Framework

In line with the protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity, as per Government Notice 320 published in terms of NEMA, dated 20 March 2020 and 30 October 2020: “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, when applying for Environmental Authorisation” – section 3, subsection 1:

- An applicant intending to undertake an activity identified in the scope of the protocol, on a site identified on the screening tool as being of ‘Very High’ sensitivity for terrestrial biodiversity, must submit a Terrestrial Biodiversity Specialist Assessment; however
  - Where the information gathered from the site sensitivity verification differs from the designation of ‘Very High’ terrestrial biodiversity sensitivity on the screening tool and it is found to be of a ‘Low’ sensitivity, then a Terrestrial Biodiversity Compliance Statement must be submitted;
- An applicant intending to undertake an activity identified in the scope of this protocol, on a site identified by the screening tool as being of “Low” sensitivity for terrestrial plant species, must submit a Terrestrial Plant Species Compliance Statement;
- An applicant intending to undertake an activity identified in the scope of this protocol on a site identified by the screening tool as being of “Medium sensitivity” for terrestrial animal species must submit either a Terrestrial Animal Species Specialist Assessment Report or a Terrestrial Animal Species Compliance Statement, depending on the outcome of a site inspection undertaken in accordance with:
- Similarly, where no SCC are found on site during the site inspection or the presence is confirmed to be unlikely, a Terrestrial Animal Species Compliance Statement must be submitted.

The information obtained from a site sensitivity verification, which involved both a desktop assessment as well as a two field surveys, confirmed that the proposed PAOI is of a ‘Very Low’ sensitivity. **It is important to note that this conclusion is only applicable if the Medium SEI habitat unit is avoided. Should any activities enter or impact the Medium SEI habitat unit, a Terrestrial Biodiversity Assessment will be required and must be submitted in accordance with the relevant protocols.** Therefore, this report constitutes a Compliance Statement<sup>1</sup>. As per sections 2 and 3 of the protocol discussed above, a Compliance Statement must contain the information as presented in Table 1-1 below.

<sup>1</sup> A signed copy of the compliance statement must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.

**Table 1-1** *Compliance Statement information requirements as per the relevant protocol, including the location of the information within this report.*

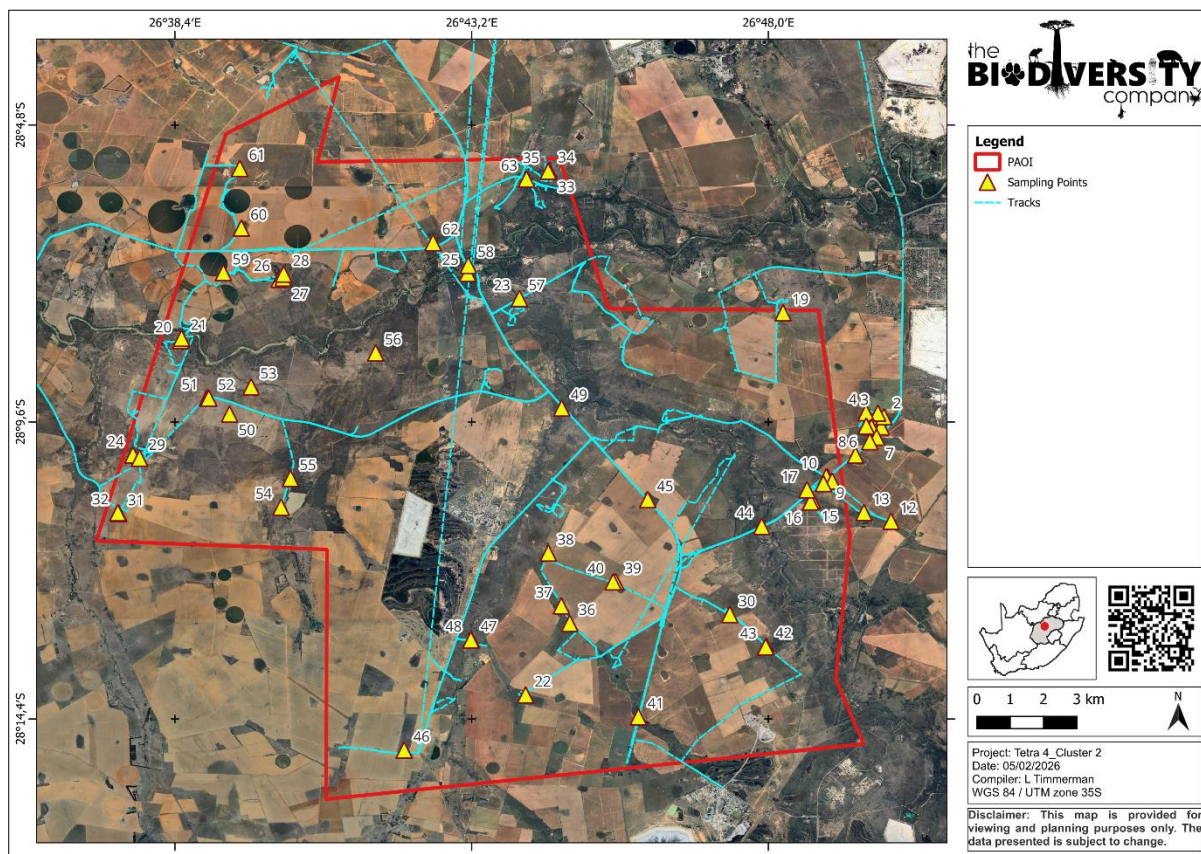
Information to be Included (as per GN 320, 20 March 2020 and GN 1150, 30 October 2020)	Report Section
Methodology used to undertake the site assessment and survey, and prepare the compliance statement, including relevant equipment and modelling used	7.1
Description of the assumptions and any uncertainties or gaps in knowledge or data	1.4
A baseline profile description of biodiversity and ecosystems of the site	3.2
Site sensitivity verification: Desktop Analysis using satellite imagery and available information	3.1.1
A statement on the duration, date, and season of the site inspection	2
Site sensitivity verification: Onsite inspection, including a description of current land use and vegetation found on-site	3.3
Site sensitivity verification: Photographs/evidence of environmental sensitivity	3.2
Screening tool confirmation/dispute: The assessment must verify the “Low” sensitivity of the site, in terms of plant, animal, and terrestrial biodiversity themes	3.3.2
Proposed impact management outcomes or monitoring requirements for inclusion in the EMPr	4
Indicate whether the proposed development will have any impact on the terrestrial environment, animals and/or plants	5
A signed statement of independence by the specialist	7.3
Specialist details, including a CV	7.4



## 2 Fieldwork

### 2.1 Field Assessment

The initial field survey for the proposed project was conducted in March 2022. To supplement and update the baseline data, a second field survey was undertaken on 2<sup>nd</sup> of February 2026. Effort was made to cover all the different habitat types within the PAOI, within the limits of time, access, and security (Figure 2-1). The field surveys for this assessment were conducted during the optimal sampling period for the Grassland Biome, as stipulated in the Species Environmental Assessment Guideline (2022, p. 57). This timing ensured that the survey results are representative of the site's ecological conditions.



**Figure 2-1** Map depicting the survey points and field tracks within the entire PAOI.



### 3 Results & Discussion

#### 3.1 Desktop Baseline

##### 3.1.1 Ecologically Important Landscape Features

Table 3-1 below has been produced because of the spatial data collected and analysed (as provided by various sources such as the national and provincial environmental authorities and South African National Biodiversity Institute [SANBI]). It presents a summative breakdown of the ecological boundaries considered and the associated relevance that each has to the region or PAOI. Where a feature is regarded as relevant it is considered an ecologically important landscape feature and discussed further as part of the sub-sections that follow.

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

Desktop Information Considered	Relevance	Reasoning
Provincial Conservation Plan [Free State Biodiversity Plan CBA (DESTE), 2015]	Relevant	Intersects with Critical Biodiversity Area (CBA) 1, CBA2, Ecological Support Area (ESA) 1 and ESA2
Ecosystem Threat Status [Red list of Ecosystems (RLE), 2021]	Relevant	Located within an Endangered (EN) and Least Concerned (LC) ecosystem
Ecosystem Protection Level (NBA, 2018)	Relevant	Located within a Not Protected (NP) and a Poorly Protected (PP) ecosystem
National Protected Areas Expansion Strategy (NPAES, 2018)	Relevant	Southeast corner of PAOI overlaps with Priority Focus Area
South African Protected and Conservation Areas Databases (SAPAD & SACAD, 2024)	Relevant	The PAOI is within 5 km from SAPAD Areas (viz. H. J. Joel Private Nature Reserve). No SACAD Areas are located within 10 km of the PAOI
Key Biodiversity Areas (KBA, 2024)	Irrelevant	The PAOI is located ca. 146 km from the nearest KBA (viz. Golden Gate)
Strategic Water Source Areas (SWSA, 2021)	Irrelevant	The PAOI is located ca. 122 km from the nearest SWSA (viz. Maloti Drakensberg)
South African Inventory of Inland Aquatic Ecosystems (SAIIAE, 2018)	Relevant	There are SAIIAE wetlands recorded within 500 m of the PAOI. Depressions (PP), Channelled Valley-Bottom (NP) and Seep (NP) can be found within and around the PAOI. Additionally, three rivers (viz. Sand, Doring and Bosluisspruit) overlap with the PAOI. The Depressions are listed as 'Least Concern' (LC), Channelled Valley-Bottom and Seep are listed as 'Critical' (CR)
National Freshwater Priority Areas (NFEPA, 2011)	Relevant	There are FEPA wetlands recognised within 500 m of the PAOI. These included Channelled Valley-Bottom, Depression, Flat, Floodplain, River Channel, Seep, Unchannelled Valley-Bottom and Valleyhead Seep

##### 3.1.2 Flora Species of Conservation Concern

The Screening Tool indicates that no flora SCC are predicted to occur within the PAOI. Further, no flora SCC were confirmed during the site survey and none are likely to occur.

##### 3.1.2.1 Protected and SCC Flora Species Observed During the 2022 Assessment

The Terrestrial Ecology Assessment for the proposed Tetra 4 Cluster 2 Project (TBC, 2022) recorded seven (7) protected and one (1) SCC flora species in various parts of the PAOI. Table 3-2 provides a list protected flora observed. These species are protected under the Free State Nature Conservation Ordinance 8 of 1969. According to the list of protected species under Schedule 6, if any individuals of these flora species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTE).

