



SOILS, AGRICULTURE, FRESHWATER AND TERRESTRIAL BIODIVERSITY SCREENING REPORT

Motuoane Energy (Pty) Ltd Gas Exploration Project

Matjhabeng and Moqhaka Local Municipality Local Municipalities, Welkom, Free State Province, South Africa

February 2025
Updated April 2025

CLIENT



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1 Introduction

1.1 Background

The Biodiversity Company was appointed to undertake a screening assessment for the proposed Motuoane Energy (Pty) Ltd Gas Exploration Project. The proposed project involves core exploration drilling and seismic survey activities, as well as all associated infrastructure. The project is located, near the town of Welkom, Matjhabeng and Moqhaka Local Municipality and the Lejweleputswa and Fezile Dabi District Municipalities, Free State Province. The regional context of the Project Area of Influence (PAOI) can be seen in Figure 1-1. The proposed PAOI can be seen illustrated in Figure 1-2 and Figure 1-3, showing the potential placement of drilling holes as well as seismic lines.

This assessment was conducted in accordance with the amendments to the Environmental Impact Assessment Regulations. 2014 (2024 NEMA as amended) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The approach has taken cognisance of the recently published Government Notices (GN) 320 (20 March 2020) and GN 1150 (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" (Reporting Criteria). The National Web based Environmental Screening Tool has characterised the theme sensitivity of the PAOI as following:

- Terrestrial Biodiversity Theme sensitivity is Very High for the PAOI, due to the area overlapping with CBA 1, CBA 2, ESA 1, ESA 2, NPAES, an Endangered Vegetation type, two protected areas and a FEPA Sub catchment area (Figure 5-1);
- Plant Species Theme sensitivity is Low for the PAOI, with no sensitive species predicted to occurring within the PAOI (Figure 5-2);
- Animal Species Theme sensitivity is High for the PAOI, with the possibility of one (1) medium to high sensitivity reptile species, two (2) high sensitivity avifauna species, one (1) medium-high sensitivity avifauna species and one (1) medium sensitivity mammal species being present (Figure 5-3);
- Aquatic Biodiversity Theme sensitivity is Very High for the PAOI due to five (5) wetlands, three (3) rivers and one (1) FEPA Sub catchment area occurring within the PAOI (Figure 5-4); and
- Agriculture Potential Theme sensitivity is Very High for the PAOI, with the land capability ranging from Low-Moderate (06) to High-Very High (10) (Figure 5-5).

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

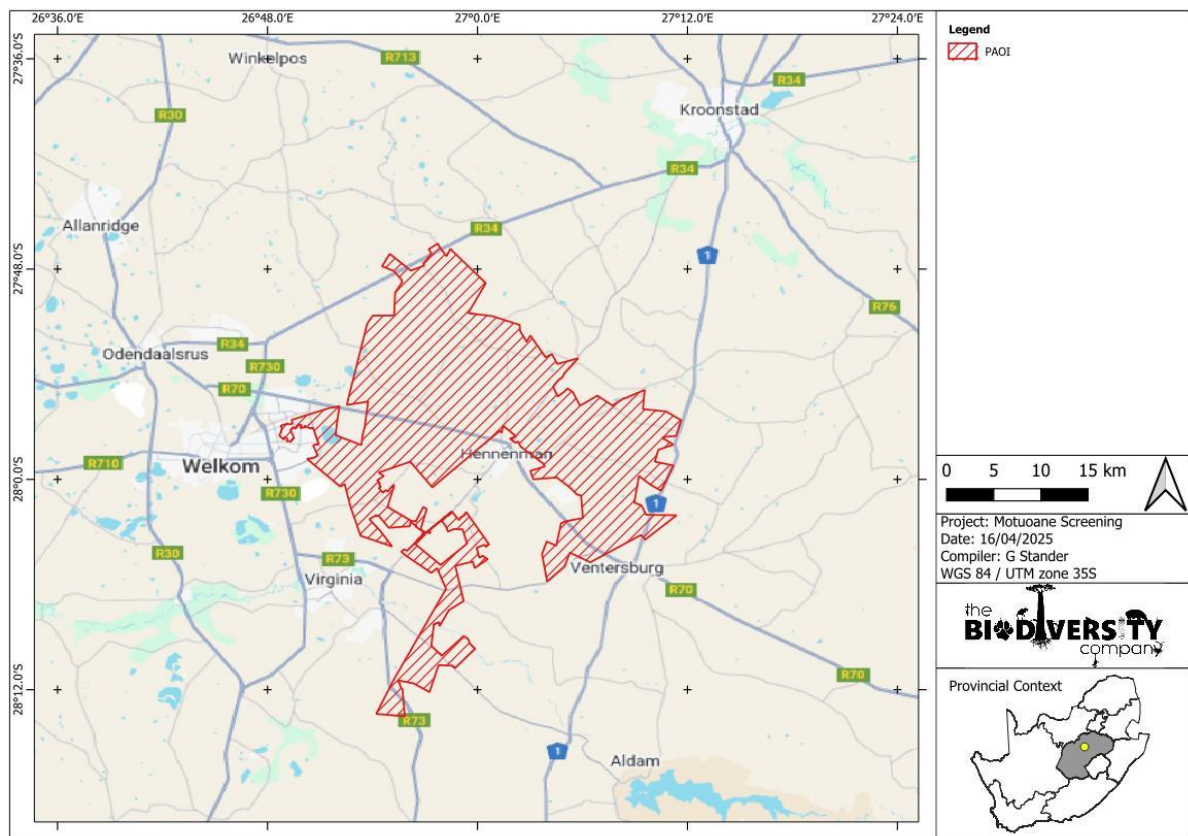


Figure 1-1 *The location of the PAOI in relation to the nearby towns.*

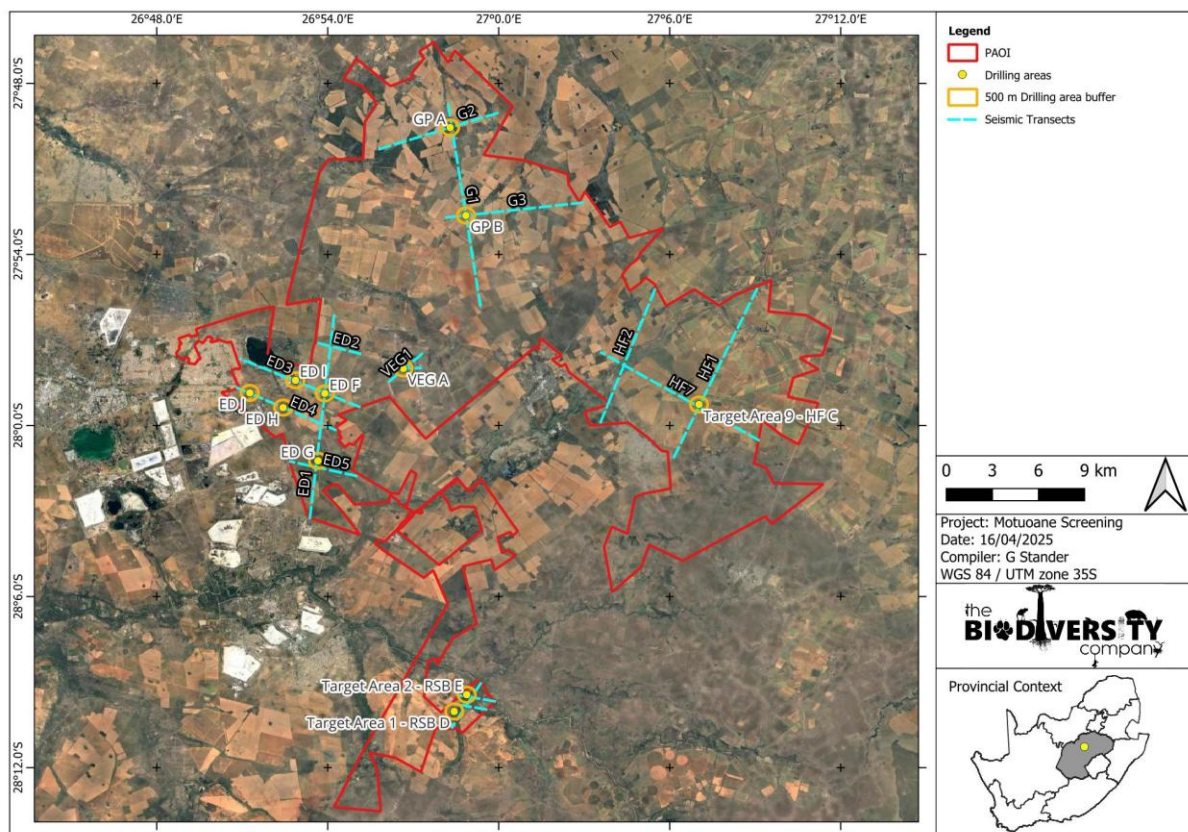


Figure 1-2 **Layout of the PAOI.**

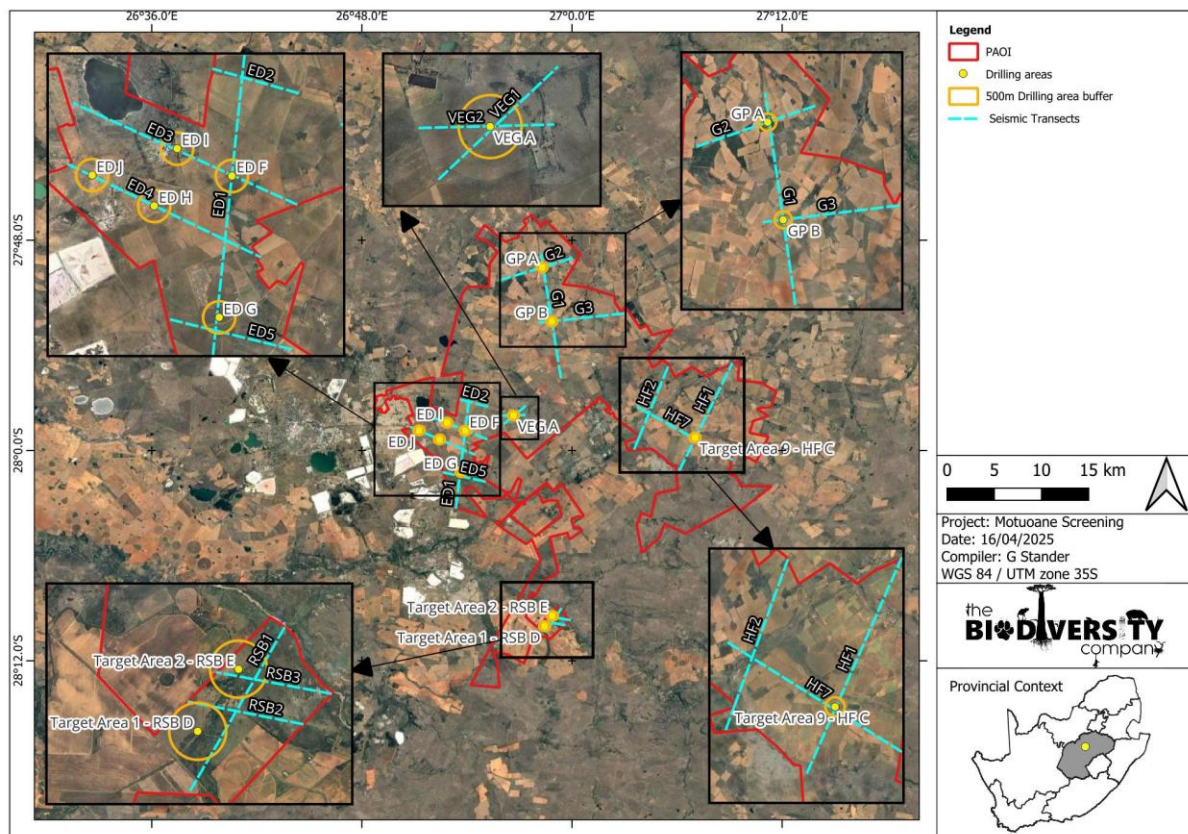






Figure 1-3 Detailed layout of PAOI.

1.2 Specialist Details

Report Name	SOILS, AGRICULTURE, FRESHWATER AND TERRESTRIAL BIODIVERSITY SCREENING REPORT	
Reference	Motuoane Energy (Pty) Ltd Gas Exploration Project	
Submitted to		
Report Writer	Julia Elliott (Cand. Nat. Sci. 169961)	
Reviewer	Grietjie Stander (Cert. Nat. Sci. 162039)	
Reviewer	Carami Birger (Pri. Sci. Nat. 121757)	
Declaration	<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>	

1.3 Scope of Work

- The principle aim of the assessment was to provide information to assess/understand/evaluate the risk of the proposed activity to the ecological communities of the associated ecosystems and the agricultural potential within the PAOI. This was achieved through the following:
- Desktop assessment to identify the relevant ecologically important geographical features within the PAOI;
- Desktop assessment to compile an expected species lists (fauna and flora) and identify possible threatened flora and fauna species that occur within the PAOI;
- Desktop assessment to identify the relevant ecologically important hydrological features within the PAOI;
- Identify the manner that the proposed project impacts based on the screening assessment information and the desktop information, and evaluate the level of risk of these potential impacts; and
- The prescription of mitigation measures and recommendations for identified risks.

2 Key Legislative Requirements

The legislation listed below in Table 2-1 are applicable to the current project. The list below, although extensive, may not be complete and other legislation, policies and guidelines may apply in addition to those listed below.

Table 2-1 *A list of key legislative requirements relevant to biodiversity and conservation in the Free State*

Region	Legislation
International	Convention on Biological Diversity (CBD, 1993)
	The Convention on Wetlands (RAMSAR Convention, 1971)
	The United Nations Framework Convention on Climate Change (UNFCCC, 1994)
	The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 1973)
	The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention, 1979)
National	Constitution of the Republic of South Africa (Act No. 108 of 2006)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998)
	The National Environmental Management Protected Areas Act (Act No. 57 of 2003)
	The National Environmental Management Biodiversity Act (Act No. 10 of 2004)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 42946 (January 2020)
	The National Environmental Management Act (NEMA) (Act No. 107 of 1998) Section 24 , No 43110 (March 2020)
	The National Environmental Management: Waste Act, 2008 (Act 59 of 2008);
	The Environment Conservation Act (Act No. 73 of 1989) and associated EIA Regulations
	National Protected Areas Expansion Strategy (NPAES)
	Environmental Conservation Act (Act No. 73 of 1983)
	Natural Scientific Professions Act (Act No. 27 of 2003)
	National Biodiversity Framework (NBF, 2009)
	National Forest Act (Act No. 84 of 1998)

	National Veld and Forest Fire Act (101 of 1998)
	National Spatial Biodiversity Assessment (NSBA)
	World Heritage Convention Act (Act No. 49 of 1999)
	National Heritage Resources Act, 1999 (Act 25 of 1999)
	Municipal Systems Act (Act No. 32 of 2000)
	Alien and Invasive Species Regulations, 2014
	South Africa's National Biodiversity Strategy and Action Plan (NBSAP)
	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
	Sustainable Utilisation of Agricultural Resources (Draft Legislation).
	White Paper on Biodiversity
	Boputhatswana Nature Conservation Act 3 of 1973
Provincial	Free State Nature Conservation Ordinance 8 of 1969
	Free State Province Biodiversity Plan V1.0 of 2015

3 Methods

3.1 Desktop Assessment

The desktop assessment was principally undertaken using a Geographic Information System (GIS) to access the latest available spatial datasets to develop digital cartographs and species lists. These datasets and their date of publishing are provided below.