**Table 3-2 Protected and SCC flora recorded within the PAOI during the 2022 assessment. LC = Least Concern and NT = Near Threatened.**

Family	Scientific Name	Threat Status (SANB)	SA Endemic
Amaryllidaceae	<i>Ammocharis coranica</i>	LC-Schedule 6 Protected	Not Endemic
Amaryllidaceae	<i>Boophone disticha</i>	LC-Schedule 6 Protected	Not Endemic
Asparagaceae	<i>Eucomis autumnalis</i>	LC-Schedule 6 Protected	Not Endemic
Asphodelaceae	<i>Aloe dominella</i>	Near Threatened B1ab(ii,iii,v) (-Schedule 6 Protected)	Endemic
Hyacinthaceae	<i>Schizocarpus nervosus</i>	LC-Schedule 6 Protected	Not Endemic
Iridaceae	<i>Gladiolus crassifolius</i>	LC-Schedule 6 Protected	Not Endemic
Iridaceae	<i>Gladiolus permealilis</i>	LC-Schedule 6 Protected	Endemic

### 3.1.3 Fauna Species of Conservation Concern

The Screening Tool indicates that one (1) mammal, two (2) avifauna, and one (1) sensitive species, SCC are predicted to occur within the PAOI. According to the list of protected species under Schedule 6, if any individuals of these flora species are to be disturbed, permits must be obtained from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA). Further, one (1) fauna SCC below were confirmed during the May 2022 site survey.

Please note that the Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly, and plant SCC known or expected to occur in the proposed development footprint. Some of these SCCs 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 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*.

**Table 3-3 List of mammal Species of Conservation Concern that may occur in the PAOI. Endangered = EN, Least Concern = LC, NT = Near Threatened and VU = Vulnerable.**

Scientific Name	Common Name	Screening Tool Designation	Conservation Status		Habitat	Likelihood of Occurrence	Reason
			SANBI	IUCN			
Mammals							
<i>Hydricitis maculicollis</i>	Spotted-necked Otter	Medium	VU	NT	Unpolluted freshwater habitats rich in small fishes	Moderate	Some suitable habitat on site
Reptile							
<i>Sensitive species 15</i>	-	Medium	VU	VU	-	Confirmed	-
Avifauna							
<i>Circus ranivorus</i>	African Marsh Harrier	Medium	VU	LC	Coastal and inland wetlands, but may use adjacent grassland and croplands when foraging	Moderate	Some suitable habitat on site
<i>Hydroprogne caspia</i>	Caspian Tern	Medium	VU	LC	Natural and man-made waterbodies, showing preference for saline pans and	Low	Minimal suitable habitat

large  
impoundments

### 3.1.3.1 Protected and SCC Fauna Species Observed During the 2022 Assessment

The Terrestrial Ecology Assessment for the proposed Tetra 4 Cluster 2 Project (TBC, 2022) recorded eighty-eight (88) fauna species within the PAOI. Of these, some species are protected under the Free State Nature Conservation Ordinance 8 of 1969, while others are classified as SCC (Table 3-4).

**Table 3-4 Protected and SCC fauna recorded within the PAOI during the 2022 assessment.**

Species	Common Name	Conservation Status		Free State Ordinance 8 of 1969	Nature Conservation
		Regional (SANBI, 2016)	IUCN (2021)		
Avifauna					
<i>Afrotis afraoides</i>	Korhaan, Northern Black	Unlisted	LC		Schedule 1 Protected
<i>Alopochen aegyptiaca</i>	Goose, Egyptian	Unlisted	LC		Schedule 1/2 Protected
<i>Amadina erythrocephala</i>	Finch, Red-headed	Unlisted	LC		Schedule 1 Protected
<i>Anas erythrorhyncha</i>	Teal, Red-billed	Unlisted	LC		Schedule 1 Protected
<i>Anas sparsa</i>	Duck, African Black	Unlisted	LC		Schedule 1 Protected
<i>Anas undulata</i>	Duck, Yellow-billed	Unlisted	LC		Schedule 1/2 Protected
<i>Anhinga rufa</i>	Darter, African	Unlisted	LC		Schedule 1 Protected
<i>Apus apus</i>	Swift, Common	Unlisted	LC		Schedule 1 Protected
<i>Ardea cinerea</i>	Heron, Grey	Unlisted	LC		Schedule 1 Protected
<i>Ardea intermedia</i>	Egret, Yellow-billed (Intermediate)	Unlisted	LC		Schedule 1 Protected
<i>Ardea melanocephala</i>	Heron, Black-headed	Unlisted	LC		Schedule 1 Protected
<i>Ardea purpurea</i>	Heron, Purple	Unlisted	LC		Schedule 1 Protected
<i>Ardeola ralloides</i>	Heron, Squacco	Unlisted	LC		Schedule 1 Protected
<i>Asio capensis</i>	Owl, Marsh	Unlisted	LC		Schedule 1 Protected
<i>Bostrychia hagedash</i>	Ibis, Hadedda	Unlisted	LC		Schedule 1 Protected
<i>Bubulcus ibis</i>	Egret, Cattle	Unlisted	LC		Schedule 1 Protected
<i>Burhinus capensis</i>	Thick-knee, Spotted	Unlisted	LC		Schedule 1 Protected
<i>Buteo buteo</i>	Buzzard, Common (Steppe)	Unlisted	LC		Schedule 1 Protected
<i>Buteo rufofuscus</i>	Buzzard, Jackal	Unlisted	LC		Schedule 1 Protected
<i>Charadrius tricollaris</i>	Plover, Three-banded	Unlisted	LC		Schedule 1 Protected
<i>Chlidonias hybrida</i>	Tern, Whiskered	Unlisted	LC		Schedule 1 Protected
<i>Chlidonias leucopterus</i>	Tern, White-winged	Unlisted	LC		Schedule 1 Protected
<i>Chrysococcyx caprius</i>	Cuckoo, Diderick	Unlisted	LC		Schedule 1 Protected
<i>Circus macrourus</i>	Harrier, Pallid	NT	NT		Schedule 1 Protected
<i>Coracias caudatus</i>	Roller, Lilac-breasted	Unlisted	LC		Schedule 1 Protected
<i>Corythornis cristatus</i>	Kingfisher, Malachite	Unlisted	Unlisted		Schedule 1 Protected
<i>Cursorius temminckii</i>	Courser, Temminck's	Unlisted	LC		Schedule 1 Protected
<i>Dendrocygna viduata</i>	Duck, White-faced Whistling	Unlisted	LC		Schedule 1 Protected
<i>Egretta ardesiaca</i>	Heron, Black	Unlisted	LC		Schedule 1 Protected
<i>Egretta garzetta</i>	Egret, Little	Unlisted	LC		Schedule 1 Protected
<i>Elanus caeruleus</i>	Kite, Black-shouldered	Unlisted	LC		Schedule 1 Protected
<i>Estrilda astrild</i>	Waxbill, Common	Unlisted	LC		Schedule 1 Protected

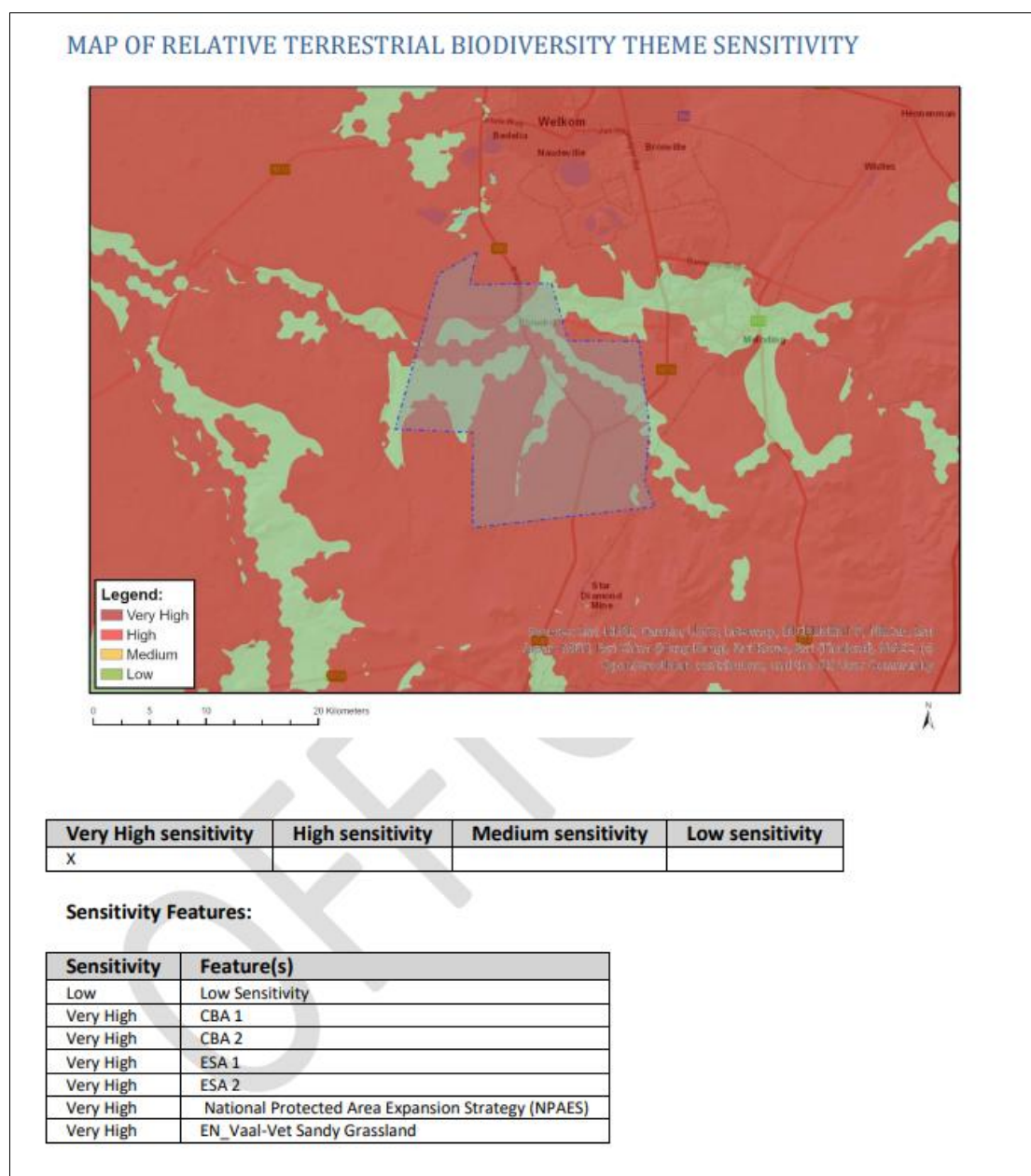
## Tetra 4 Cluster 2

<i>Falco amurensis</i>	Falcon, Amur	Unlisted	LC	Schedule 1 Protected
<i>Falco rupicolus</i>	Kestrel, Rock	Unlisted	LC	Schedule 1 Protected
<i>Fulica cristata</i>	Coot, Red-knobbed	Unlisted	LC	Schedule 1 Protected
<i>Himantopus himantopus</i>	Stilt, Black-winged	Unlisted	LC	Schedule 1 Protected
<i>Hirundo dimidiata</i>	Swallow, Pearl-breasted	Unlisted	LC	Schedule 1 Protected
<i>Lanius collaris</i>	Fiscal, Common (Southern)	Unlisted	LC	Schedule 1 Protected
<i>Lanius minor</i>	Shrike, Lesser Grey	Unlisted	LC	Schedule 1 Protected
<i>Lybius torquatus</i>	Barbet, Black-collared	Unlisted	LC	Schedule 1 Protected
<i>Melierax canorus</i>	Goshawk, Southern Pale Chanting	Unlisted	LC	Schedule 1 Protected
<i>Merops apiaster</i>	Bee-eater, European	Unlisted	LC	Schedule 1 Protected
<i>Microcarbo africanus</i>	Cormorant, Reed	Unlisted	LC	Schedule 1 Protected
<i>Mirafr africana</i>	Lark, Rufous-naped	Unlisted	LC	Schedule 1 Protected
<i>Myrmecocichla formicivora</i>	Chat, Anteating	Unlisted	LC	Schedule 1 Protected
<i>Netta erythrophthalma</i>	Pochard, Southern	Unlisted	LC	Schedule 1 Protected
<i>Numida meleagris</i>	Guineafowl, Helmeted	Unlisted	LC	Schedule 1/2 Protected
<i>Nycticorax nycticorax</i>	Night-Heron, Black-crowned	Unlisted	LC	Schedule 1 Protected
<i>Oena capensis</i>	Dove, Namaqua	Unlisted	LC	Schedule 1 Protected
<i>Oxyura maccoa</i>	Duck, Maccoa	NT	VU	Schedule 1 Protected
<i>Phoenicopterus roseus</i>	Flamingo, Greater	NT	LC	Schedule 1 Protected
<i>Phoeniculus purpureus</i>	Wood-hoopoe, Green	Unlisted	LC	Schedule 1 Protected
<i>Platalea alba</i>	Spoonbill, African	Unlisted	LC	Schedule 1 Protected
<i>Plectropterus gambensis</i>	Goose, Spur-winged	Unlisted	LC	Schedule 1/2 Protected
<i>Plegadis falcinellus</i>	Ibis, Glossy	Unlisted	LC	Schedule 1 Protected
<i>Podiceps nigricollis</i>	Grebe, Black-necked	Unlisted	LC	Schedule 1 Protected
<i>Prinia flavicans</i>	Prinia, Black-chested	Unlisted	LC	Schedule 1 Protected
<i>Pternistis swainsonii</i>	Spurfowl, Swainson's	Unlisted	LC	Schedule 1/2 Protected
<i>Rhinoptilus africanus</i>	Courser, Double-banded	Unlisted	LC	Schedule 1 Protected
<i>Sagittarius serpentarius</i>	Secretarybird	VU	EN	Schedule 1 Protected
<i>Saxicola torquatus</i>	Stonechat, African	Unlisted	LC	Schedule 1 Protected
<i>Spatula hottentota</i>	Teal, Hottentot	Unlisted	LC	Schedule 1 Protected
<i>Spatula smithii</i>	Shoveler, Cape	Unlisted	LC	Schedule 1 Protected
<i>Sturnus vulgaris</i>	Starling, Common	Unlisted	LC	Schedule 1 Protected
<i>Tachybaptus ruficollis</i>	Grebe, Little	Unlisted	LC	Schedule 1 Protected
<i>Telophorus zeylonus</i>	Bokmakierie, Bokmakierie	Unlisted	LC	Schedule 1 Protected
<i>Trachyphonus vaillantii</i>	Barbet, Crested	Unlisted	LC	Schedule 1 Protected
<i>Tringa stagnatilis</i>	Sandpiper, Marsh	Unlisted	LC	Schedule 1 Protected
<i>Tyto alba</i>	Owl, Barn	Unlisted	LC	Schedule 1 Protected
<i>Upupa africana</i>	Hoopoe, African	Unlisted	LC	Schedule 1 Protected
<i>Uraeginthus angolensis</i>	Waxbill, Blue	Unlisted	LC	Schedule 1 Protected
<i>Urocolius indicus</i>	Mousebird, Red-faced	Unlisted	LC	Schedule 1 Protected
<i>Vanellus armatus</i>	Lapwing, Blacksmith	Unlisted	LC	Schedule 1 Protected

## Tetra 4 Cluster 2

<i>Vanellus coronatus</i>	Lapwing, Crowned	Unlisted	LC	Schedule 1 Protected
<i>Vidua macroura</i>	Whydah, Pin-tailed	Unlisted	LC	Schedule 1 Protected
<b>Mammals</b>				
<i>Antidorcas marsupialis</i>	Springbok	LC	LC	Schedule 2-Protected
<i>Aonyx capensis</i>	Cape Clawless Otter	NT	NT	-
<i>Connochaetes taurinus</i>	Blue Wildebeest	LC	LC	Schedule 2-Protected
<i>Damaliscus pygargus</i>	Blesbok	LC	LC	Schedule 2-Protected
<i>Giraffa camelopardalis</i>	Giraffe	LC	VU	Schedule 2-Protected
<i>Leptailurus serval</i>	Serval	NT	LC	-
<i>Lepus saxatilis</i>	Scrub Hare	LC	LC	Schedule 2-Protected
<i>Parahyaena brunnea</i>	Brown Hyaena	NT	NT	-
<i>Raphicerus campestris</i>	Steenbok	LC	LC	Schedule 2-Protected
<i>Sylvicapra grimmia</i>	Common Duiker	LC	LC	Schedule 2-Protected
<i>Tragelaphus strepsiceros</i>	Greater Kudu	LC	LC	Schedule 2-Protected
<b>Reptiles</b>				
<i>Sensitive Species 15</i>	-	VU	VU	Schedule 1 Protected
<b>Amphibians</b>				
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	NT	LC	-

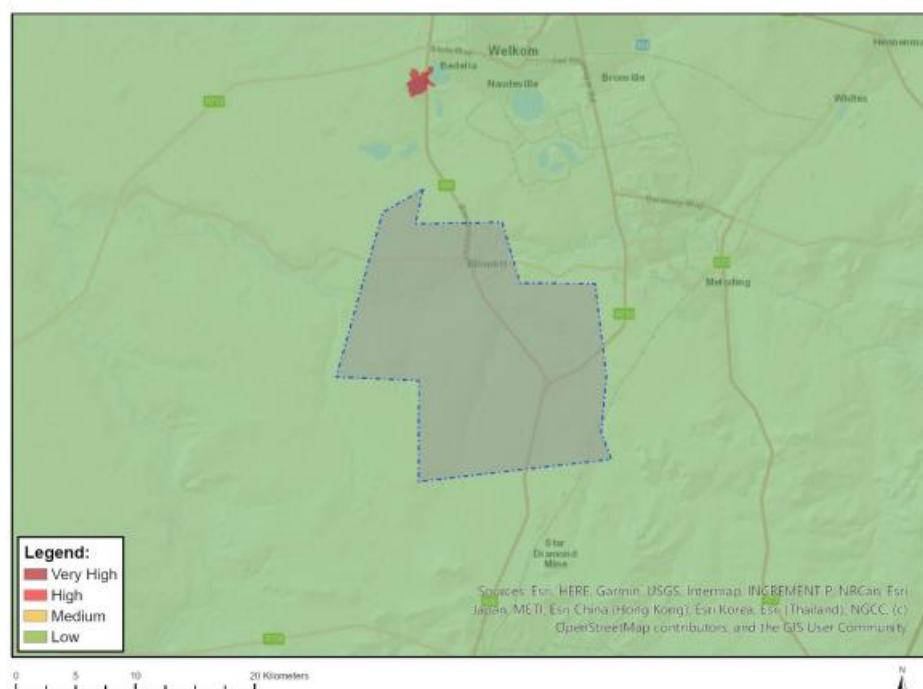
- Terrestrial Biodiversity Theme sensitivity is 'Very High' for the PAOI due to the presence of a CBA 1, CBA 2, ESA 1, ESA 2, NPAES and the Endangered Vaal Vet Sandy Grassland vegetation type (Figure 3-1);
- Plant Species Theme sensitivity is 'Low' for the PAOI (Figure 3-2); and
- Animal Species Theme sensitivity is 'Medium' for the PAOI owing to the potential occurrence of four (4) SCC [*viz.* one (1) mammal, two (2) avifauna and one (1) *Sensitive species*] (Figure 3-3).



**Figure 3-1** Map from DFFE Screening Tool Report depicting the relative terrestrial biodiversity theme sensitivity for the PAOI.



### 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 [biadatarequests@sanbi.org.za](mailto:biadatarequests@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.

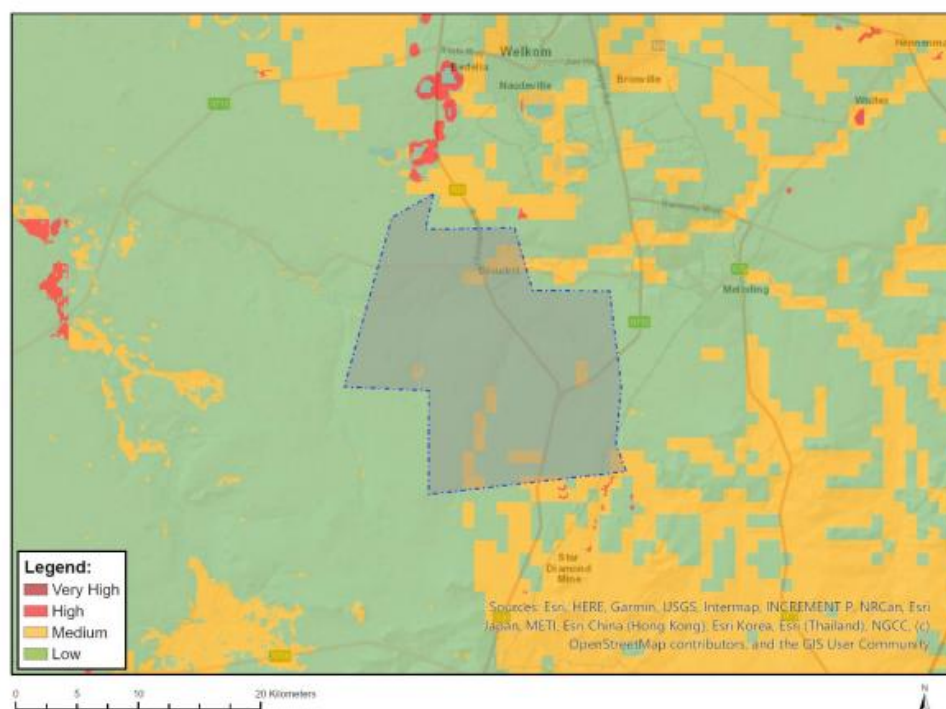
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

#### Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

**Figure 3-2** Map from DFFE Screening Tool Report depicting the relative plant species theme sensitivity for the PAOI.

### 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 [eladatarequests@sanbi.org.za](mailto:eladatarequests@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-Circus ranivorus
Medium	Aves-Hydroprogne caspia
Medium	Mammalia-Hydrictris maculicollis
Medium	Sensitive species 15

**Figure 3-3** Map from DFFE Screening Tool Report depicting the relative animal species theme sensitivity for the PAOI.



### 3.2 Biodiversity Field Survey

#### 3.2.1 Field points

The following sections discuss the results from the two field surveys that were conducted for the proposed project. Habitats observed at certain field points are described in Table 3-5.