3.1.1 Ecologically Important Landscape Features

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

National Biodiversity Assessment 2018 (Skowno *et al*, 2019) (NBA) - The purpose of the 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. The revised list [known as the **Red List of Ecosystems (RLE 2022)**] 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 (Mucina and Rutherford 2006; with updates described in Dayaram *et al.*, 2019). The revised list identifies 120 threatened terrestrial ecosystem types (55 Critically Endangered, 51 Endangered and 14 Vulnerable types). The revised list was published in the Government Gazette (Gazette Number 47526, Notice Number 2747) and came into effect on 18 November 2022 (Skowno & Monyeke, 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. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems.

- Protected areas - South Africa Protected Areas Database (SAPAD) (DEA, 2023) – The SAPAD Database contains spatial data pertinent to the conservation of South African biodiversity. It includes spatial and attribute information for both formally protected areas and areas that have less formal protection. SAPAD 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) (SANBI, 2018) – The NPAES provides spatial information on areas that are suitable for terrestrial ecosystem protection. These focus areas are large, intact and unfragmented and therefore, of high importance for biodiversity, climate resilience and freshwater protection.
- Conservation/Biodiversity Sector Plans:
 - The Free State Province Biodiversity Plan classifies areas within the province on the basis of their contributions to reaching the associated conservation targets within the province. These areas are primarily classified as either Critical Biodiversity Areas (CBAs) or 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.
 - CBAs are areas of the landscape that need to be maintained in a natural or near-natural state to ensure the continued existence and healthy functioning of important species and ecosystems and the delivery of ecosystem services. Thus, if these areas are not maintained in a natural or near natural state then provincial biodiversity targets cannot be met (SANBI, 2017).
 - ESAs are areas that are not essential for meeting biodiversity representation targets but play an important role in supporting the ecological functioning of ecosystems as well as adjacent Critical Biodiversity Areas, and/or in delivering ecosystem services that support socio-economic development (SANBI, 2017).
 - Provincial CBAs and ESAs are often further classified into sub-categories, such as CBA1 and CBA2 or ESA1 and ESA2. These present fine scale habitat and biodiversity area baseline requirements and associated land management objectives or outcomes. The highest categorisation level is often referred to as an 'Irreplaceable Critical Biodiversity Area' which usually represents pristine natural habitat that is very important for conservation.

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.

Freshwater Ecology:

South African Inventory of Inland Aquatic Ecosystems (SAIIAE) (Van Deventer *et al.*, 2018) – A SAIIAE was established during the NBA of 2018. It is a collection of data layers that represent the extent of river and inland wetland ecosystem types and 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.

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.

3.1.2 Desktop Flora Assessment

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

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

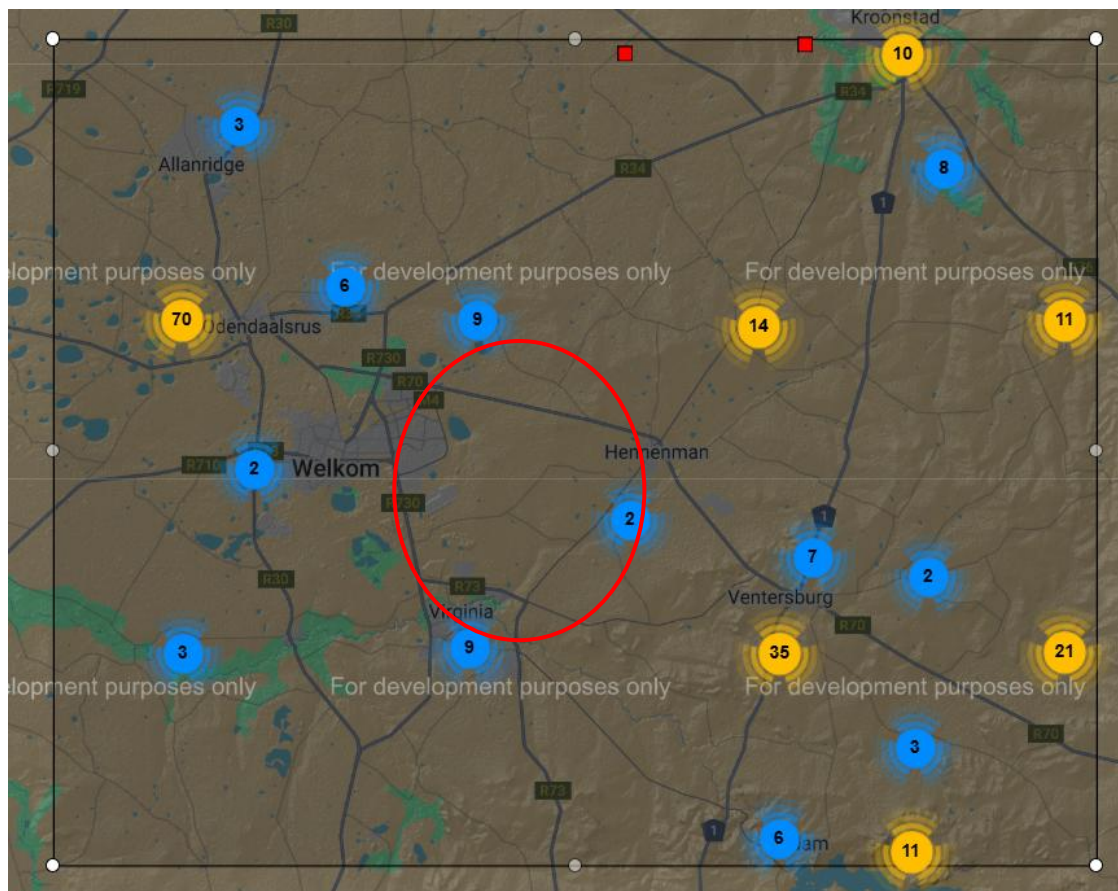


Figure 3-1 Map illustrating extent of area used to obtain the expected flora species list from the POSA database. Red oval indicates the approximate location of the PAOI.

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

Provincially Protected Plant Species (Schedule 6 of the Free State Nature Conservation Ordinance No. 8 of 1969);

Nationally Protected plant species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004); and

List of Nationally Protected Tree Species (DFFE, 2022).

3.1.3 Desktop Faunal Assessment

The faunal desktop assessment comprised of the following, compiling an expected:

- Amphibian list, generated from the iNaturalist Database;
- Reptile list, generated from the iNaturalist Database;
- Avifauna list, generated from the SABAP2 dataset by looking at pentads: 2745_2645; 2745_2650; 2745_2655; 2745_2700; 2745_2705; 2745_2710; 2750_2710; 2755_2710; 2800_2710; 2805_2710; 2810_2710; 2815_2710; 2820_2710; 2820_2705; 2820_2700; 2820_2655; 2820_2650; 2820_2645; 2815_2645; 2810_2645; 2805_2645; 2800_2645; 2755_2645; 2750_2645; 2745_2645; 2750_2645; 2750_2650; 2750_2655; 2750_2645; 2755_2640; 2755_2645; 2755_2650; 2755_2655; 2755_2700; 2755_2705; 2755_2710; 2800_2640; 2800_2645; 2800_2645; 2800_2650; 2800_2650; 2800_2655; 2800_2700; 2800_2705; 2800_2710; 2805_2640; 2805_2645; 2805_2650; 2805_2655; 2805_2700; 2805_2705; 2805_2710; 2805_2715.
- Mammal list, generated from the iNaturalist Database.

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

Provincially Protected Wildlife Species (Schedules 1, 2 and 3 of the Free State Nature Conservation Ordinance No.8 of 1969); and

Nationally Protected Wildlife species (The 2007 lists of Threatened or Protected Species (TOPS), published in terms of Section 56(1) of the NEM:BA No. 10 of 2004).

3.2 Terrestrial Site Ecological Importance

The different habitat types within the PAOI will be delineated and identified based on observations during the field assessment, and available satellite imagery. These habitat types will be assigned Ecological Importance (EI) categories based on their ecological integrity, conservation value, the presence of species of conservation concern 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 on the site) and Receptor Resilience (RR) (its resilience to impacts) as follows.

BI is a function of Conservation Importance (CI) and the Functional Integrity (FI) of the receptor as follows. The criteria for the CI and FI ratings are provided in Table 3-1 and Table 3-2, respectively.

Table 3-1 Summary of Conservation Importance (CI) criteria

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

Table 3-2 Summary of Functional Integrity (FI) criteria

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

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

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

Biodiversity Importance (BI)	Conservation Importance (CI)				
	Very high	High	Medium	Low	Very low
Very high	Very high	Very high	High	Medium	Low

Biodiversity Importance (BI)		Conservation Importance (CI)				
		Very high	High	Medium	Low	Very 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 3-4.

Table 3-4 Summary of Receptor Resilience (RR) criteria

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

Subsequent to the determination of the BI and RR, the SEI can be ascertained using the matrix as provided in Table 3-5.

Table 3-5 Matrix used to derive Site Ecological Importance from Receptor Resilience (RR) and Biodiversity Importance (BI)

Site Ecological Importance		Biodiversity Importance (BI)				
		Very high	High	Medium	Low	Very low
Receptor Resilience (RR)	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 3-6.

Table 3-6 Guidelines for interpreting Site Ecological Importance in the context of the proposed development 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.

Site Ecological Importance	Interpretation in relation to proposed development activities
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.

3.3 Wetland Assessment

3.3.1 Functional Assessment

Wetland Functionality refers to the ability of wetlands to provide healthy conditions for the wide variety of organisms found in wetlands and humans. EcoServices serve as the main factor contributing to wetland functionality.

The assessment of the ecosystem services supplied by the identified wetlands will be conducted per the guidelines as described in WET-EcoServices (Kotze *et al.* 2008). An assessment will be undertaken that examines and rates the following services according to their degree of importance and the degree to which the services are provided (Table 3-7).

Table 3-7 *Classes for determining the likely extent to which a benefit is being supplied*

Score	Rating of likely extent to which a benefit is being supplied
< 0.5	Low
0.6 - 1.2	Moderately Low
1.3 - 2.0	Intermediate
2.1 - 3.0	Moderately High
> 3.0	High

3.3.2 Present Ecological Status

The overall approach is to quantify the impacts of human activity or clearly visible impacts on wetland health, and then to convert the impact scores to a Present Ecological Status (PES) score. This takes the form of assessing the spatial extent of impact of individual activities/occurrences and then separately assessing the intensity of impact of each activity in the affected area. The extent and intensity are then combined to determine an overall magnitude of impact. The Present State categories are provided in Table 3-8.

Table 3-8 *The Present Ecological Status categories (Macfarlane *et al.*, 2009)*

Impact Category	Description	Impact Score Range	PES
None	Unmodified, natural	0 to 0.9	A
Small	Largely Natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place.	1.0 to 1.9	B

Moderate	Moderately Modified. A moderate change in ecosystem processes and loss of natural habitats has taken place, but the natural habitat remains predominantly intact.	2.0 to 3.9	C
Large	Largely Modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4.0 to 5.9	D
Serious	Seriously Modified. The change in ecosystem processes and loss of natural habitat and biota is great, but some remaining natural habitat features are still recognizable.	6.0 to 7.9	E
Critical	Critical Modification. The modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8.0 to 10	F

3.3.3 Importance and Sensitivity

The importance and sensitivity of water resources is determined to establish resources that provide higher than average ecosystem services, biodiversity support functions or are particularly sensitive to impacts. The mean of the determinants is used to assign the Importance and Sensitivity (IS) category, as listed in Table 3-9 (Rountree and Kotze, 2013).

Table 3-9 Description of Ecological Importance and Sensitivity categories

EIS Category	Range of Mean	Recommended Ecological Management Class
Very High	3.1 to 4.0	A
High	2.1 to 3.0	B
Moderate	1.1 to 2.0	C
Low Marginal	< 1.0	D

3.3.4 Determining Buffer Requirements

The “Preliminary Guideline for the Determination of Buffer Zones for Rivers, Wetlands and Estuaries” (Macfarlane *et al.*, 2014) will be used to determine the appropriate buffer zone for the proposed activity.

3.4 Soil assessment

3.4.1 Desktop Assessment

As part of the desktop assessment, baseline soil information was obtained using published South African Land Type Data. Land type data for the site was obtained from the Institute for Soil Climate and Water (ISCW) of the Agricultural Research Council (ARC) (Land Type Survey Staff, 1972 - 2006). The land type data is presented at a scale of 1:250 000 and comprises of the division of land into land types. In addition, a Digital Elevation Model (DEM) as well as the slope percentage of the area was calculated by means of the NASA Shuttle Radar Topography Mission Global 1 arc second digital elevation data by means of QGIS and SAGA software.

3.4.2 Land Capability

Land capability and agricultural potential will be determined by a combination of soil, terrain, and climate features. Land capability is defined by the most intensive long-term sustainable use of land under rain-fed conditions. At the same time an indication is given about the permanent limitations associated with the different land use classes.

Land capability is divided into eight classes, and these may be divided into three capability groups. Table 3-10 shows how the land classes and groups are arranged in order of decreasing capability and ranges of use. The risk of use increases from class I to class VIII (Smith, 2006).

Table 3-10 Land capability class and intensity of use (Smith, 2006)

Land Capability Class	Increased Intensity of Use									Land Capability Groups
I	W	F	LG	MG	IG	LC	MC	IC	VIC	Arable Land
II	W	F	LG	MG	IG	LC	MC	IC		
III	W	F	LG	MG	IG	LC	MC			
IV	W	F	LG	MG	IG	LC				
V	W	F	LG	MG						Grazing Land
VI	W	F	LG	MG						
VII	W	F	LG							
VIII	W									Wildlife
W - Wildlife		MG - Moderate Grazing			MC - Moderate Cultivation					
F - Forestry		IG - Intensive Grazing			IC - Intensive Cultivation					
LG - Light Grazing		LC - Light Cultivation			VIC - Very Intensive Cultivation					

The land capability was determined by using the guidelines described in “The farming handbook” (Smith, 2006) which the DAFF land capabilities were further developed from. Accordingly, the identified soil forms associated with the PAOI are restricted to land capability 2 and 3, categorised between LC 6-8 (Pinedene, Westleigh, Augrabies, Swartland and Glen soils) and land capability 8 (Witbank soil), categorised between LC 1-5. The baseline soil land capability was compared to the National Land Capability data (DAFF, 2017), respectively.

The land potential classes are further determined by combining the land capability results and the climate capability of a region as shown in the table below. The final land potential results are then described in the subsequent table.