**Table 3-5 Sensitivity summary of the habitat types delineated within the PAOI.**

Habitat	Description and condition	Ecosystem Processes and Services	Site Ecological Importance (SEI)
<b>Degraded Grassland and Degraded Grassland No-Go</b>	<p>The Degraded Grassland habitat unit within the PAOI is degraded primarily across two vegetation types [viz. Vaal-Vet Sandy Grassland and the Highveld Alluvial vegetation unit]. This habitat is considered semi-natural but is notably degraded due to a combination of historic and ongoing pressures, including fragmentation, overgrazing by livestock, and human activities, particularly near roads. The degree of disturbance varies across the unit, with some areas experiencing more severe degradation, often linked to overgrazing or proximity to anthropogenic influences.</p>	<p>Despite the disturbances, the habitat maintains largely intact ecological functioning, particularly for faunal communities. It acts as a greenland, providing essential habitat, foraging areas, and movement corridors for a variety of fauna, including small mammals, reptiles, and ground-dwelling birds. The mix of grasses and shrubs offers forage, while plant clumps provide shade and shelter, supporting the survival of these species.</p>	Very Low and Medium
	<p>Despite these disturbances, the habitat retains a suite of dominant indigenous plant species characteristic of the region, such as <i>Asparagus laricin</i>, <i>Vachellia karroo</i>, <i>Searsia pyroides</i>, <i>Searsia lancea</i>, and <i>Ziziphus mucronata</i>. In areas closer to the Vaal-Vet Sandy Grassland, there is an increased presence of <i>Themeda triandra</i> and other herbaceous species, though the habitat overall is more representative of Highveld Alluvial vegetation in some patches. The presence of AIP species - including <i>Verbena incompta</i>, <i>Verbena litoralis</i>, <i>Oxalis corniculata</i>, <i>Tagetes minuta</i>, <i>Lactuca serriola</i>, and <i>Zinnia peruviana</i> - as well as edge effects, have further reduced habitat integrity, particularly impacting floral communities.</p>	<p>Key ecosystem processes supported by this habitat include primary production, soil stabilization, nutrient cycling, and water regulation, all of which are enhanced by the remaining vegetation cover. The Degraded Grassland unit is also closely connected to water resource habitats, further underscoring its importance for hydrological processes and landscape connectivity.</p>	
	<p>While the flora community is no longer fully representative of reference vegetation due to ongoing and historic disturbances, the habitat still maintains elements of ecological function. The condition of the habitat is inconsistent, reflecting the varying intensity of land use and disturbance across the unit. Notably, one (1) reptile Sensitive Species 15 (SS15) were recorded in the northern section of the PAOI during the 2022 assessment. The species is listed as VU on both a regional and an international scale.</p>	<p>Although the habitat's plant community has been altered and is less representative of the reference state, the ecological services it provides remain significant. The sensitivity of the Degraded Grassland habitat reflects its crucial role in maintaining biodiversity within a highly fragmented landscape. The presence of AIP and edge effects may disrupt some ecological functions, such as pollination and seed dispersal, but the habitat's overall contribution to biodiversity, ecosystem resilience, and landscape connectivity remains substantial.</p>	
	<p>The Degraded Grassland unit overlaps with several conservation planning categories, including CBA1, CBA2, ESA1, ESA2, and NPAES, highlighting its ecological significance despite its altered state.</p>		



### Disturbed Grassland

The Disturbed Grassland habitat unit within the PAOI is found in both the Vaal-Vet Sandy Grassland and Highveld Alluvial vegetation units. This habitat has been significantly impacted by a combination of edge effects from adjacent modified or transformed areas, as well as direct anthropogenic pressures such as historic and ongoing overgrazing, vehicle ingress (including two-track roads), and other forms of human infringement. While not entirely transformed, these areas are in a persistent state of disturbance and are unable to recover to a more natural condition due to continual impacts from grazing, mismanagement, and harmful land use practices, including historic agriculture and dumping.

The habitat is characterised by a higher level of degradation than the Degraded habitat, however, it is not as severely altered as the Transformed habitat unit. Indigenous plant species such as *Vachellia karroo*, *Delosperma floribundum*, *Cymbopogon caesius*, *Asparagus laricinus*, and *Wahlenbergia undulata* are still present, but overall floral species richness is diminished as a result of ongoing anthropogenic influences.

Faunal species observed in this habitat include *Xerus inauris*, *Sylvicapra grimmia*, and *Raphicerus campestris*. The overall sensitivity of this habitat is considered medium, as it often serves as a buffer or barrier between more natural and more heavily transformed areas, and may be used as a movement corridor for fauna.

The ecological functioning and delivery of ecosystem services within the Disturbed habitat unit have been notably hindered by ongoing anthropogenic disturbances. Despite this, the habitat continues to provide several important ecosystem services. The remaining grass and shrub cover contributes to soil stabilization, helping to reduce both wind and water erosion. These areas also serve as movement corridors for a variety of fauna, supporting landscape connectivity even in a fragmented environment.

However, the persistent disturbances - such as overgrazing, vehicle ingress, dumping, and mismanagement - have led to a reduction in floral diversity and a decline in the overall health of ecological processes. The diminished plant community limits the habitat's capacity for natural regeneration and reduces the availability of resources for both flora and fauna. While the habitat is not entirely transformed, its ability to support robust ecosystem functioning is compromised, and its role is increasingly that of a transitional or buffer zone between more intact and more heavily altered landscapes. Nevertheless, the habitat remains ecologically significant for maintaining some level of biodiversity, providing erosion control, and facilitating wildlife movement within the Vaal-Vet Sandy Grassland and Highveld Alluvial regions.

Very Low



### Transformed

The Transformed habitat unit is the largest within the PAOI and is characterised by extensive alteration of the natural landscape, primarily as a result of historical and ongoing mining and agricultural activities, as well as the development of associated infrastructure such as roads and substations. This habitat unit is defined by a near-complete loss of natural vegetation

Ecological functioning and the provision of ecosystem services within the habitat unit have been severely degraded due to the extensive anthropogenic influences. The dominance of impermeable surfaces, manicured lawns, and infrastructure has resulted in the near-total loss of natural ecosystem processes such as nutrient cycling, water infiltration, and habitat

Very Low

cover, with the landscape now dominated by agricultural fields, infrastructure, and other impermeable surfaces. The transformation is so extensive that the habitat exists in a perpetually altered state, unable to recover to a more natural condition due to continuous disturbance and land use impacts.

No SCC were observed within this unit, nor are any expected, given the lack of suitable habitat and the dominance of non-native or highly disturbed environments. The habitat unit does not contribute to the ecological representation of the EN ecosystem and holds no conservation value from an ecological perspective.

Despite the overlap with conservation planning categories such as CBA1, CBA2, ESA1, ESA2, and NPAES, the current condition of this habitat precludes it from supporting significant biodiversity or functioning as a viable conservation area.

provision for native species. The remaining indigenous species are sparse, but may provide limited benefits to adjacent areas, such as wind-dispersed seeds that could potentially aid in the recolonization of nearby less-disturbed habitats.

The ecological services provided by this habitat are extremely limited. While certain sections may still function as movement corridors for locally common fauna, the overall capacity of the Transformed unit to support biodiversity, regulate water, or stabilize soil is minimal. The habitat's ongoing transformed state, driven by persistent agricultural and infrastructural activities, ensures that it remains ecologically compromised and unable to recover or contribute meaningfully to the broader landscape's ecological integrity.



The habitat unit within the PAOI encompasses a diverse array of aquatic and semi-aquatic features, including wetlands, rivers, and drainage systems. Notably, SAIIE wetlands are recorded within 500 meters of the PAOI, and several wetland types *viz.* Depressions (PP), Channelled Valley-Bottom (NP), and Seep (NP) are present both within and around the area. The conservation status of these wetlands varies, with Depressions listed as 'Least Concern' (LC), while Channelled Valley-Bottom and Seep wetlands are classified as 'Critical' (CR), highlighting their ecological importance and vulnerability.

The habitat unit plays a pivotal role in sustaining ecological processes and delivering a wide range of ecosystem services within the PAOI. Wetlands, rivers, and riparian zones contribute significantly to the hydrological cycle, supporting water balance through processes such as evapotranspiration and groundwater recharge. These systems are vital for water regulation, flood attenuation, and the maintenance of water quality.

#### Water Resources

Three rivers *viz.* Sand, Doring, and Bosluisspruit overlap with the PAOI, contributing to the hydrological complexity and ecological value of the area. The riparian zones associated with these rivers, particularly the Sand River and its tributaries, are characterised by riparian vegetation that, despite being in a relatively modified and poor condition due to invasive species, bank erosion, and overgrazing, still provide essential ecological functions.

These areas are subject to ongoing anthropogenic pressures, however retain high conservation value due to their role in supporting biodiversity and maintaining ecosystem processes.

Riparian and wetland habitats serve as critical corridors for faunal migration and dispersal, enhancing landscape connectivity and supporting the movement of both common and SCC. They provide essential habitat and foraging grounds for a diverse array of wildlife, including the Cape Clawless Otter and other species of conservation concern. The vegetation within these habitats stabilizes banks, reduces erosion, and filters pollutants, thereby maintaining the ecological health of the broader landscape.

Despite some disturbance from invasive species, erosion, and overgrazing, the ecological importance and functioning of these water resource systems remain high. Their preservation is essential, not only for maintaining biodiversity and ecosystem resilience but also for supporting the

Medium



The Water Resources habitat unit is considered to be of high ecological sensitivity. It provides unique habitats for a variety of faunal and floral species, including species of conservation concern viz. *Aonyx capensis* (NT), which has been previously recorded in the area. The ecological integrity and functioning of these water resource systems are crucial for the maintenance of local and regional biodiversity, as well as for the provision of essential ecosystem services.

livelihoods and well-being of surrounding communities. The high sensitivity of these areas, as indicated by various ecological datasets, underscores the need for their protection and enhancement, particularly in the context of any proposed development within the PAOI.

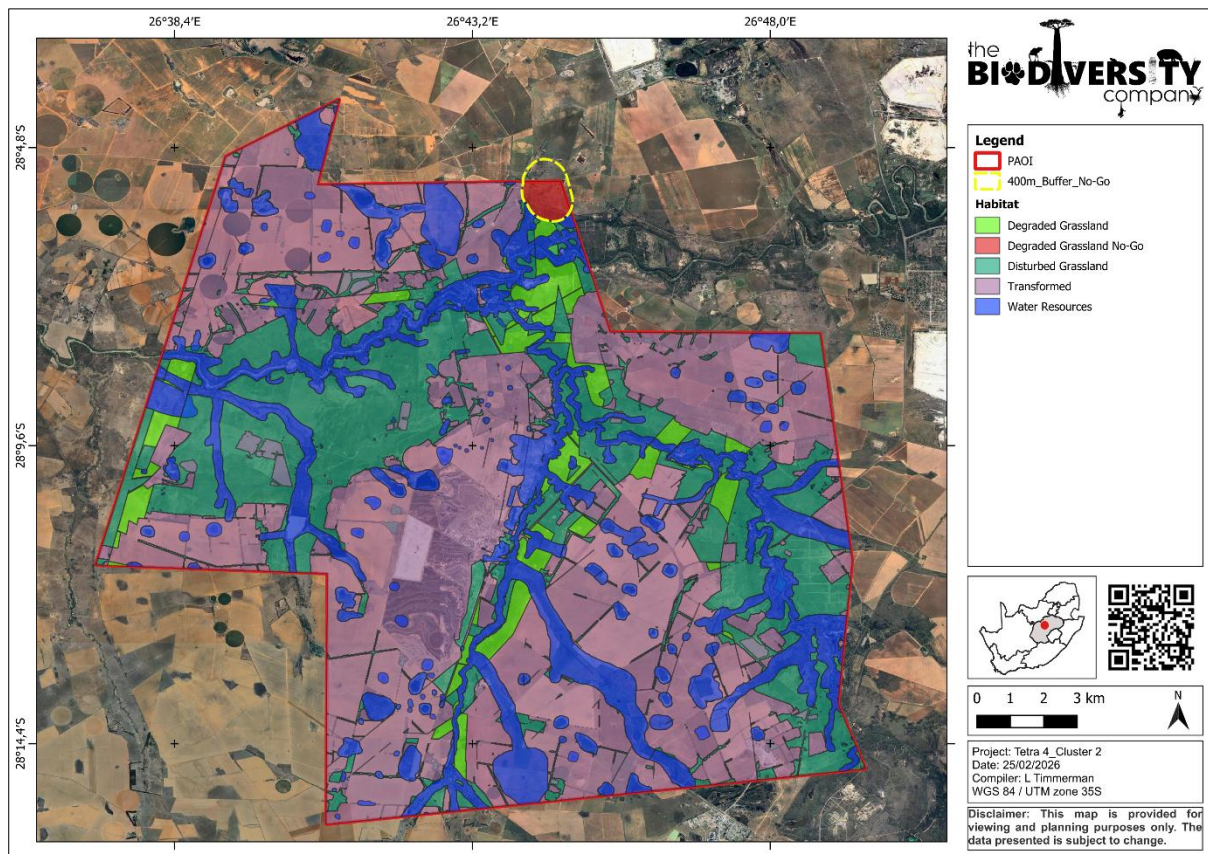
For further detail on the condition, sensitivity, and management recommendations for these systems, the accompanying Wetland - and Aquatic Report (TBC, 2026) should be consulted.



### 3.2.2 Habitat Assessment

Four (4) main habitat types were identified across the PAOI and include:

- Degraded Grassland;
- Disturbed Grassland;
- Transformed and
- Water resources and Buffers.
- The habitat units for the PAOI can be seen delineated in Figure 3-4 and a description of the habitat units can be found in Table 3-5.



**Figure 3-4**      *Habitats identified within the PAOI*

### 3.3 Site Sensitivity Verification

#### 3.3.1 Habitats and Site Ecological Importance (SEI)

Based on the criteria provided in Appendix B of this report, the habitat within the PAOI was assigned a sensitivity category, i.e., a SEI category. The habitat within the PAOI was classified SEI (Table 3-6 and Figure 3-5). The findings of this assessment therefore contradict the findings set forth by the Screening Tool with regards to the combined Terrestrial Biodiversity Theme Sensitivity.

**Table 3-6 Summary of habitat types and associated SEIs delineated within the PAOI.**

Habitat	Conservation Importance	Functional Integrity	Biodiversity Importance <sup>2</sup>	Project Components	Receptor Resilience	Site Ecological Importance <sup>3</sup>
<b>Degraded Grassland No-Go</b>	<b>High</b> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km <sup>2</sup> . IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.	<b>High</b> Large (> 20 ha but < 100 ha) intact area for any conservation status of ecosystem type or > 10 ha for EN ecosystem types	<b>High</b>	Seismic Survey Activities	<b>Low</b> 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.	<b>Very High</b> 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.
				Avoidance of Degraded Grassland No-Go <sup>4</sup> (NB: See footnote)	<b>High</b> 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.	<b>Medium</b> Minimisation and restoration mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.

<sup>2</sup> Considered as the 'sensitivity'.

<sup>3</sup> Considered as the sensitivity in relation to the project component. Subject to change depending on layout

<sup>4</sup> The increased resilience (High) is only relevant to the sensitivity of the receiving environment in relation to the avoidance of the Degraded Grassland No-Go habitat unit. This assumes that mitigation measures are prescribed and adhered to for these components.

<p><b>Degraded Grassland</b></p> <p><u>High</u> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of &gt; 10 km<sup>2</sup>. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.</p> <p><u>Medium</u> 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</p>	<p><b>Medium</b></p>	<p><u>Very High</u> Habitat that can recover rapidly (~ less than 5 years) to restore &gt; 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.</p> <p><u>Very Low</u> Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.</p>
<p><b>Disturbed Grassland</b></p> <p><u>Medium</u> &gt; 50% of receptor contains natural habitat with potential to support SCC</p> <p><u>Medium</u> 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</p>	<p><b>Medium</b></p>	<p><u>Very High</u> Habitat that can recover rapidly (~ less than 5 years) to restore &gt; 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.</p> <p><u>Very Low</u> Minimisation mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.</p>

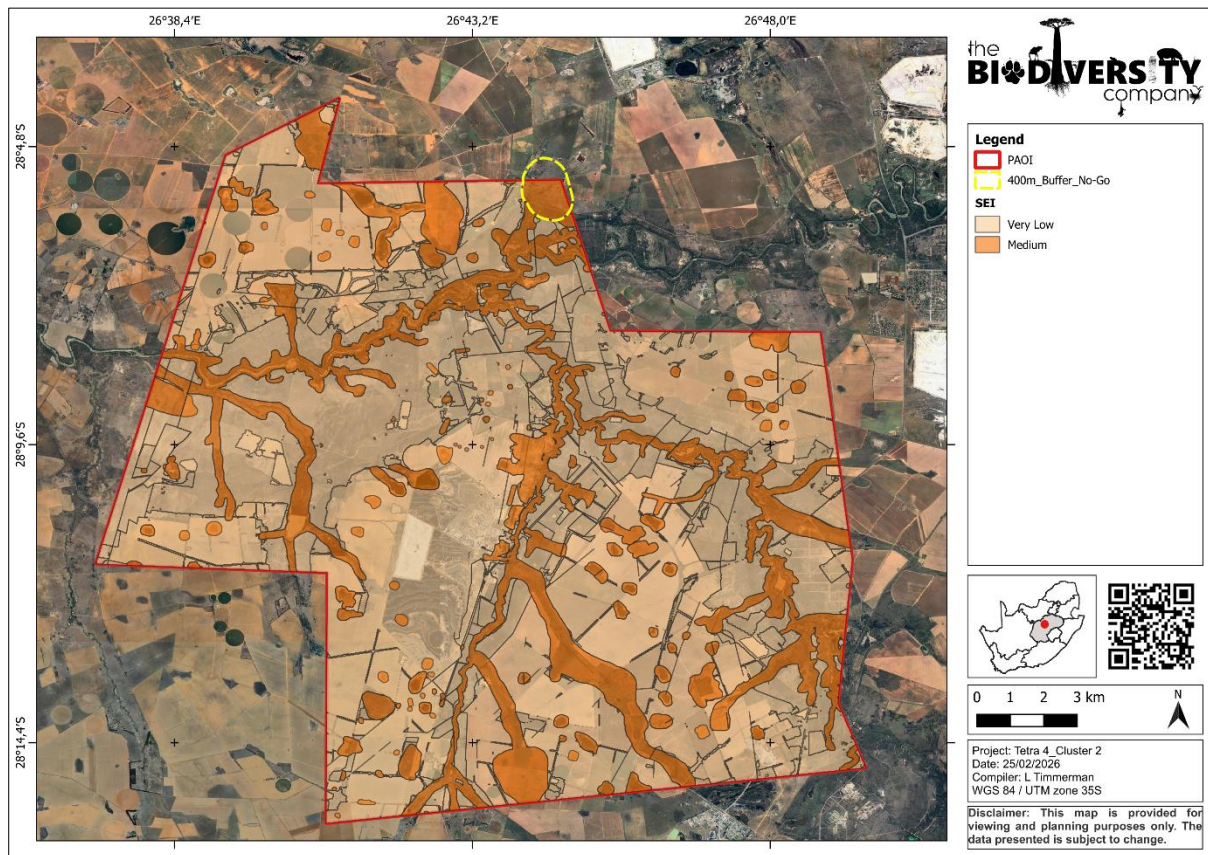


<p><b>Transformed</b></p> <p><u>Very Low</u> No confirmed and highly unlikely populations of SCC. No natural habitat remaining</p> <p><u>Very Low</u> No habitat connectivity except for flying species or flora with wind-dispersed seeds. Several major current negative ecological impacts.</p>	<p><b>Very Low</b></p>	<p><u>Very High</u> Habitat that can recover rapidly (~ less than 5 years) to restore &gt; 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.</p> <p><u>Very Low</u> Minimisation – mitigation – development activities of medium to high impact acceptable and restoration activities may not be required.</p>
<p><b>Water Resources</b></p> <p><u>High</u> Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of &gt; 10 km<sup>2</sup>. IUCN threatened species (CR, EN, VU) must be listed under any criterion other than A.</p> <p><u>Medium</u> 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</p>	<p><b>Medium</b></p>	<p><u>Very Low</u> 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.</p> <p><u>High</u> 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.</p> <p><u>Medium</u> Will recover slowly (~ more than 10 years) to restore &gt; 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</p> <p><u>Medium</u> Minimisation and restoration – mitigation – development activities of medium impact acceptable followed by appropriate restoration activities.</p>

<sup>5</sup> The increased resilience (Medium) is only relevant to the sensitivity of the receiving environment in relation to the avoidance of the Water Resources habitat unit. This assumes that mitigation measures are prescribed and adhered to for these components.



		disturbance or impact has been removed.	
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**Figure 3-5** Map depicting the Site Ecological Importance (SEI) sensitivity for the PAOI.