Table 3-11 The combination table for land potential classification

Land capability class	Climate capability class							
	C1	C2	C3	C4	C5	C6	C7	C8
I	L1	L1	L2	L2	L3	L3	L4	L4
II	L1	L2	L2	L3	L3	L4	L4	L5
III	L2	L2	L3	L3	L4	L4	L5	L6
IV	L2	L3	L3	L4	L4	L5	L5	L6
V	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei	Vlei
VI	L4	L4	L5	L5	L5	L6	L6	L7
VII	L5	L5	L6	L6	L7	L7	L7	L8
VIII	L6	L6	L7	L7	L8	L8	L8	L8

Table 3-12 The Land Potential Classes

Land potential	Description of land potential class
L1	Very high potential: No limitations. Appropriate contour protection must be implemented and inspected.
L2	High potential: Very infrequent and/or minor limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.
L3	Good potential: Infrequent and/or moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate contour protection must be implemented and inspected.

L4	Moderate potential: Moderately regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall. Appropriate permission is required before ploughing virgin land.
L5	Restricted potential: Regular and/or severe to moderate limitations due to soil, slope, temperatures, or rainfall.
L6	Very restricted potential: Regular and/or severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L7	Low potential: Severe limitations due to soil, slope, temperatures, or rainfall. Non-arable
L8	Very low potential: Very severe limitations due to soil, slope, temperatures, or rainfall. Non-arable

The land capability of the proposed footprint will be compared to the National Land Capability which was refined in 2014- 2016. The National Land Capability methodology is based on a spatial evaluation modelling approach and a raster spatial data layer consisting of fifteen (15) land capability evaluation values (Table 3-13), usable on a scale of 1:50 000 – 1:100 000 (DAFF, 2017). The previous system is based on a classification approach, with 8 classes (Table 3-10). Land capability and land potential will also be determined in consideration of the screening tool to ultimately establish the accuracy of the land capability sensitivity from (DAFF, 2017).

Table 3-13 National Land Capability Values (DAFF,2017)

Land Capability Evaluation Value	Land Capability Description
1	Very low
2	
3	Very Low to Low
4	
5	Low
6	Low to Moderate
7	
8	Moderate
9	Moderate to High
10	
11	High
12	High to Very High
13	
14	Very High
15	

3.5 Assumptions and Limitations

- The following assumptions and limitations are applicable for this assessment:
- The assessment area was based on the area provided by the client and any alterations to the footprint and/or missing GIS information pertaining to the assessment area would have affected the area surveyed;
- The species likelihood of occurrence is based on desktop information; and
- The impact description included is preliminary and is solely based on the screening survey and desktop information.

4 Results & Discussion

4.1 Desktop Assessment

4.1.1 Ecologically Important Landscape Features

The relevance of the proposed development to ecologically important landscape features are summarised in Table 4-1.

Table 4-1 *Summary of relevance of the proposed project to ecologically important landscape features*

Desktop Information Considered	Relevance	Reasoning
Ecosystem Threat Status (RLE 2021)	Relevant	Overlaps with 'Endangered (EN) and 'Least Concern (LC)' ecosystems.
Ecosystem Protection Level	Relevant	Overlaps with 'Not Protected (NP)' and 'Poorly Protected (PP)' ecosystems.
Provincial Conservation Plan	Relevant	Overlaps with Other Natural Areas (ONAs), Ecological Support Areas 1 & 2 (ESAs 1 & 2), Degraded Areas (DAs) as well as Critical Biodiversity Areas 1 & 2 (CBAs 1 & 2).
South Africa Protected Areas Database - SAPAD and South Africa Conservation Areas Database - SACAD	Relevant	Overlaps with the Thabong Game Range and falls within >5 km of Tara Wildlife Safaris, Newlands Game Ranch, De Rust Private Nature Reserve and Goliatskraal Private Nature Reserve.
National Protected Areas Expansion Strategy (NPAES)	Relevant	The PAOI overlaps with NPAES Priority Focus Areas.
Key Biodiversity Areas (KBA)	Irrelevant	The nearest KBA is situated over 30 km from the PAOI.
South African Inventory of Inland Aquatic Ecosystems (SAIIAE)	Relevant	The PAOI overlaps with 'Least Concern' (LC) and 'Critically Endangered' (CR) wetlands.
National Freshwater Priority Area	Relevant	The PAOI overlaps with non-priority and priority FEPA wetlands.
Mining and Biodiversity Guidelines	Relevant	The PAOI overlaps with an area of Highest Biodiversity Importance.
Strategic Water Source Areas (SWSA)	Irrelevant	The PAOI does not overlap with any SWSA.
Coordinated Avifaunal Roadcount (CAR)	Relevant	Three CAR routes are located within the Project Area. FW19, FW20, FW49
Coordinated Waterbird Counts (CWAC)	Relevant	A CWAC location, Toronto Pan, is located approximately 11 km from the Project Area.

4.1.2 Ecosystem Threat Status

The Ecosystem Threat Status is an indicator of an ecosystem's wellbeing, based on the level of change in structure, function or composition. Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU), or Least Concern (LC), based on the proportion of the original extent of each ecosystem type that remains in good ecological condition. According to the spatial dataset the PAOI overlaps with EN and LC ecosystems (Figure 4-1).

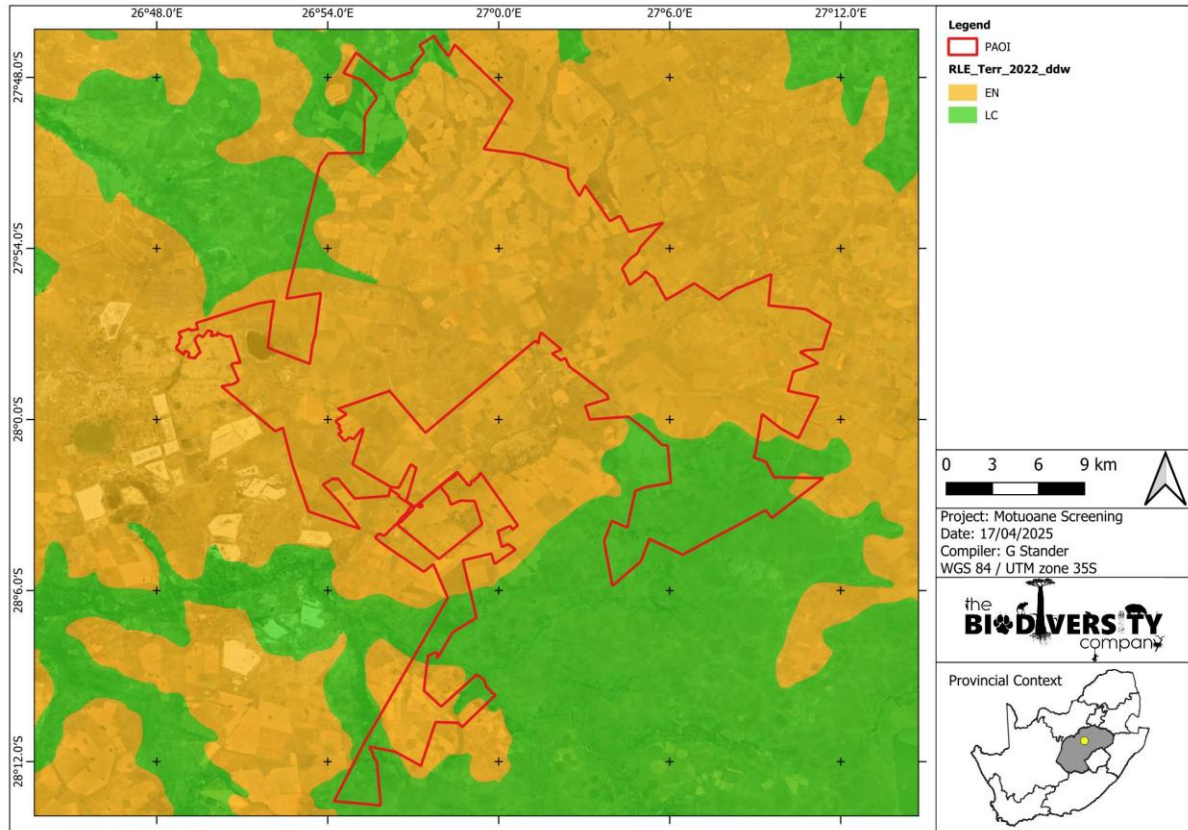


Figure 4-1 Map illustrating the ecosystem threat status associated with the PAOI

4.1.3 Ecosystem Protection Level

This is an 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. NP, PP or MP ecosystem types are collectively referred to as under-protected ecosystems. The PAOI overlaps with NP and PP ecosystems (Figure 4-2).

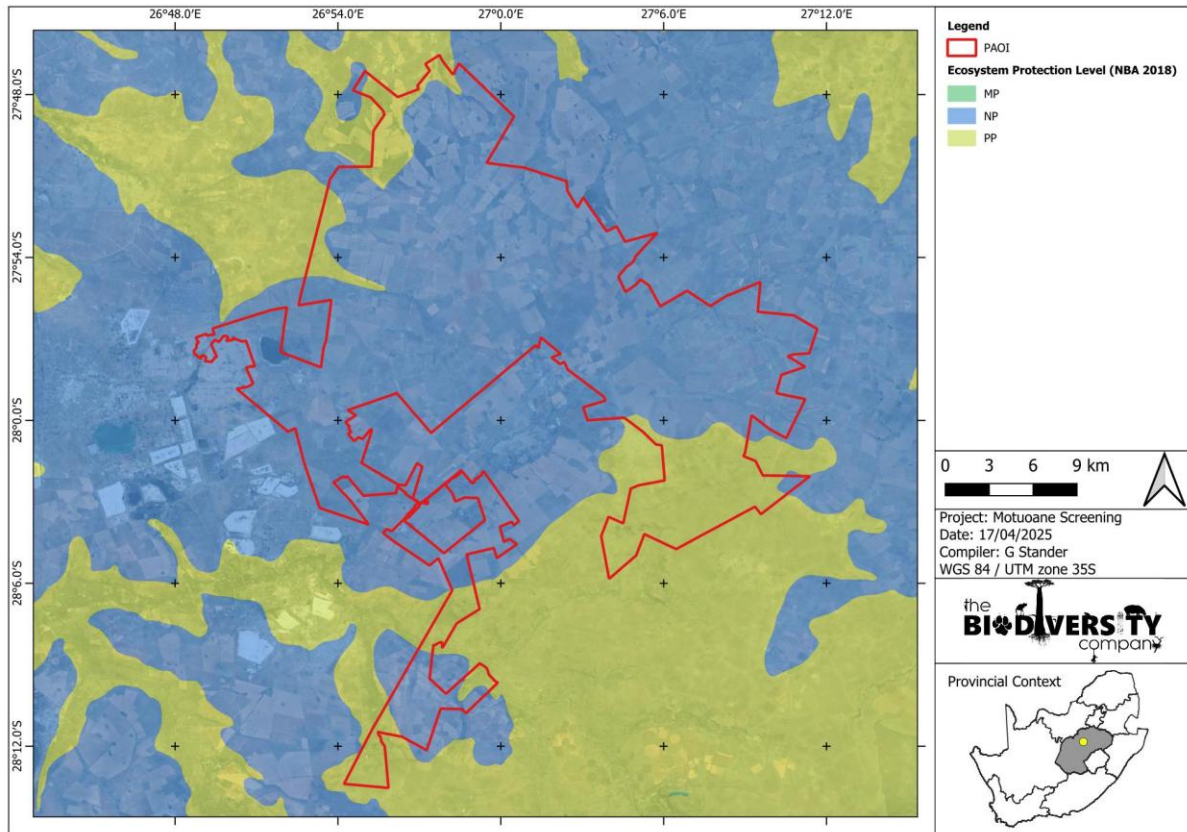


Figure 4-2 Map illustrating the ecosystem protection level associated with the PAOI.

4.1.4 Critical Biodiversity Areas and Ecological Support Areas

The Free State Conservation (Version 4) classified areas within the province on the basis of its contribution to reach the conservation targets within the province. These areas are classified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) to ensure sustainability in the long term. The CBAs are classified as either 'Irreplaceable' (must be conserved), or 'Important'.

Figure 4-3 shows the PAOI superimposed on the Free State Conservation Plan dataset. The PAOI overlaps ESAs 1 & 2, CBAs 1 & 2, DAs, as well as ONAs.

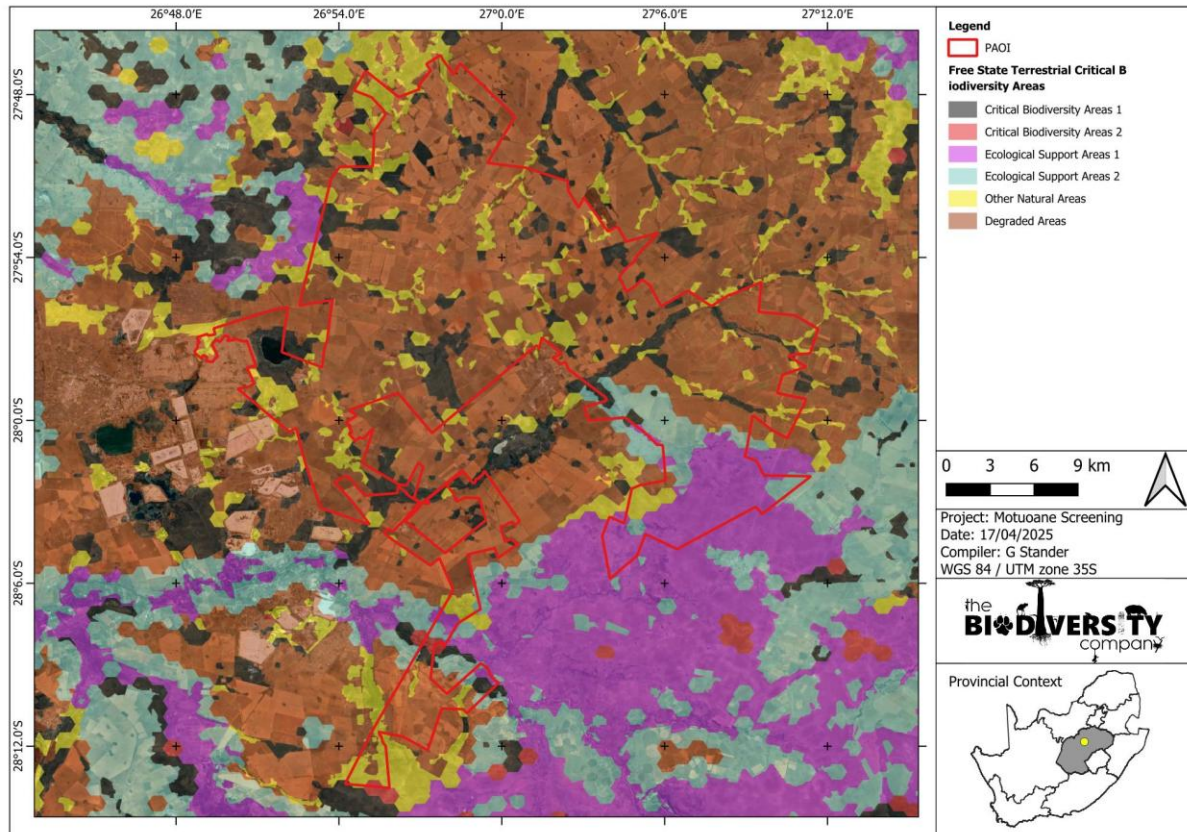


Figure 4-3 Map illustrating the PAOI in relation to the provincial conservation plan

4.1.5 Protected Areas

The Department of Forestry, Fisheries and the Environment maintains a spatial database on Protected Areas and Conservation Areas. Protected Areas and Conservation Areas (PACA) Database scheme that used for classifying protected areas (South Africa Protected Areas Database-SAPAD) and conservation areas (South Africa Conservation Areas Database-SACAD) into types and sub-types in South Africa.

The PAOI overlaps with the Thabong Game Reserve and falls within >5 km of Tara Wildlife Safaris, Newlands Game Ranch, De Rust Private Nature Reserve and Goliatskraal Private Nature Reserve (Figure 4-4)

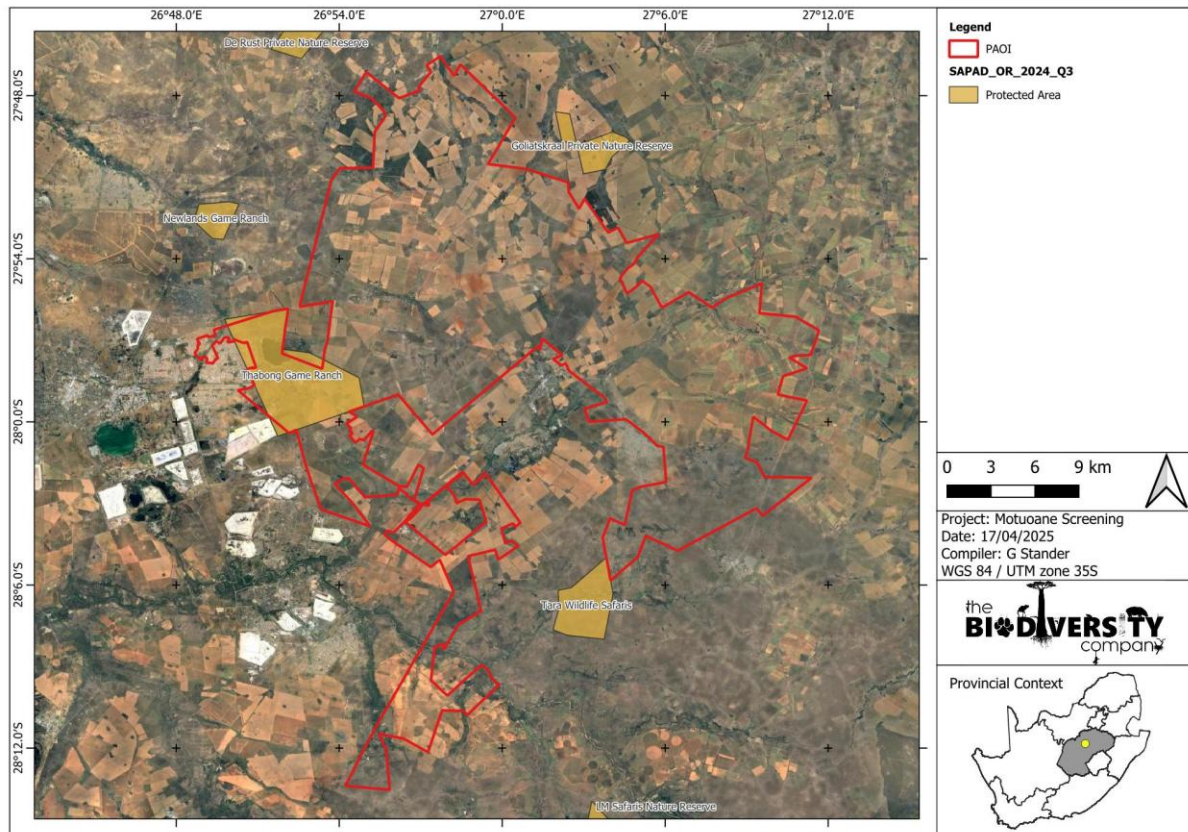


Figure 4-4 Map illustrating the PAOI in relation to the SAPAD areas

4.1.6 National Protected Area Expansion Strategy

National Protected Area Expansion Strategy 2010 (NPAES) were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2010).

The PAOI overlaps with NPAES Priority Focus Areas (Figure 4-5).

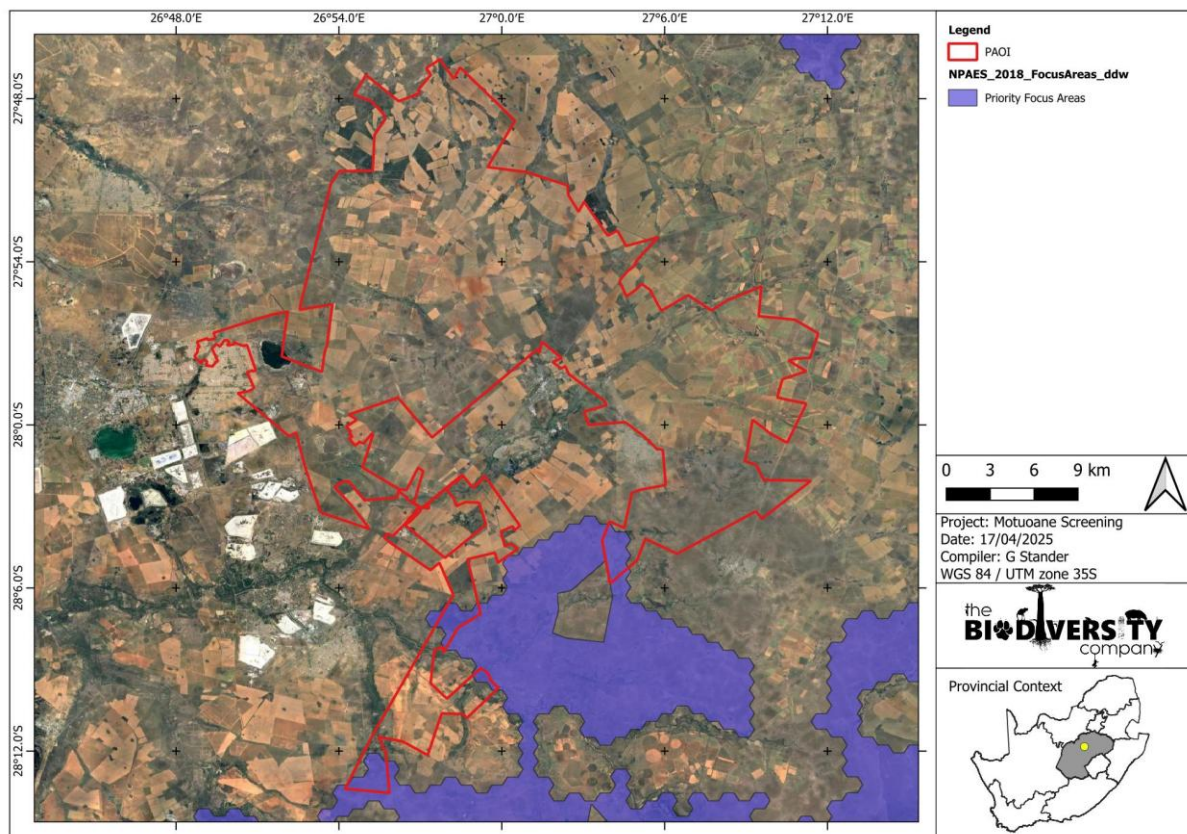


Figure 4-5 The PAOI in relation to the NPAES dataset

4.1.7 Freshwater Ecology

The South African Inventory of Inland Aquatic Ecosystems (SAIIAE) was released with the NBA 2018. Ecosystem threat status (ETS) of river and wetland ecosystem types are based on the extent to which each river ecosystem type had been altered from its natural condition. Ecosystem types are categorised as CR, EN, VU or LT, with CR, EN and VU ecosystem types collectively referred to as 'threatened' (Van Deventer *et al.*, 2019; Skowno *et al.*, 2019). The PAOI overlaps with a CR and LC wetlands (Figure 4-6).

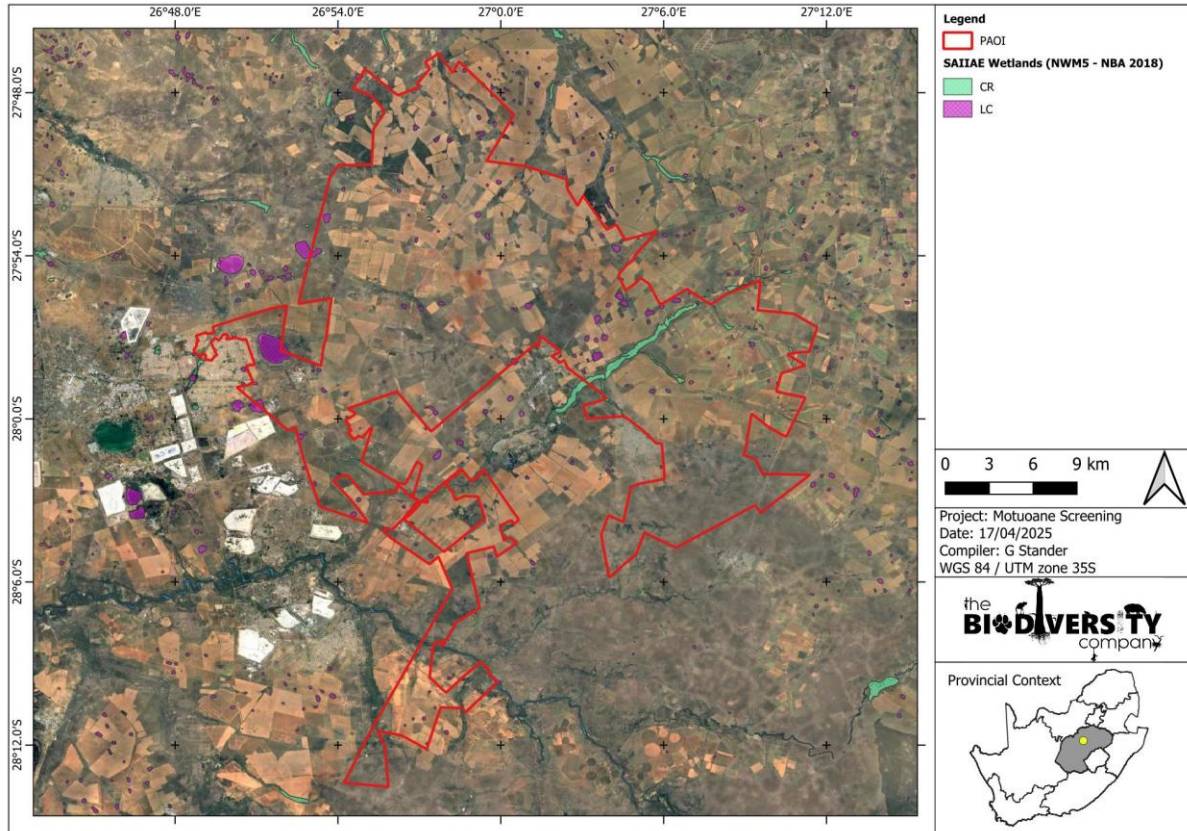


Figure 4-6 Map illustrating ecosystem threat status of rivers and wetlands in the PAOI.

4.1.8 National Freshwater Ecosystem Priority Area Status

To better conserve aquatic ecosystems, South Africa has categorised its river systems according to set ecological criteria (i.e., ecosystem representation, water yield, connectivity, unique features, and threatened taxa) to identify Freshwater Ecosystem Priority Areas (FEPAs) (Driver *et al.*, 2011). The FEPAs are intended to be conservation support tools and envisioned to guide the effective implementation of measures to achieve the National Environment Management Biodiversity Act's (NEM:BA) biodiversity goals (Nel *et al.*, 2011).

Figure 4-7 shows that the PAOI overlaps with non-priority and priority FEPA wetlands.

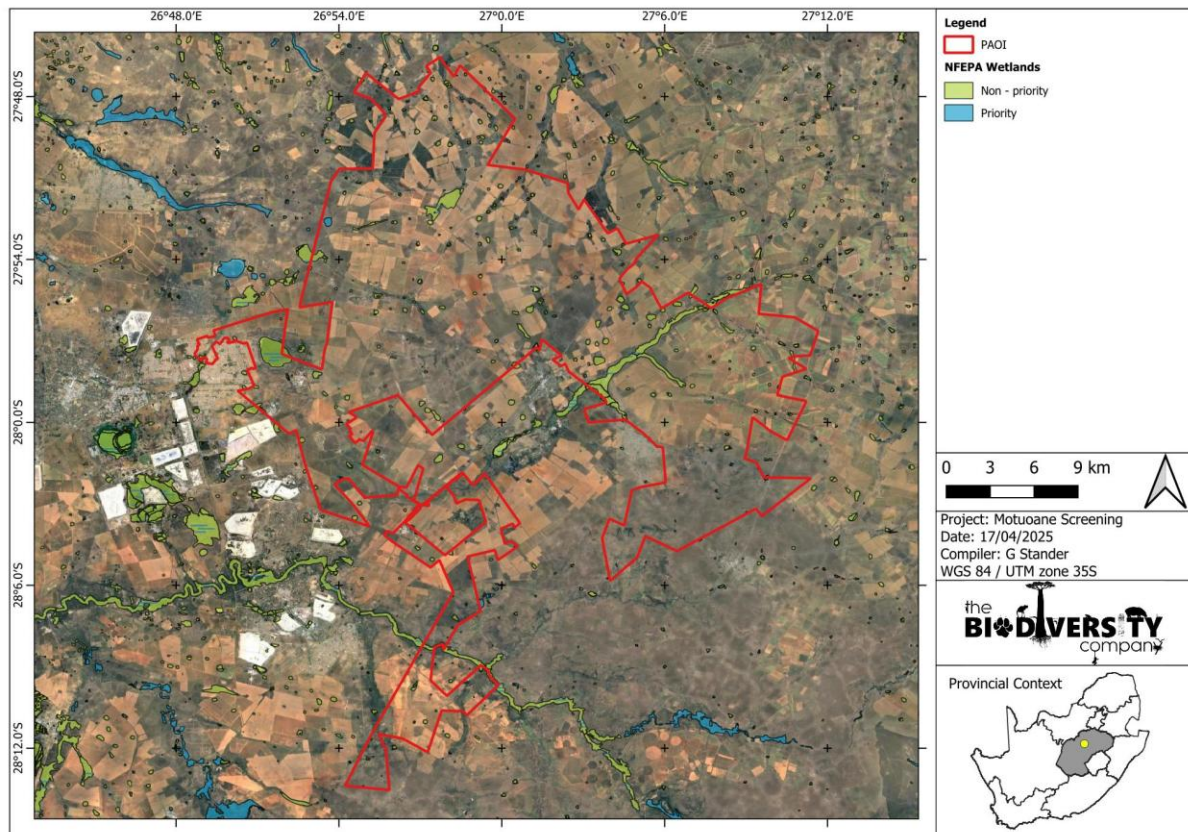


Figure 4-7 The PAOI in relation to the National Freshwater Ecosystem Priority Areas

4.1.9 Mining and Biodiversity Guidelines

According to the Mining and Biodiversity Guidelines spatial dataset (2013). The PAOI is of highest biodiversity importance, correlating to the highest risk for mining within the PAOI (Figure 4-8).