### 3.3.2 Screening Tool Comparison

The allocated sensitivities for each of the relevant themes are either disputed or validated in Table 3-7 below. 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 3-7 Summary of the screening tool vs specialist assigned sensitivities.**

Screening Tool Theme	Screening Tool	Habitat	Specialist	Tool Validated or Disputed by Specialist - Reasoning
Terrestrial Theme	Very High	Degraded Grassland No - Go	Medium	Disputed – Habitat disturbed due to historic and current anthropogenic activities and has therefore lost ecosystem functionality. It still serves as a corridor for flora and fauna dispersion. SS15 have been confirmed in the northern, small section of PAOI during the 2022 assessment.
		Degraded Grassland	Very Low	Disputed - Habitat exists in a degraded state, with reduced function. It still serves as a corridor for flora and fauna dispersion. CBA 1, 2 and ESA 1, 2 areas fall within the boundaries of this habitat type. Even though these areas are degraded, it is up to the relevant departmental authorities to decide whether these areas are classified as intact CBA.
		Disturbed Grassland	Very Low	Disputed – Habitat disturbed due to historic and current anthropogenic activities and has therefore lost ecosystem functionality. It still serves as a corridor for flora and fauna dispersion. CBA 1, 2 and ESA 1, 2 areas fall within the boundaries of this habitat type. Even though these areas are degraded, it is up to the relevant departmental authorities to decide whether these areas are classified as intact CBA.
		Transformed	Very Low	Disputed - Habitat exists in a transformed state with little to no function. Habitat will not recover without human intervention and will continue to degrade over time without rehabilitation.
		Water Resources	Medium	Disputed – Although some disturbances are present, these habitats provide ecosystem services to fauna and floral species.
Animal Theme	Medium	N/A	High	Disputed – Two (2) SCC were observed within the assessment area, moreover, some fauna SCC may potentially move through the area sporadically, but it is unlikely that they will remain within the area.
Plant Theme	Low	N/A	High	Disputed – One (1) SCC and seven (7) provincially protected flora were observed within the assessment area.

## 4 Impact Management and Mitigation Plan

The aim of the management outcomes is to present mitigation actions in such a way that they can be incorporated into the Environmental Management Programme (EMPr), and possible biodiversity management programme, for the project, which should in turn allow for a more successful implementation and auditing of the mitigations and monitoring guidelines. Table 4-1 presents the project specific, non-negotiable mitigation measures relative to the terrestrial assessment. Table 4-4 presents general mitigation measures.

The focus of mitigation measures is to reduce the significance of the likely impacts associated with the development, and thereby:

- Prevent the further loss and fragmentation of indigenous vegetation communities within the ecosystem within and around the PAOI;
- Reduce the negative fragmentation effects of the development and facilitate the safe movement of fauna species;
- Prevent the direct and indirect loss and disturbance of flora and fauna species and communities; and
- Adequately follow the guidelines for interpreting the SEI ratings assigned to the PAOI.

## 4.1 Project Specific Mitigation

### 4.1.1 Seismic Survey Activities

**Table 4-1** *Summary of management objectives pertaining to impacts and vegetation during the seismic survey activities*

<b>Anticipated Impact</b>	<b>Destruction, further loss and fragmentation of the of habitats, ecosystems and vegetation community</b>
<b>Mitigation Objective</b>	<b>Avoidance / minimisation of the disturbance and degradation of vegetation and ecosystems</b>
<b>Mitigation: Action/control</b>	
<ul style="list-style-type: none"> <li>• Medium SEI areas (viz. Degraded Grassland Sensitive Species and Water Resources) are to be avoided. These should be declared No-Go areas. <ul style="list-style-type: none"> <li>○ A 400m buffer should be applied to the Degraded Grassland Sensitive Species habitat, and</li> <li>○ Riparian vegetation should be avoided, as these vegetation types play an important role in protecting watercourses and water quality. These zones provide habitat, food and corridors for the movement of fauna.</li> </ul> </li> <li>• Indigenous vegetation to be maintained (no clearing for seismic lines) to ensure biodiversity is maintained and to prevent soil erosion.</li> <li>• Restrict all Seismic survey activities to authorised footprint areas only.</li> <li>• If required, vegetation clearing commences only after the necessary permits for SCCs or protected plants have been obtained. Any individual of the protected plants that were observed needs a relocation or destruction permit for any individual to be removed or destroyed due to the development. High visibility flags must be placed near any protected plants to avoid any damage or destruction of the species. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness programme.</li> <li>• Make the maximum use of existing roads, tracks and old seismic lines.</li> <li>• A nest walkdown must be performed prior to the Seismic survey of the PAOI. If nests are found, necessary permits and appropriate relocation (if feasible) mitigations should be followed under the consultation with a qualified specialist.</li> <li>• Avoidance Mitigation <ul style="list-style-type: none"> <li>○ Micro-siting: changing the layout of PAOI to avoid Medium sensitive areas (viz. Degraded Grassland Sensitive Species and Water Resources).</li> </ul> </li> <li>• Roads and road edges should be designed to facilitate faunal movement. These movement corridors must be in the designated areas, and well sign-posted with speed controls enforced.</li> <li>• No Seismic survey will be undertaken during or shortly after a significant rainfall event. <ul style="list-style-type: none"> <li>○ The use of machinery on wet soils causes compaction and rutting, ultimately leading to an increased possibility of initiating erosion or destroying soil structure.</li> <li>○ Hence, all work will be suspended until the work area has sufficiently dried out.</li> </ul> </li> </ul>	

**Table 4-2** *Summary of management objectives pertaining to impacts caused by alien and invasive vegetation during the seismic survey activities*

<b>Anticipated Impact</b>	<b>Spread of alien and/or invasive species</b>
<b>Activity/risk source</b>	<b>Cleared Areas, lay-down areas, fire and dust.</b>
<b>Mitigation Objective</b>	<b>Avoidance / minimisation of the disturbance and degradation of vegetation and ecosystems</b>
<b>Mitigation: Action/control</b>	
<ul style="list-style-type: none"> <li>No clearance or removal of Alien Invasive Plants (AIP) is permitted without an approved AIP Management Plan in place.</li> </ul>	

**Table 4-3** *Summary of management objectives pertaining to fauna during the seismic survey activities*

<b>Anticipated Impact</b>	<b>Displacement of faunal community due to habitat loss, direct mortalities and disturbance (road collisions, noise, dust, vibration and poaching)</b>
<b>Activity/risk source</b>	<b>Land clearing, and human presence as well as roads.</b>
<b>Mitigation Objective</b>	<b>Avoidance / minimisation of the disturbance and mortality of fauna</b>
<b>Mitigation: Action/control</b>	
<ul style="list-style-type: none"> <li>Prior to Seismic survey activities, the area should be walked on foot by 1-2 individuals to create a disturbance in order for fauna to move off. Disturbance must occur as soon before Seismic survey activities as possible and no unnecessary disturbance to the area is permitted <ul style="list-style-type: none"> <li>Any tortoises present should be removed from the affected areas before the start of Seismic survey activities and relocated them to safe areas within the PAOI.</li> <li>Any fauna threatened by the Seismic survey activities should be removed safely by an appropriately qualified environmental officer or removal specialist.</li> </ul> </li> <li>To reduce any impact on the possible presence of significant burrowing mammal species, line clearance crews will be instructed at induction on the detection of these species scats and signs. <ul style="list-style-type: none"> <li>If these species are detected, then no ground disturbance will take place within 100 m of these areas.</li> <li>Indications of the presence of these species need to be reported.</li> </ul> </li> <li>Safely relocate any wildlife at risk from Seismic survey activities with the help of a qualified environmental officer or specialist.</li> <li>Limit Seismic crew vehicle speeds to 40 km/h to prevent accidents, and install appropriate speed control measures and signage. <ul style="list-style-type: none"> <li>Driving on access roads at night should be restricted to maximum 20 km/h to reduce or prevent wildlife road mortalities which occur more frequently during this period.</li> </ul> </li> <li>Focus work on one area at a time to reduce the extent of on-site activities, allowing wildlife to relocate as the project progresses. This helps smaller animals find refuge in nearby undisturbed areas.</li> <li>No nighttime Seismic survey activities to minimise disturbances to nocturnal species expected in the area.</li> <li>All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region;</li> <li>The No-Go 400m buffer area for Degraded Grassland Sensitive Species must be avoided for Seismic survey activities.</li> <li>Provide all personnel and contractors to undergo Environmental Awareness Training to all personnel and contractors. A signed register of attendance must be kept for proof. Discussions The training must include. <ul style="list-style-type: none"> <li>All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.</li> </ul> </li> <li>As far as possible cables on cable laying trucks should be insulated</li> <li>Where possible, instead of surveying the entire area at once, work on specific sections as needed. This approach involves focusing on one area at a time and following a systematic process. By doing so, the amount and scope of on-site activities are minimized, which allows wildlife to gradually relocate as the project advances. This method provides smaller birds, mammals, and reptiles the opportunity to cope with the disturbance by staying in nearby undisturbed areas that are close to their natural habitats.</li> <li>A nest walkdown must be performed prior to Seismic survey activities, by a suitably qualified person. If nests are found a suitably qualified specialist must be contacted to advise on the way forward.</li> <li>Keep noise levels low from dusk to dawn to avoid disturbing amphibians and nocturnal mammals.</li> </ul>	

#### 4.1.2 Post -Survey Inspection Phase

A post-survey inspection will be conducted to determine whether active rehabilitation is required. Where necessary, site rehabilitation should commence as soon as possible following the completion of data acquisition, subject to prevailing weather conditions. If rehabilitation cannot be completed due to the onset of the wet season, all outstanding activities will be carried out during the following dry season.

Compacted or rutted soils may be lightly scarified using a three-cut snake pattern to decompress soils, improve aeration, and prevent channelling of surface water flows.

Upon completion of the seismic survey, all equipment and waste will be removed from operational areas. All permanent markers, steel pegs, and other materials will also be removed from seismic lines and operational areas, except for permanent markers required under legislation.