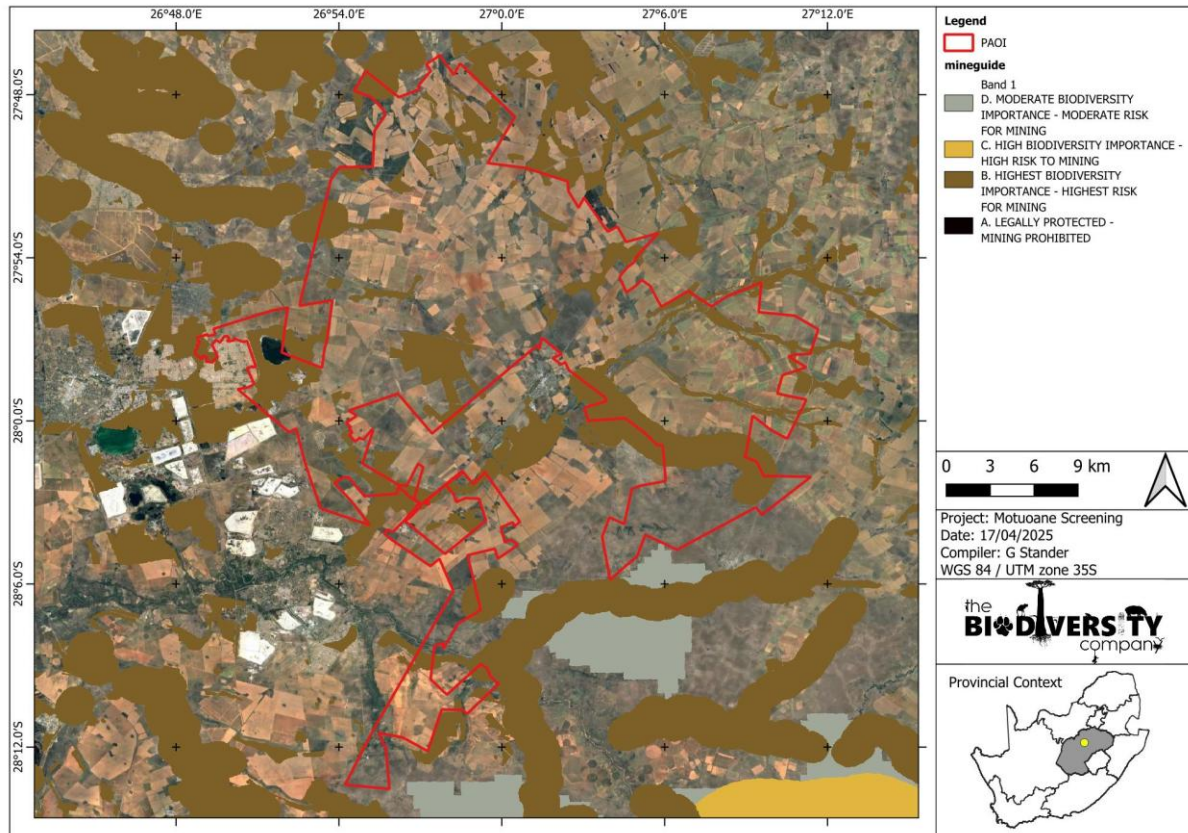


Figure 4-8 The PAOI in relation to the Mining Biodiversity Guidelines dataset

4.1.10 Strategic Transmission Corridors

On the 16 February 2018 Minister Edna Molewa published Government Notice No. 113 in Government Gazette No. 41445 which identified 5 strategic transmission corridors important for the planning of electricity transmission and distribution infrastructure as well as procedure to be followed when applying for environmental authorisation for electricity transmission and distribution expansion when occurring in these corridors.

On 29 April 2021, Minister Barbara Dallas Creecy published Government Notice No. 383 in Government Gazette No. 44504, which expanded the eastern and western transmission corridors and gave notice of the applicability of the application procedures identified in Government Notice No. 113, to these expanded corridors. More information on this can be obtained from <https://egis.environment.gov.za/egi>.

The PAOI overlaps with the Central Corridor (Figure 4-9).

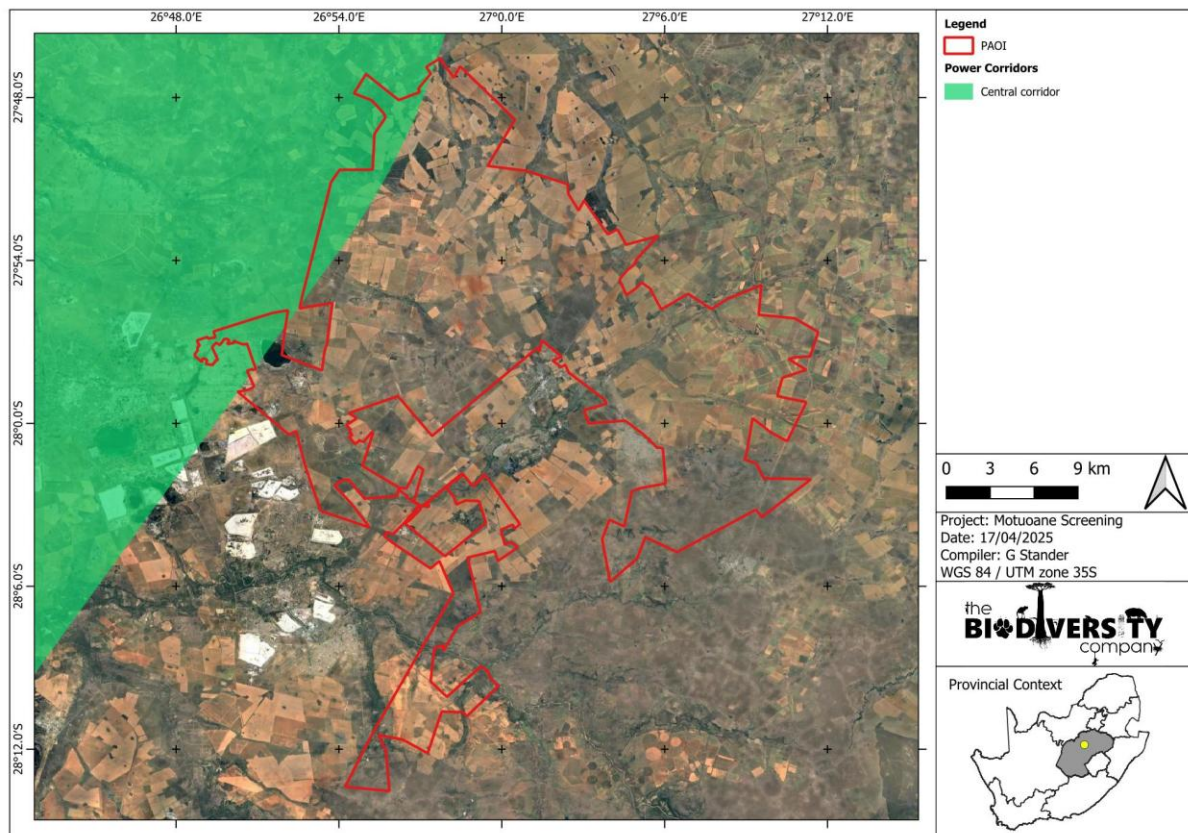


Figure 4-9 The PAOI in relation to the strategic transmission corridors dataset

4.1.11 Coordinated Avifaunal Roadcount (CAR)

The ADU/Cape bird club pioneered avifaunal roadcount of larger birds in 1993 in South Africa. Originally it was started to monitor the Blue Crane *Anthopoides paradiseus* and Denham's/Stanley's Bustard *Neotis denhami*. Today it has been expanded to the monitoring of 36 species of large terrestrial birds (cranes, bustards, korhaans, storks, Secretarybird and Southern Bald Ibis) along 350 fixed routes covering over 19 000 km. Twice a year, in midsummer (the last Saturday in January) and midwinter (the last Saturday in July), roadcounts are carried out using this standardised method. These counts are important for the conservation of these larger species that are under threat due to loss of habitat through changes in land use, increases in crop agriculture and human population densities, poisoning as well as man-made structures like power lines. With the prospect of wind and solar farms to increase the use of renewable energy sources monitoring of these species is most important (CAR, 2020).

Three CAR routes are located within the Project Area: FW19, FW20, FW49 (Figure 4-10).

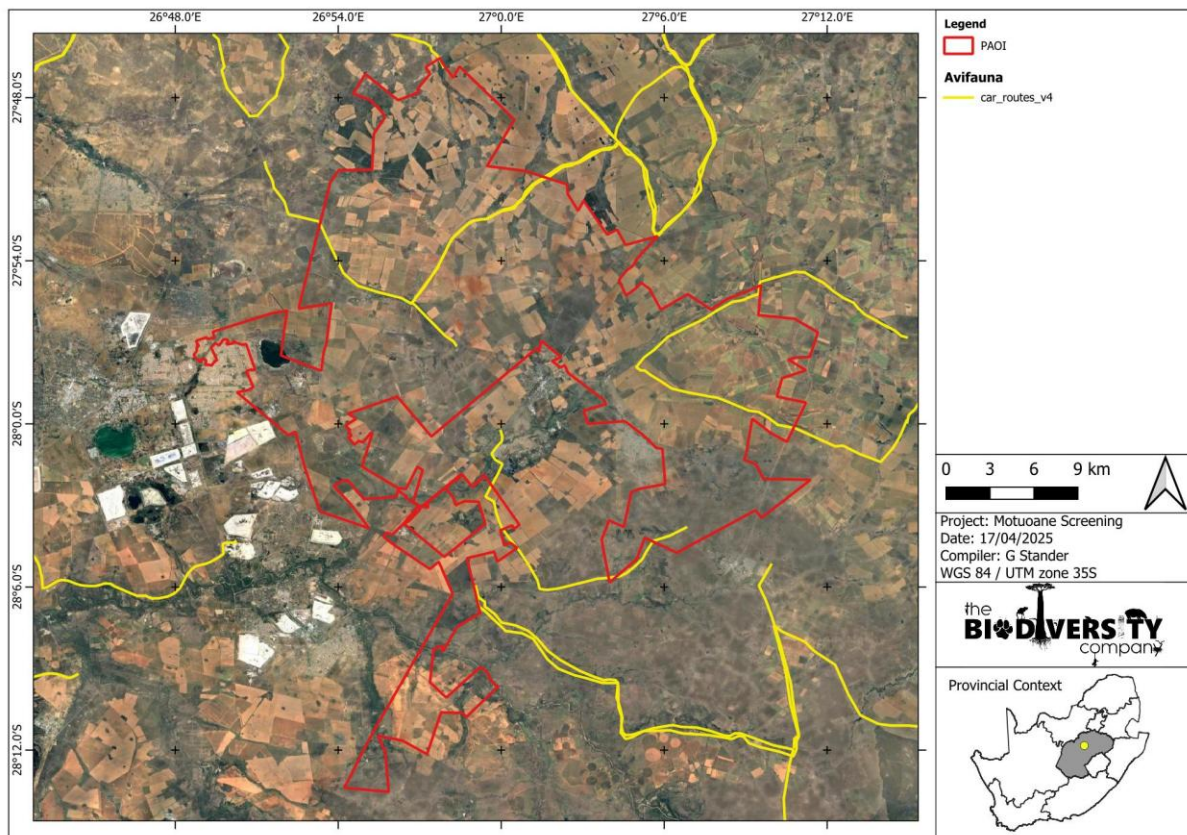


Figure 4-10 The PAOI in relation to the CAR dataset

4.1.12 Coordinated Waterbird Count (CWAC)

The Animal demographic unit launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part South Africa's commitment to international waterbird conservation. Regular mid-summer and mid-winter censuses are done to determine the various features of water birds including population size, how waterbirds utilise water sources and determining the health of wetlands. For a full description of CWAC please refer to <http://cwac.birdmap.africa/about.php>.

The Project Area is situated approximately 11 km from the nearest CWAC sites (Flamingo pan, Toronto pan and St Helena Mine Dams) (Figure 4-11).

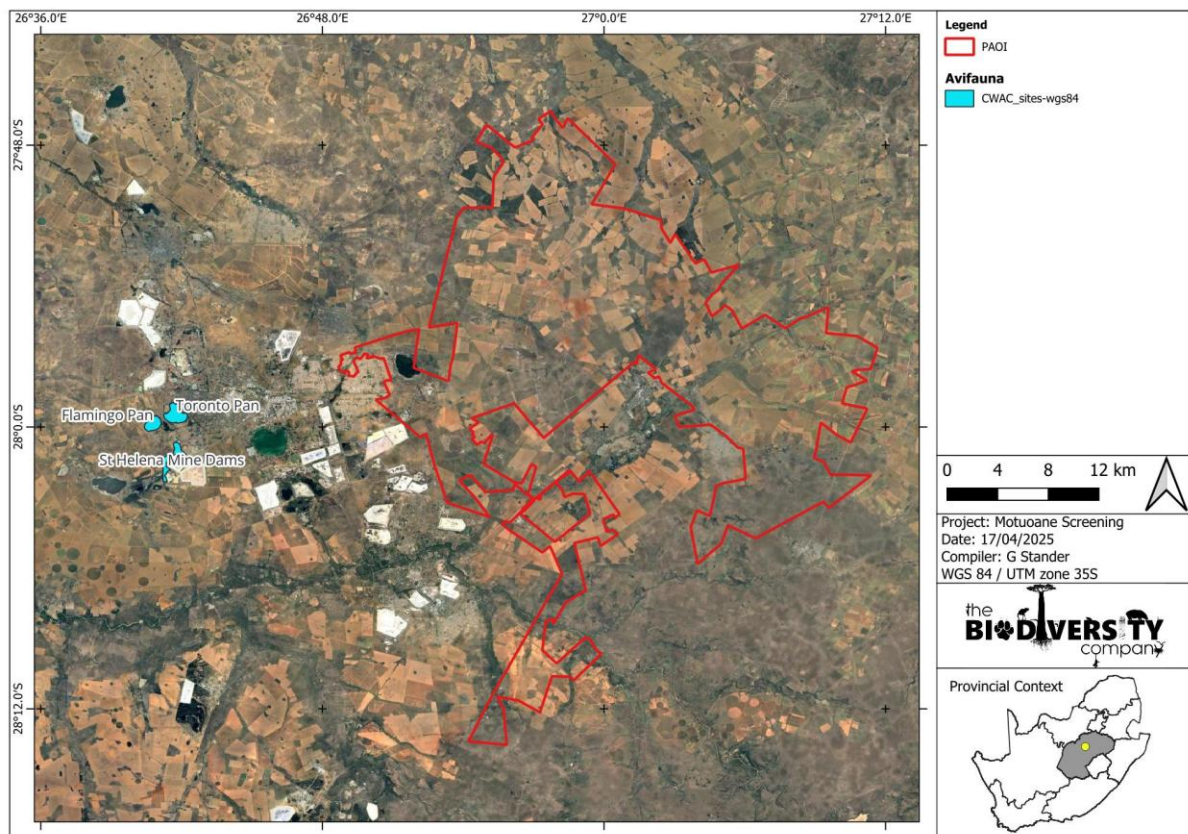


Figure 4-11 The PAOI in relation to the CWAC dataset

4.1.13 Geology and Soil

According to the land type database (Land Type Survey Staff, 1972 – 2006), the PAOI is characterized by the Bb1, Dc12, Dc8, Bd19, Bd21, Bd20, Ea40, Dc9 land types (Figure 4-12). Figure 4-13 illustrates the respective terrain units relative to the most prevalent land use type. The associated land capability ranges from Very Low-Low (02) to Moderate-High (10), and can be seen in Figure 4-14.

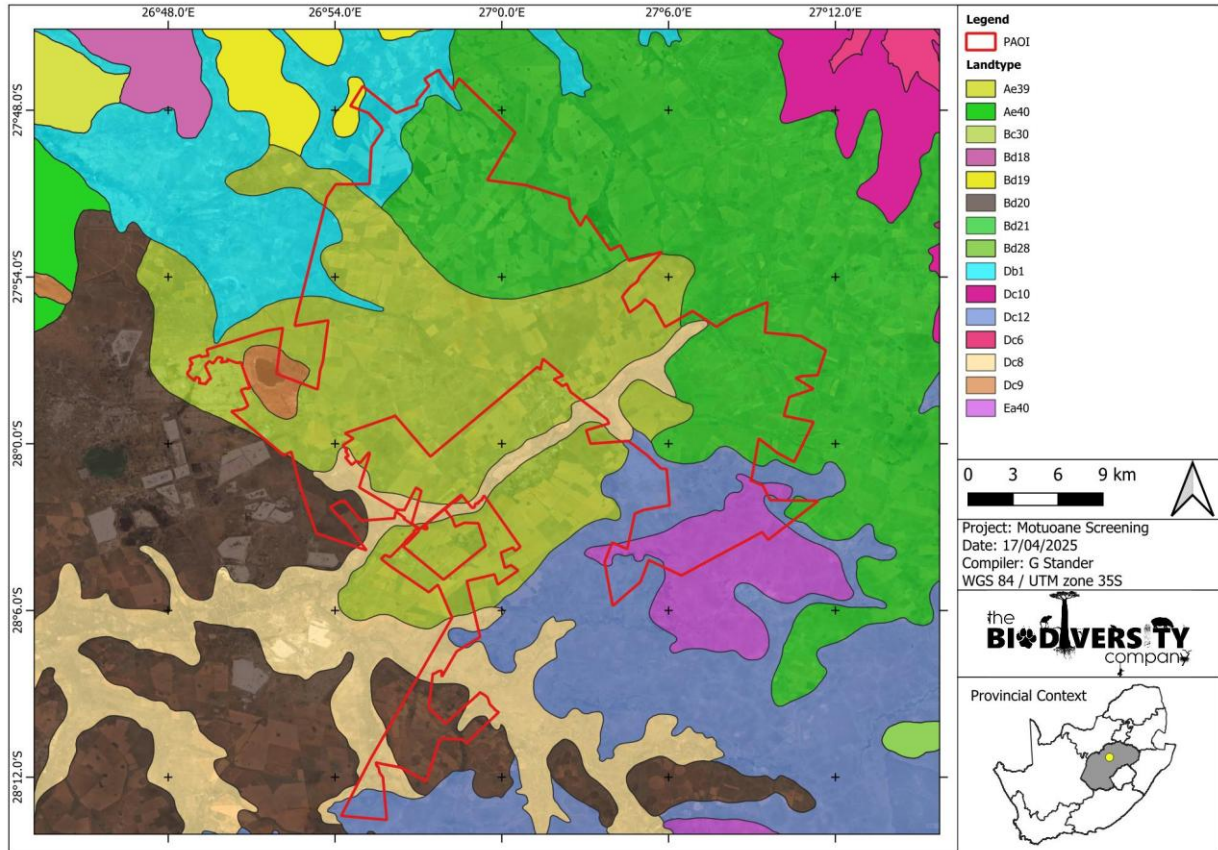


Figure 4-12 The land type associated with the PAOI

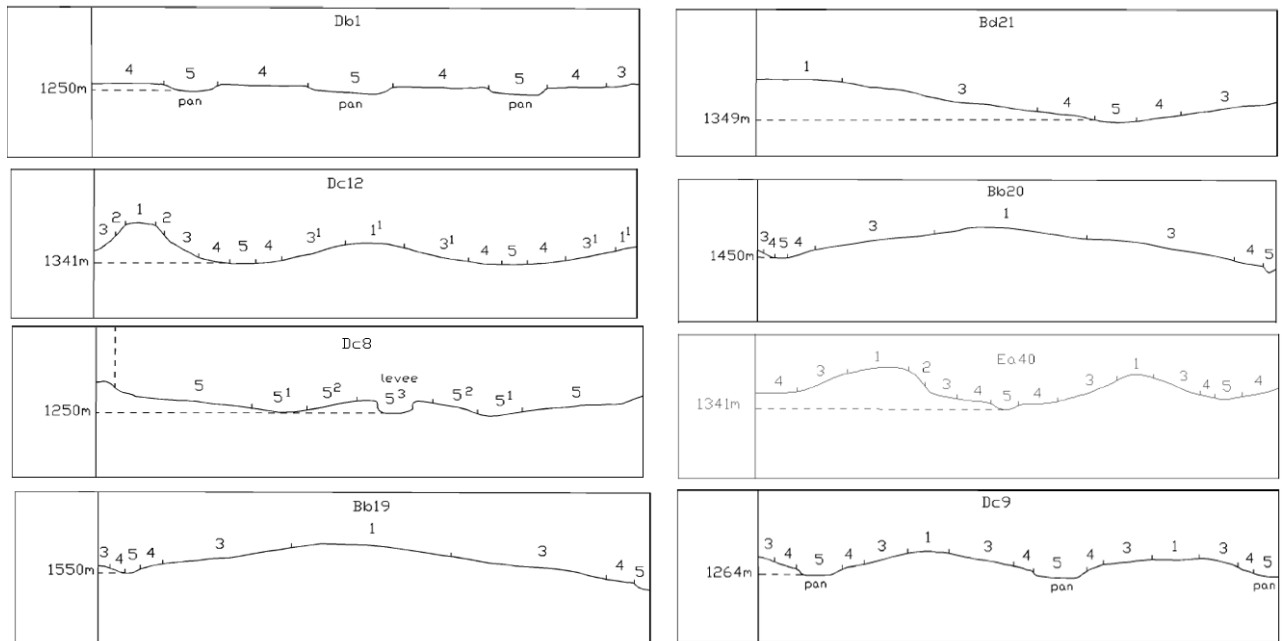


Figure 4-13 Illustration of Bb1, Dc12, Dc8, Bd19, Bd21, Bd20, Ea40, Dc9 and type terrain units (Land Type Survey Staff, 1972 – 2006)

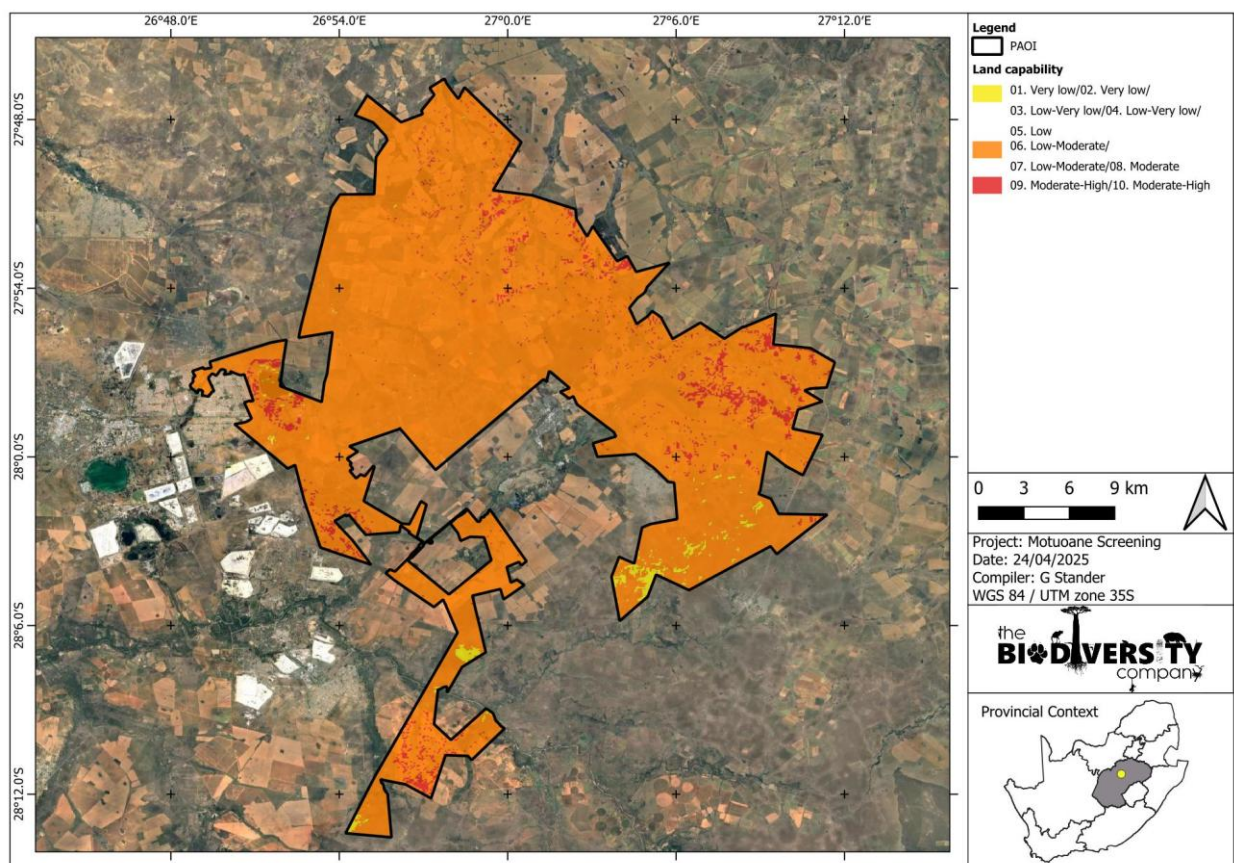


Figure 4-14 The land capability associated with the PAOI

4.1.14 Vegetation

The PAOI is situated in the Grassland biome.

The Grassland Biome is centrally located in southern Africa, and adjoins all except the desert, fynbos, and succulent Karoo biomes (Mucina & Rutherford, 2006). Major macroclimatic traits that characterise the grassland biome include:

Seasonal precipitation; and

The minimum temperatures in winter (Mucina & Rutherford, 2006).

The grassland biome is found chiefly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal and the Eastern Cape. The topography is mainly flat and rolling but includes the escarpment itself. Altitude varies from near sea level to 2 850 m above sea level.

Grasslands are dominated by a single layer of grasses. The amount of cover depends on rainfall and the degree of grazing. The grassland biome experiences summer rainfall and dry winters with frost (and fire), which are unfavourable for tree growth. Thus, trees are typically absent, except in a few localized habitats. Geophytes (bulbs) are often abundant. Frosts, fire, and grazing maintain the grass dominance and prevent the establishment of trees.

The PAOI overlaps with the Vaal-Vet Sandy Grassland, Central Free State Grassland, Highveld Alluvia Vegetation and the Winburg Grassy Shrubland vegetation types (Figure 4-15).

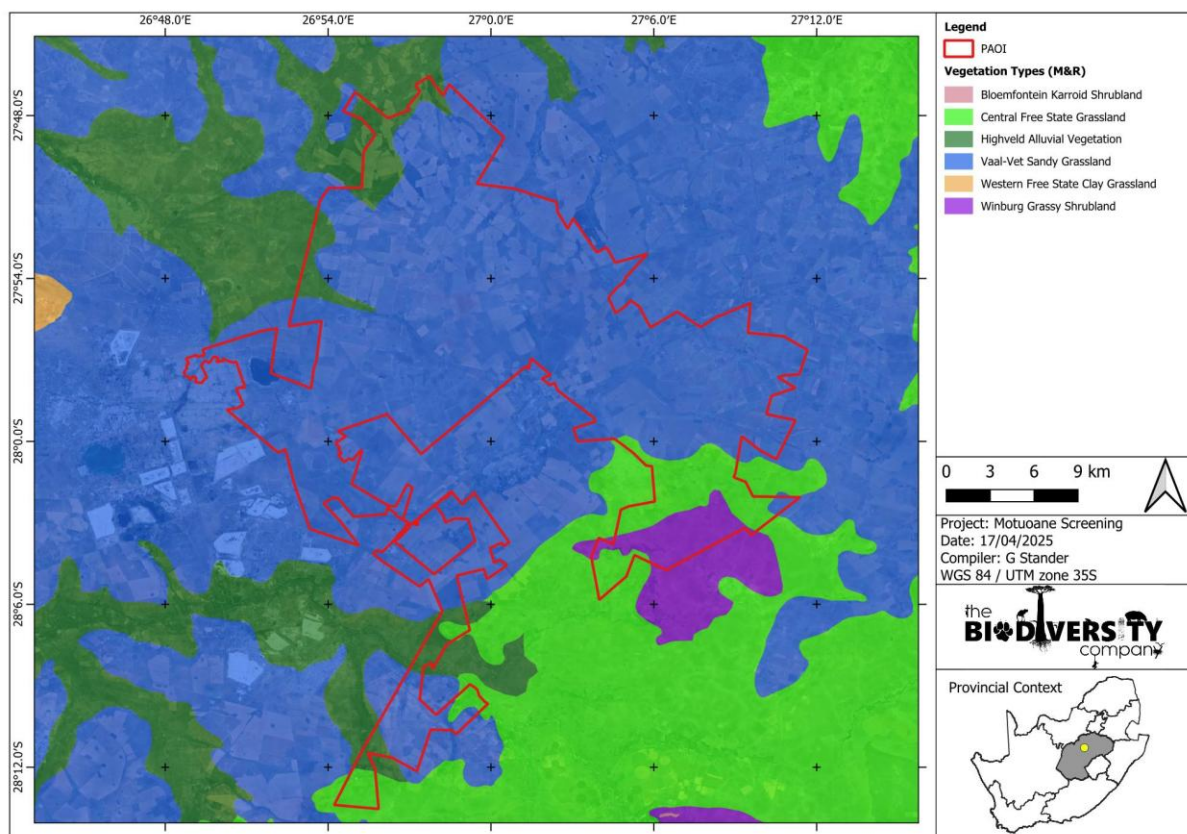


Figure 4-15 Vegetation types associated with the PAOI.

4.1.14.1 Vaal-Vet Sandy Grassland

The Vaal-Vet Sandy Grassland is found within the North-West and Free State Provinces. It spans south of Lichtenburg and Ventersdorp, stretching southwards to Klerksdorp, Leeudoringstad, Bothaville and to the Brandfort area north of Bloemfontein. The altitude ranges from 1220 – 1560 meters, generally between 1260 -1360 meters. The landscape is plains-dominated with some scattered, slightly irregular undulating plains and hills. Mainly low-tussock grasslands with an abundant karroid element.