#### 4.2 General mitigation

**Table 4-4**      ***General mitigation measures for the project.***

Mitigation: Action/control
<ul style="list-style-type: none"> <li>• Demarcate work areas during the seismic survey activities to avoid affecting outside areas. Use physical barriers e.g., safety tape, not painted lines, and use signage.</li> <li>• All activities must make use of existing roads and tracks as far as practically and feasibly possible. No new roads or servitudes should be constructed where existing infrastructure can be used.</li> <li>• Do not clear areas of indigenous vegetation outside of the direct project footprint.</li> <li>• No vegetation clearing permitted.</li> <li>• Prohibit staff from bringing any plant species into or out of the PAOI. This includes both indigenous and exotic plants to prevent the spread of invasive species and illegal plant collection.</li> <li>• Dust-reducing mitigation measures must be put in place and must be strictly adhered to, for all roads and bare (unvegetated) areas.             <ul style="list-style-type: none"> <li>○ No non-environmentally friendly suppressants may be used as this could result in pollution of water sources.</li> </ul> </li> <li>• Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.</li> <li>• A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.             <ul style="list-style-type: none"> <li>○ Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.</li> <li>○ No servicing of equipment on site unless necessary.</li> <li>○ All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers.</li> <li>○ Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment.</li> <li>○ Construction activities and vehicles could cause spillages of lubricants, fuels and waste material negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the PAOI.</li> </ul> </li> </ul>

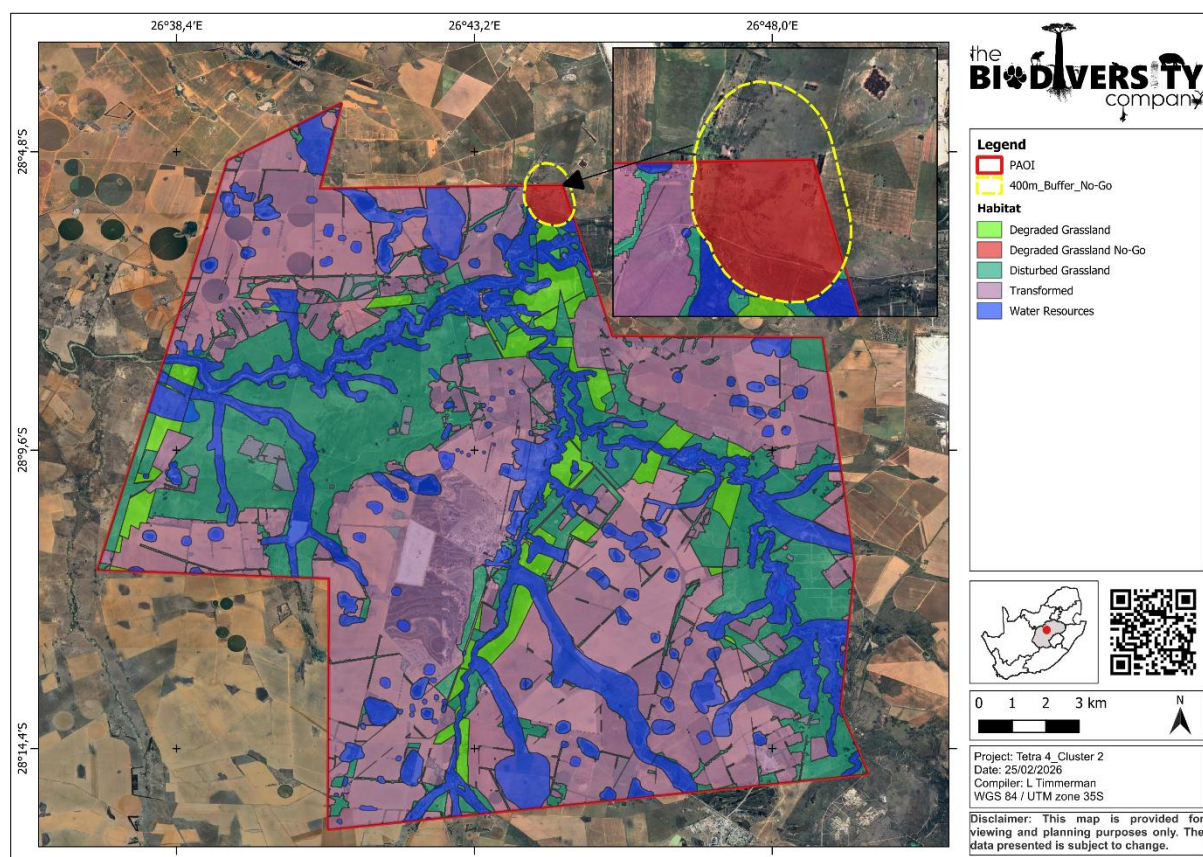


### 4.3 Biodiversity Risk Assessment

#### 4.3.1 Impact Assessment Considerations and Procedure

The project activities will have a negative effect on the natural environment of the area. Anthropogenic activities drive habitat destruction leading to the displacement of fauna and flora and possibly causing direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, foraging and nesting sites, and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation is likely to reduce the habitat available for all types of fauna species and hence reduce animal populations and species compositions within the area.

The additional impacts associated with the proposed activities, which weren't considered covered in the existing approved Cluster 1 EIA and EMP, are considered in this section. (Figure 4-1).



**Figure 4-1 Illustration of the No – Go for SS15 within the PAOI**

The species environmental guidelines SANBI (2020) indicate that specific directives contained within a Biodiversity Management Plan (BMP) must take precedence as mitigation measures. According to the guidelines, SANBI (2020), there is a BMP currently in development for the IUCN VU Sensitive Species 15 that specifically states that: 'Destruction of intact habitat with extant to Sensitive Species 15 populations is not permitted'. Therefore, avoidance mitigation and not minimisation mitigation would be applicable in such a case. Additionally, the protocols advise a minimum buffer of 250 meters, to up to 400 m buffer to be applied around the periphery of SS15 colonies, which in this case represent the Medium sensitivity area. There are no mitigation measures that can be described in this report that will reduce the significance of the risk to an acceptable level, and hence no impact significance rating will be conducted. The Seismic survey activities within these Medium Sensitivity areas is considered 'No-Go'. In order to guide the development, mitigations regarding the species can be seen in Table 4-5 below

**Table 4-5 Mitigations for Sensitive species**

Activities	Impact/ Aspect	Management/ Mitigation Measures
All	Management of sensitive area.	Medium sensitivity area to be avoided and declared a No - Go area. A 400m buffer have been added to the No - Go area, to assist with the avoidance. If possible, all livestock (including cattle, pigs, goats, domestic dogs and cats) must be kept out of the area at all times.
All	Loss / destruction of natural habitat	The areas to be surveyed must be specifically demarcated to prevent movement into surrounding environments, especially grassland surrounding the Medium Sensitivity area. Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be avoided.
All	Fauna direct and indirect mortality. Possibility of poaching incidents	<b>Any and all information within this report and additional reports pertaining to the locality of the species, must not be divulged or made available to the public.</b> Due to the sensitivity of this species, especially in regard to its illegal collection, <b>no locality data should be displayed or provided to the public.</b> Any person during the application process should treat the information with the necessary confidentiality. Any SS15 mortalities should be cross checked to confirm the identification. Traffic and car movement will cause disturbance to SS15.
All	Environmental Awareness	All personnel should undergo environmental awareness and induction training regarding the species and their sensitivity. Stakeholder engagement with landowners must be conducted to assist in the presence/absence of the species.
All, Especially Planning Phase	Management of fauna	Consultation and communication with the lead or implementing agent for the species, Endangered Wildlife Trust (EWT), must be implemented before any construction within or close to the specific area. Monitoring and Management of the species will be crucial throughout the lifetime of the project and must be discussed and implemented by the EWT.

#### 4.4 Cumulative Impacts

The quantitative impact of the proposed project in isolation on terrestrial biodiversity is anticipated to be “low” due to the expected adherence to mitigation. The cumulative impact of the proposed project on habitats, plants and animals is anticipated to be “low”. The project area has undergone historic and current disturbance, like the disturbances that the local area has undergone.

After implementation of the mitigation measures as stipulated above the integrity and functionality of the natural habitat is not expected to deteriorate further as a result of the proposed development and no irreplaceable loss of terrestrial biodiversity is anticipated.

**Table 4-6 Cumulative Impacts associated with the proposed project**

Nature of the Impact	Status	Impact Rating	Can impact be mitigated?	Is the impact acceptable?	Proposed Mitigation Measures
Vegetation clearance as part of the construction phase activities.	Impact in isolation	Negative Low	Yes	Yes	Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.
	Cumulative impact	Negative Low			An Alien Invasive Plant (AIP) Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changes in AIP composition.



## 5 Conclusion

The habitats within the PAOI for the proposed Tetra 4 Cluster 2 Project have been significantly altered by historical and ongoing land use, including agriculture, infrastructure development, mining, overgrazing, and widespread infestation by AIP species. As a result, most areas within the PAOI are in a degraded or modified state, reduced potential for supporting SCC. The remaining natural habitats are fragmented and subject to edge effects from roads, borrow pits, and other anthropogenic activities.

According to the Free State Biodiversity Plan (2015), the PAOI overlaps with areas classified as Critical Biodiversity Areas (CBA) 1 [Irreplaceable], CBA 2, Ecological Support Areas (ESA) 1 and ESA 2 (Figure 5-1). While much of the PAOI is dominated by transformed [viz. agricultural activities and mining] and stands of AIPs and is therefore no longer broadly representative of the EN Vaal-Vet Sandy Grassland ecosystem, however some sections within the Disturbed Grassland and Degraded Grassland habitat units do retain characteristics representative of the bioregion. Importantly, the nature of the impacts associated with the proposed activities is expected to be temporary and not destructive. Given the already degraded and fragmented state of the habitats within the PAOI, and the limited potential for supporting SCC, the proposed activities are unlikely to result in significant additional loss of biodiversity or irreversible ecological damage. **Despite this, consultation with regulating authorities is recommended for any development within CBAs and threatened ecosystems.**

The completion of this Terrestrial Biodiversity assessment led to a dispute of the 'Very High' Terrestrial Biodiversity Theme Sensitivity as set out in the National Environmental Screening Tool. The PAOI is assigned predominantly 'Medium' [viz. Degraded grassland Sensitive Species and Water Resources] and 'Very Low' [viz. Degraded Grassland, Disturbed Grassland and Transformed] Terrestrial Theme Sensitivity. The Animal Species Theme Sensitivity has been disputed as high due to the presence of two SCC confirmed within the assessment area. The sensitivity for Plant Species Theme has been disputed as high, due to the presence of one SCC and seven protected flora species within the assessment area.

### 5.1 Impact Statement

No fatal flaws were identified for the project. The overall residual impact of the project is expected to be low **with mitigations applied**. Considering the above-mentioned information, it is the opinion of the specialists that the proposed project is favourable only if all mitigation measures provided in this and other specialist reports are implemented, and the below recommendations are achieved. The Competent Authority must consider all mitigation measures provided in this report, as well as those listed in any accompanying specialist reports.

The Compliance Statement provided in this report is strictly contingent upon the complete avoidance of all areas classified as Medium Sensitivity Ecological Importance [viz. Degraded grassland Sensitive Species and Water Resources] within the Cluster 2 PAOI. This statement is based solely on areas designated as Very Low SEI, specifically Degraded Grassland, Disturbed Grassland, and Transformed habitats.