Important Plant Taxa

Graminoids: *Antheophora pubescens* (d), *Aristida congesta* (d), *Chloris virgata* (d), *Cymbopogon caesius* (d), *Cynodon dactylon* (d), *Digitaria argyrograpta* (d), *Elionurus muticus* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. plana* (d), *E. trichophora* (d), *Heteropogon contortus* (d), *Panicum gilvum* (d), *Setaria sphacelata* (d), *Themeda triandra* (d), *Tragus berteronianus* (d), *Brachiaria serrata*, *Cymbopogon pospischilii*, *Digitaria eriantha*, *Eragrostis curvula*, *E. obtusa*, *E. superba*, *Panicum coloratum*, *Pogonarthria squarrosa*, *Trichoneura grandiglumis*, *Triraphis andropogonoides*.

Herbs: *Stachys spathulata* (d), *Barleria macrostegia*, *Berkheya onopordifolia* var. *onopordifolia*, *Chamaesyce inaequilatera*, *Geigeria aspera* var. *aspera*, *Helichrysum caespitium*, *Hermannia depressa*, *Hibiscus pusillus*, *Monsonia burkeana*, *Rhynchosia adenodes*, *Selago densiflora*, *Vernonia oligocephala*.

Geophytic Herbs: *Bulbine narcissifolia*, *Ledebouria marginata*.

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

Low Shrubs: *Felicia muricata* (d), *Pentzia globosa* (d), *Anthospermum rigidum* subsp. *pumilum*, *Helichrysum dregeanum*, *H. paronychioides*, *Ziziphus zeyheriana*.

Conservation Status of the Vegetation Type

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

4.1.14.2 Central Free State Grassland

The Central Free State Grassland is found within the Free State and marginally into the Gauteng Provinces. It spans from around Sasolburg in the north to Dewetsdorp in the south. Other major settlements located within this unit include Kroonstad, Ventersburg, Steynsrus, Winburg, Lindley and Edenville. The altitude ranges from 1300 – 11640 meters, generally between 1400 -1460 meters. The landscape is made up of undulating plains supporting short grassland, in natural condition dominated by *Themeda triandra* while *Eragrostis curvula* and *E. chloromelas* become dominant in degraded habitats.

Important Plant Taxa

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

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

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

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

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

Conservation Status of the Vegetation Type

The Central Free State Grassland is classified as Vulnerable, with a national conservation target of 24%. A small extent is conserved in statutory areas such as the Willem Pretorius, Rustfontein and Koppies Dam Nature Reserves as well as some protection in private nature reserves. Almost a quarter of the area has been transformed either for cultivation or by building of dams (Allemanskraal, Erfenis, Groothoek, Koppies, Kroonstad, Lace Mine, Rustfontein and Weltevrede). No serious infestation by alien flora has been observed, but encroachment of dwarf karoo shrubs becomes a problem in the degraded southern parts of this vegetation unit (Mucina & Rutherford, 2006).

4.1.14.3 Highveld Alluvial Vegetation

The Highveld Alluvial Vegetation occurs in the Free State, Mpumalanga and Gauteng provinces. It is made up of alluvial drainage lines and floodplains along rivers embedded within the Grassland Biome and marginal (eastern) units of the Kalahari (Savanna Biome), such as along upper Riet, Harts, upper Modder, upper Caledon, Vet, Sand, Vals, Wilge, Mooi, middle and upper Vaal Rivers etc. and their numerous tributaries. The altitude ranges from 1000 -1500 meters.

Important Plant Taxa

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

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

Woody Climber: *Clematis brachiata*.

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

Herb: *Pollichia campestris*.

Reed beds: *Phragmites australis* (d).

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

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

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

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

Conservation Status of the Vegetation Type

The Highveld Alluvia Vegetation is of Least Concern, with a national conservation target of 31%. Nearly 10% is statutorily conserved in the Barberspan (a Ramsar site), Bloemhof Dam, Christiana, Faan Meintjes, Sandveld, Schoonspruit, Soetdoring and Wolwespruit Nature Reserves. More than a quarter has been transformed for cultivation and by building of dams (Bloemhof, Erfenis, Krugersdrif, Mockes and Vaalharts Dams).

4.1.14.4 Windburg Grassy Shrubland

The Windburg Grassy Shrubland is located primarily in the Free State Province. There are a series of larger patches between Trompsburg through Bloemfontein and Winburg to Ventersburg. The altitude ranges from 1,300 to 1,660 meters, predominantly between 1,360 and 1,440 meters. The landscape features solitary hills, slopes and escarpments of mesas creating a mosaic of habitats ranging from open grassland to shrubland (Mucina & Rutherford, 2006).

Important Plant Taxa

Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *A. diffusa* (d), *Cymbopogon pospischilii* (d), *Cynodon dactylon* (d), *C. incompletus* (d), *Eragrostis chloromelas* (d), *E. lehmanniana* (d), *E. micrantha* (d), *E. obtusa* (d), *E. trichophora* (d), *Eustachys paspaloides* (d), *Heteropogon contortus* (d), *Panicum stapfianum* (d), *Setaria lindenberghiana* (d), *S. sphacelata* (d), *Sporobolus fimbriatus* (d), *Themeda triandra* (d), *Tragus koelerioides* (d), *Digitaria argyrograptus*, *Elionurus muticus*, *Enneapogon scoparius*, *Eragrostis plana*, *E. superba*, *Tragus berteronianus*, *T. racemosus*, *Triraphis andropogonoides*.

Small Trees: *Vachellia karroo*, *Celtis africana*, *Cussonia paniculata*, *Pittosporum viridiflorum*, *Searsia lancea*, *Scolopia zeyheri*, *Ziziphus mucronata*.

Tall Shrubs: *Buddleja saligna* (d), *Euclea crispa* subsp. *ovata* (d), *Gymnosporia polyacantha* (d), *Olea europaea* subsp. *africana* (d), *Rhus burchellii* (d), *R. erosa* (d), *Diospyros lycioides* subsp. *lycioides*, *Grewia occidentalis*, *Gymnosporia buxifolia*, *Tarchonanthus camphoratus*.

Herbs: *Berkheya onopordifolia* var. *onopordifolia*, *Hermannia coccocarpa*, *Indigofera alternans*, *Mohria caffrorum*, *Pupalia lappacea*, *Salvia repens*

Low Shrubs: *Helichrysum dregeanum* (d), *Pentzia globosa* (d), *Anthospermum rigidum* subsp. *pumilum*, *Asparagus cooperi*, *A. laricinus*, *Berkheya annectens*, *Chrysocoma ciliata*, *Clutia pulchella*, *Euryops empetrifolius*, *Felicia filifolia* subsp. *filifolia*, *F. muricata*, *Nenax microphylla*, *Osyris lanceolata*, *Rosenia humilis*, *Selago saxatilis*, *Solanum tomentosum* var. *coccineum*.

Conservation Status of the Vegetation Type

The Winburg Grassy Shrubland is classified as Least Threatened, with a national conservation target of 28%. A small extent is conserved in statutory areas such as the Willem Pretorius Nature Reserve. Around 10% of this vegetation type has been transformed due to urban expansion and cultivation (Mucina & Rutherford, 2006).

4.1.15 Flora Description

The POSA database indicates that 243 species of plants are expected to occur within the PAOI, of which 215 are indigenous. The full list of species will be provided in the final report. The POSA database does not indicate the likely presence of any SCC, similarly, the DFFE Screening Tool does not list any extra SCC.

4.1.16 Faunal Description

4.1.16.1 Amphibians

Based on the iNaturalist database five (5) amphibian species have the potential to occur in the PAOI. One (1) of the expected species is an SCC. No additional amphibian SCC were listed by the screening tool.

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

4.1.16.2 Reptiles

Based on the iNaturalist database, fourteen (14) reptile species are expected to occur within the area, none of which are classified as SCC. The DFFE screening tool lists one (1) sensitive species which is described in Table 4-2.

Please note that the Screening Tool report includes lists of bird, mammal, reptile, amphibian, butterfly, and plant species of conservation concern known or expected to occur on the proposed development footprint. Some of these SCC are sensitive to illegal harvesting. Such species have had their names obscured and are listed as sensitive plant unique number / sensitive animal unique number. As per the best practise guideline that accompanies the protocol and screening tool, please, 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 4-2 *Threatened mammal species that are expected to occur within the PAOI. (VU = Vulnerable).*

Scientific Name	Common Name	Regional (SANBI)	Global (IUCN)	Screening Tool Sensitivity	Likelihood of Occurrence	Reason
<i>Sensitive species 15</i>	-	VU	VU	Medium-High	High	Suitable habitat and distribution; adaptable species

4.1.16.3 Mammals

The iNaturalist database lists eleven (11) mammal species that could be expected to occur within the area. Excluding large mammal species that are normally restricted to protected areas, one (1) SCC is likely to occur in the PAOI. One (1) additional species (two in total) is listed as sensitive according to the DFFE screening tool (Table 4-3).

Table 4-3 *Threatened mammal species that are expected to occur within the PAOI (NT = Near threatened; VU = Vulnerable).*

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

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

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

4.1.16.4 Avifauna

SABAP2 data indicate that 298 avifauna species are expected for the PAOI and surrounding areas. The Avifauna list was generated from the SABAP2 dataset by looking at pentads 2745_2645; 2745_2650; 2745_2655; 2745_2700; 2745_2705; 2745_2710; 2750_2710; 2755_2710; 2800_2710; 2805_2710; 2810_2710; 2815_2710; 2820_2710; 2820_2705; 2820_2700; 2820_2655; 2820_2650; 2820_2645; 2815_2645; 2810_2645; 2805_2645; 2800_2645; 2755_2645; 2750_2645; 2745_2645; 2750_2645; 2750_2650; 2750_2655; 2750_2645; 2755_2640; 2755_2645; 2755_2650; 2755_2655; 2755_2700; 2755_2705; 2755_2710; 2800_2640; 2800_2645; 2800_2645; 2800_2650; 2800_2650; 2800_2655; 2800_2700; 2800_2705; 2800_2710; 2805_2640; 2805_2645; 2805_2650; 2805_2655; 2805_2700; 2805_2705; 2805_2710; 2805_2715. Of these 298 avifauna species, 21 are considered SCC Table 4-4). The likelihood of occurrence within the PAOI are included here. The DEA screening tool lists three (3) high sensitivity species and one (1) medium sensitivity species. The likelihood of occurrence of these species will be determined following the site visit.

Table 4-4 **Threatened avifauna species that are expected to occur within the Project Area (LC = Least Concern, NT = Near Threatened, VU = Vulnerable, EN = Endangered, CR = Critically Endangered)**

Common Name	Scientific Name	Family Name	Regional*	Global*	Screening Tool	Likelihood of occurrence
Secretarybird	<i>Sagittarius serpentarius</i>	Sagittariidae	VU	EN	High	High
Maccoa Duck	<i>Oxyura maccoa</i>	Anatidae	NT	EN	-	Low
Martial Eagle	<i>Polemaetus bellicosus</i>	Accipitridae	EN	EN	-	Low
Tawny Eagle	<i>Aquila rapax</i>	Accipitridae	EN	VU	-	Low
Lanner Falcon	<i>Falco biarmicus</i>	Falconidae	VU	LC	-	High
Red-footed Falcon	<i>Falco vespertinus</i>	Falconidae	NT	VU	-	Low
Greater Flamingo	<i>Phoenicopterus roseus</i>	Phoenicopteridae	NT	LC	-	High
Lesser Flamingo	<i>Phoeniconaias minor</i>	Phoenicopteridae	NT	NT	-	High
African Marsh Harrier	<i>Circus ranivorus</i>	Accipitridae	EN	LC	-	Moderate
Southern Bald Ibis	<i>Geronticus calvus</i>	Threskiornithidae	VU	VU	-	Low
Blue Korhaan	<i>Eupodotis caerulescens</i>	Otididae	LC	NT	-	High
Greater Painted-snipe	<i>Rostratula benghalensis</i>	Rostratulidae	NT	LC	-	Moderate
Chestnut-banded Plover	<i>Charadrius pallidus</i>	Charadriidae	NT	LC	-	Low

Black-winged Pratincole	<i>Glareola nordmanni</i>	Glareolidae	NT	NT	-	Moderate
European Roller	<i>Coracias garrulus</i>	Coraciidae	NT	LC	-	High
Curlew Sandpiper	<i>Calidris ferruginea</i>	Scolopacidae	LC	NT	-	Moderate
Abdim's Stork	<i>Ciconia abdimii</i>	Ciconiidae	NT	LC	-	Low
Black Stork	<i>Ciconia nigra</i>	Ciconiidae	VU	LC	-	Low
Yellow-billed Stork	<i>Mycteria ibis</i>	Ciconiidae	EN	LC	High	Low
Caspian Tern	<i>Hydropogone caspia</i>	Laridae	VU	LC	Medium-High	Low
White-backed Vulture	<i>Gyps africanus</i>	Accipitridae	CR	CR	-	Low

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

Glareola nordmanni (Black-winged Pratincole) is a migratory species which is listed as NT both globally and regionally. This species has a very large range, breeding mostly in Europe and Russia, before migrating to southern Africa. Overall population declines of approximately 20% for this species are suspected (IUCN, 2017). This species generally occurs near water and damp meadows, or marshes overgrown with dense grass, which may be present within the PAOI. Due to its migratory nature, this species will only be present in South Africa for a few months during the year and will not breed locally.

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

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

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

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

from industries and collisions with powerlines (BirdLife International, 2019b). Larger and smaller water resources in and around the PAOI were found on a desktop basis and may be suitable for this species.

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

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

Phoeniconaias minor (Lesser Flamingo) is widely distributed throughout sub-Saharan Africa but mainly breeds in the Rift Valley Lakes in East Africa, with smaller breeding congregations in West Africa and southern Africa. This species is nomadic and makes extensive movements in response to environmental conditions and southern African populations are partially migratory, with many making regular movements from their breeding sites inland to coastal wetlands when not breeding (BirdLife International, 2018). The species is an obligate filter feeder and feeds during the night and early morning when the surface of the water is calm, primarily by swimming and filtering the algae near the surface. The global population has been estimated at between 2 220 000-3 240 000 individuals, with a declining population trend. The main threat is breeding habitat loss due to mining and hydro-electric power (BirdLife International, 2018). Further threats include effluents mining, pollution from sewage and heavy metal effluents from industries and collisions with powerlines. Larger and smaller water resources in and around the PAOI may be suitable for this species.

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

5 DFFE Screening Tool

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

- Terrestrial Biodiversity Theme sensitivity is Very High for the PAOI, due to the area overlapping with CBA 1, CBA 2, ESA 1, ESA 2, NPAES, an Endangered Vegetation type, two protected areas and a FEPA Sub catchment area (Figure 5-1);
- Plant Species Theme sensitivity is Low for the PAOI, with no sensitive species predicted to occurring within the PAOI (Figure 5-2);
- Animal Species Theme sensitivity is High for the PAOI, with the possibility of one (1) medium to high sensitivity reptile species, two (2) high sensitivity avifauna species, one (1) medium-high sensitivity avifauna species and one (1) medium sensitivity mammal species being present (Figure 5-3);
- Aquatic Biodiversity Theme sensitivity is Very High for the PAOI due to five (5) wetlands, three (3) rivers and one (1) FEPA Sub catchment area occurring within the PAOI (Figure 5-4); and
- Agriculture Potential Theme sensitivity is Very High for the PAOI, with the land capability ranging from Low-Moderate (06) to High-Very High (10) (
- Figure 5-5).