It is important to note that the Animal Species Theme Sensitivity for the assessment area will be classified as Low, provided that all Medium SEI areas are avoided. This determination is based on the following considerations:

- The presence of a reptile Species of Conservation Concern is limited to a small section of Degraded Grassland;
- The presence of a mammal Species of Conservation Concern is confined within Water Resources;

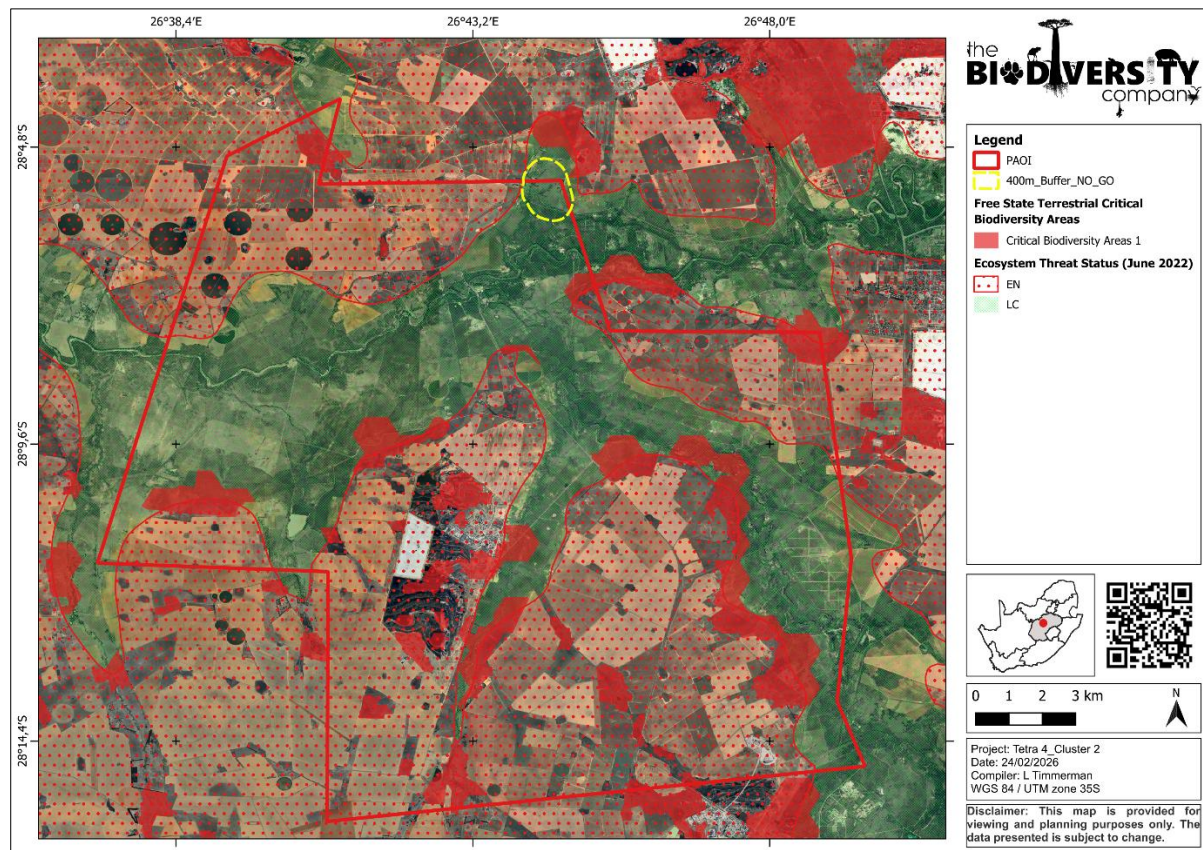
- If these sensitive areas are fully avoided, the Animal Species Theme Sensitivity will be Low,; and
- If all flora Species of Conservation Concern and provincially protected flora species are avoided, the Plant Species Theme Sensitivity will be considered Low.

## 5.2 Specialist Opinion and Layout Approval

It is the opinion of the specialist that the proposed Tetra4 Cluster 2 Project is favourable for authorisation, subject to the following conditions:

1. All mitigation and management measures outlined in this and other specialist reports must be strictly implemented;
2. Complete avoidance of all areas classified as Medium Sensitivity Ecological Importance within the Cluster 2 PAOI; and
3. An updated layout of the PAOI must be delineated to clearly demonstrate the avoidance of Medium SEI habitats.

Free Biodiversity Spatial Plan	State	Habitat unit	Condition	SEI	Specialist Opinion	Impact Statement
CBA1 & 2		Degraded Grassland	Degraded	Very Low	Drivable	Acceptable impacts
		Degraded Grassland (Sensitive Species)	Degraded	Medium	No-Go	Acceptable impacts
		Disturbed Grassland	Disturbed	Very Low	Drivable	Acceptable impacts
		Transformed	Modified	Very Low	Drivable	Acceptable impacts
		Water Resources and Buffers	Disturbed	Medium	Refer to accompanying Freshwater Assessment (TBC, 2026)	Refer to accompanying Freshwater Assessment (TBC, 2026)



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

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## 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:
  - Ecosystem Threat Status – 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), Near Threatened (NT) or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. 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, 2024a) – 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.
- The Free State Terrestrial CBA Plan (2015): 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 as a whole. 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;
- Key Biodiversity Areas (KBAs) (SANBI, 2024) – KBAs are identified using the Global Standard for the Identification of KBAs, developed by the International Union for the Conservation of Nature (IUCN). The standard involves applying five criteria to gauge an area's importance for biodiversity. These criteria consider the presence of threatened species or ecosystems, species with limited global distributions, pristine wilderness, significant biological processes, or irreplaceable biodiversity. Each criterion has specific quantitative thresholds to determine if they are met. As of 2023, over 16,000 KBAs have been identified globally, covering more than 20 million square kilometres. South Africa completed its first comprehensive national assessment in 2023, evaluating over 9,900 species or ecosystem types and identifying 260+ individual KBAs; 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.



## 7.2 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 Project Area) 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
<b>Very High</b>	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 <sup>2</sup> . 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).
<b>High</b>	Confirmed or highly likely occurrence of CR, EN, VU species that have a global EOO of > 10 km <sup>2</sup> . 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).
<b>Medium</b>	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.
<b>Low</b>	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.
<b>Very Low</b>	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
<b>Very High</b>	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.
<b>High</b>	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.
<b>Medium</b>	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.

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	Mostly minor current negative ecological impacts, with some major impacts and a few signs of minor past disturbance. Moderate rehabilitation potential.
<b>Low</b>	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.
<b>Very Low</b>	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
<b>Very High</b>	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.
<b>High</b>	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.
<b>Medium</b>	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.
<b>Low</b>	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.
<b>Very Low</b>	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 – Specialist Declaration of Independence

I, Lize Timmerman, 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.



Lize Timmerman

Terrestrial Ecologist

The Biodiversity Company

February 2026



I, Dr Candyce Areington, 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.



Dr Candyce Areington

Terrestrial Ecologist

The Biodiversity Company

February 2026

I, Martinus 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.



Martinus Erasmus

Terrestrial Ecologist


The Biodiversity Company

February 2026

## 7.4 Appendix D – Specialist CVs

# Lize Timmerman

Cand Sci Nat 158700    +27 72 529 7454    lize@thebiodiversitycompany.com



### PROFILE SUMMARY

Environmental scientist and Candidate Natural Scientist (SACNASP 158700) with over 3 years' specialist consulting experience across all South African provinces. Expertise includes conducting ecological assessments, flora and fauna surveys, rehabilitation and monitoring plans, search and rescue operations, and farm management plans. Experienced in delivering high-quality field surveys and technical reporting aligned with South African legislation. Passionate about working with nature to preserve it's beauty through scientifically sound conservation and restoration practices.

### PERSONAL INFO

Nationality: South African  
Date of birth: 22 September 1995

### EXPERIENCE


Environmental Impact Assessments (EIA)  
Environmental Management Programmes (EMP)  
Project Management  
Logistics

### SKILLS

- ✓ Biodiversity & Terrestrial Ecological Assessments
- ✓ Ecology
- ✓ Rehabilitation
- ✓ Monitoring & Management Plans

### LANGUAGES

English – Proficient  
Afrikaans – Proficient



Signed: Lize Timmerman

### ACADEMIC QUALIFICATIONS

**University of Pretoria (2024 – current): MASTER OF SCIENCE (MSc) – Wildlife Health, Ecology and Management.**

**University of the Free State (2019): BACHELOR OF SCIENCE (BSc) - Agriculture majoring in Grassland Science and Wildlife Production.**


**GAME WAYS (2018) - Game Ranch Management Certificate.**

### PROFESSIONAL EXPERIENCE

April 2025 – Present	<b>The Biodiversity Company</b> Terrestrial Ecology
Jan 2023 – Aug 2023	<b>Department of Agriculture, Land Reform and Rural Development</b> Agricultural Assistant Practitioner
Jan 2019 – Dec 2024	<b>Eco – Wild Trust and FarmPlanner</b> Part-time Terrestrial Ecologist
Jan 2019 – Dec 2021	<b>University of the Free State</b> Research Assistant

### COUNTRY EXPERIENCE

South Africa.



# Dr Candyce Ann Areington

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candyce@thebiodiversitycompany.com



## PROFILE SUMMARY

Environmental Terrestrial ecologist with over three years of botanical and consulting experience, with international working experience. Specialist expertise in habitat delineation, ecological assessments, biodiversity offsets, rehabilitation and monitoring plans, across renewable energy, mining, and private development sector. Skilled in providing specialist guidance, technical support, and facilitation to ensure compliance with in-country legislative requirements. 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: 09 December 1991

## EXPERIENCE

Rehabilitation Plans Development and Implementation

Biodiversity Management Plans

Monitoring programmes

Terrestrial Biodiversity Assessments

Field work and research

## SKILLS

- ✓ Ecology
- ✓ Environmental Control Officer (ECO)
- ✓ Environmental Rehabilitation
- ✓ Monitoring & Management Plans
- ✓ Plant evaluations from molecular to ecological

## LANGUAGES

English – Proficient

Afrikaans – Conversational

Signed: Dr Candyce Areington

## ACADEMIC QUALIFICATIONS

PhD Biological Sciences, University of KwaZulu-Natal, South Africa (SA).

MSc Biological Sciences (*Cum laude*), University of KwaZulu-Natal, SA.BSc (Hons) Biological Sciences (*Cum laude*), University of KwaZulu-Natal, SA.

BSc Environmental Science, University of KwaZulu-Natal, SA.

## PROFESSIONAL EXPERIENCE

October 2023 – Present	<b>The Biodiversity Company</b> Terrestrial Ecologist
July 2022 – December 2023	<b>Green Scene-Environmental</b> Environmental and Conversation Officer
July 2016 – November 2020	<b>University of KwaZulu-Natal</b> AD-HOC Lecturer
June 2018 – March 2020	<b>Plant Germplasm Conservation Research unit</b> Senior Administrator
January 2013 – December 2013	<b>University of KwaZulu-Natal</b> Research Assistant

## INTERNATIONAL EXPERIENCE

Botswana, South Africa





# Martinus ERASMUS



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## 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

Signed: Martinus Erasmus

## 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