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 eiada@requests@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.

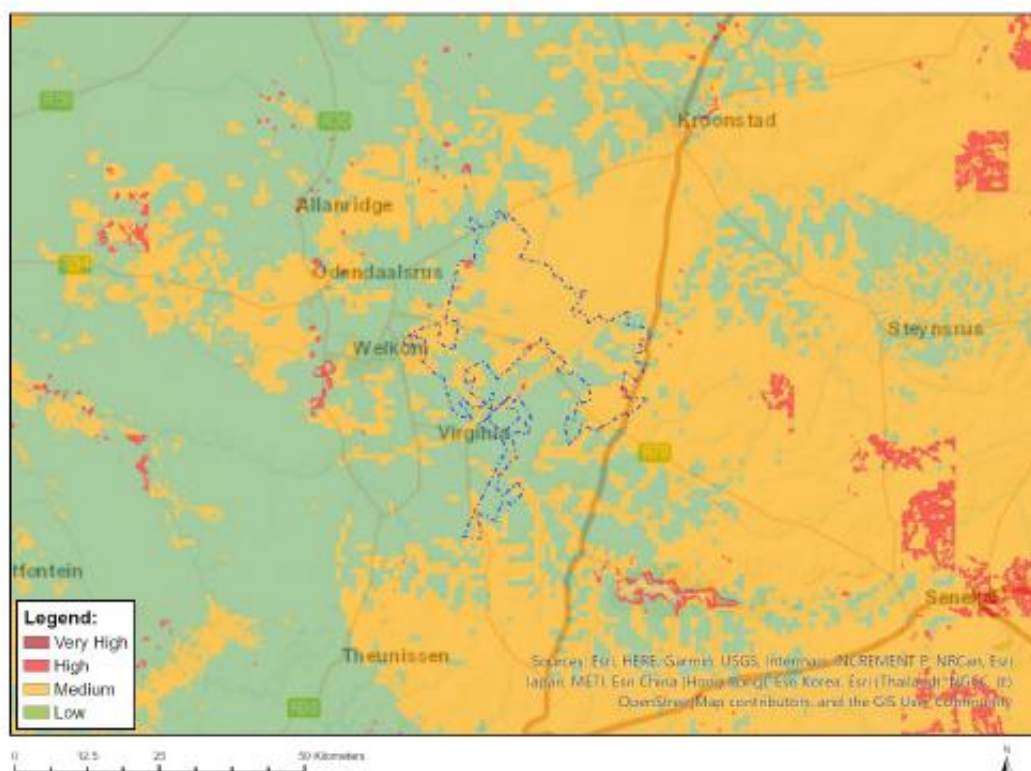
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			X

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity

Figure 5-2 The Plant 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 eiadat@requests@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.

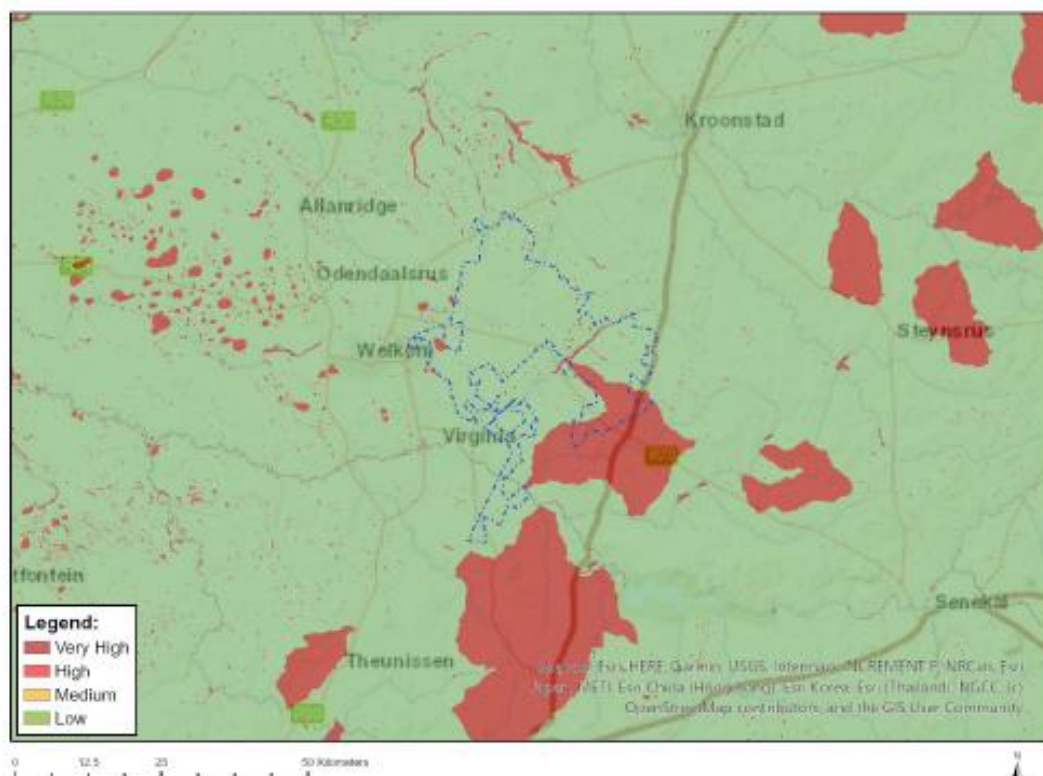
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Hydroprogne caspia
High	Aves-Sagittarius serpentarius
High	Aves-Mycteria ibis
High	Sensitive species 15
Low	Subject to confirmation
Medium	Aves-Hydroprogne caspia
Medium	Mammalia-Hydricis maculicollis
Medium	Sensitive species 15

Figure 5-3 The Animal Theme sensitivity for the PAOI.

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY



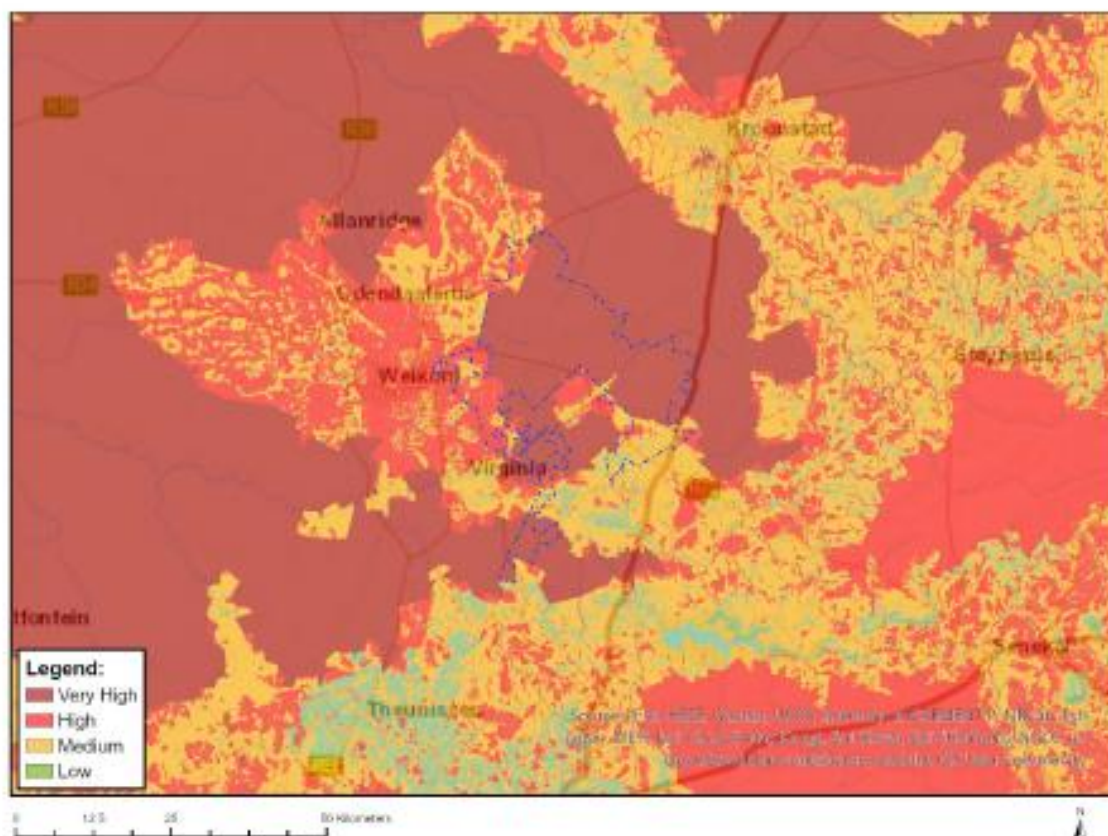
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low sensitivity
Very High	FEPA Subcatchment
Very High	Rivers_AB
Very High	Rivers_D
Very High	Rivers_Z
Very High	Wetlands_(River)
Very High	Wetlands_Dry Highveld Grassland Bioregion (Depression)
Very High	Wetlands_Dry Highveld Grassland Bioregion (Flood plain)
Very High	Wetlands_Dry Highveld Grassland Bioregion (Seep)
Very High	Wetlands_Dry Highveld Grassland Bioregion (valley-bottom)

Figure 5-4 The Aquatic Biodiversity Theme sensitivity for the PAOI

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Old Fields
High	Rained Annual Crop Cultivation / Planted Pastures
High	Small Holdings
High	CB. Moderate
High	CB. Moderate-High
Low	CB. Low-Very low
Low	CB. Low-Very low
Low	CB. Low
Medium	CB. Low-Moderate
Medium	CB. Low-Moderate

Very High	Horticulture
Very High	Pivot Irrigation
Very High	Welkom-Hennenman PAA
Very High	Virginia PAA

Figure 5-5 The Agriculture Theme sensitivity for the PAOI

5.1 Screening Tool Comparison

Table 5--1 to Table 5-3 provides a comparison between the Environmental Screening Tool and the specialist desktop determined Site Ecological Importance (SEI). The specialist-assigned sensitivity ratings are based on the SEI process and are desktop based – they will need to be confirmed following a site visit. Figure 5-6 to Figure 5-8 present the corresponding theme sensitivities for the project based on information available at the time of compiling this report. These sensitivities were prescribed from the DFFE Screening Tool and must be updated following a field assessment.

Table 5--1 ***Summary of the Screening Tool Sensitivity versus the Preliminary Specialist assigned sensitivity in terms of the terrestrial biodiversity theme.***

Screening Tool Theme	Screening Tool	Habitat	Tool Validated or Disputed by Specialist - Reasoning
Animal Theme	High	-	Subject to confirmation during seasonal surveys.
Plant Theme	Low	-	Subject to confirmation during seasonal surveys.
Terrestrial Theme	Very High	Disturbed grassland	Subject to confirmation during seasonal surveys.
		Degraded grassland	Subject to confirmation during seasonal surveys.
		Wetlands	Subject to confirmation during seasonal surveys.
		Modified	Subject to confirmation during seasonal surveys.

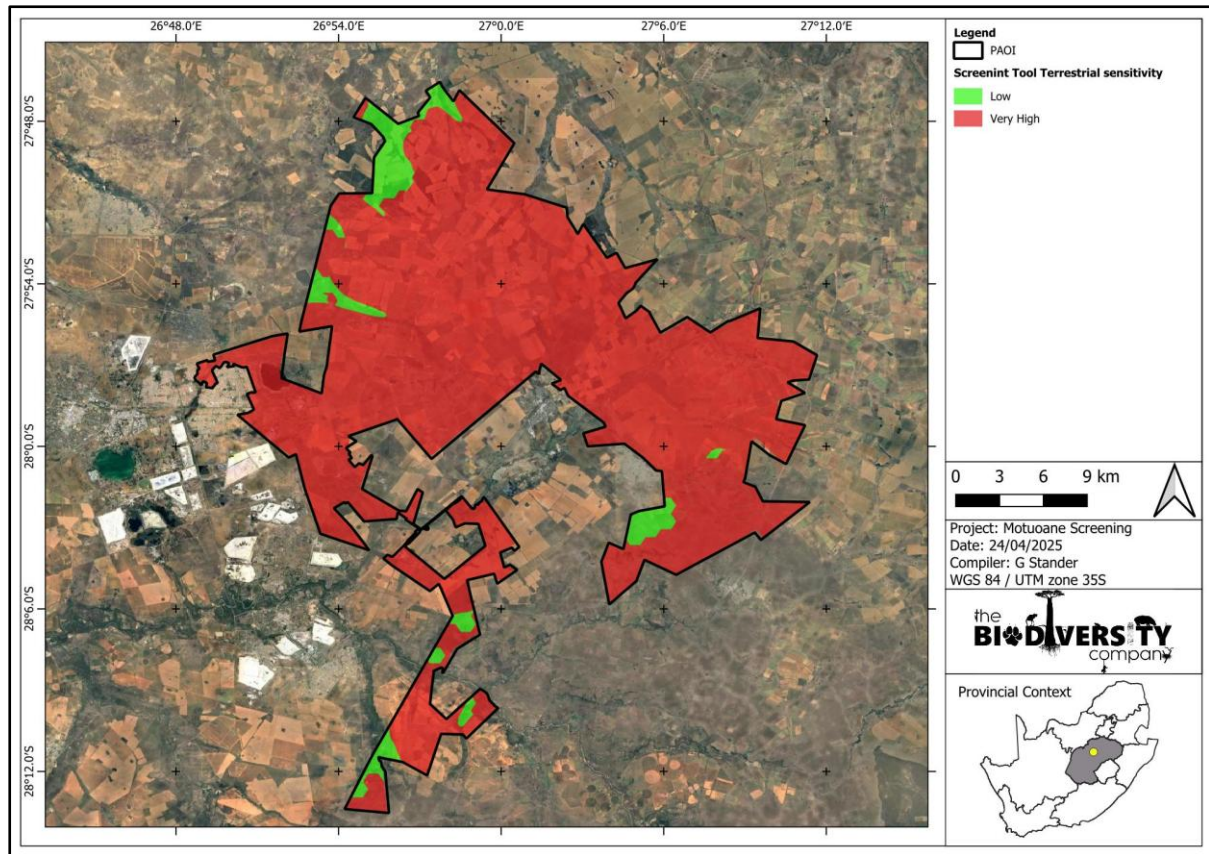


Figure 5-6 The site sensitivity for the Terrestrial biodiversity theme as per the DFFE Screening Tool

Table 5-2 *Summary of the Screening Tool Sensitivity versus the specialist assigned sensitivity in terms of aquatic biodiversity theme.*

Screening Tool Theme	Screening Tool	Habitat	Tool Validated or Disputed by Specialist - Reasoning
Aquatic Theme	Very High	FEPA sub catchment	Subject to confirmation during seasonal surveys.
		Rivers_AB	Subject to confirmation during seasonal surveys.
		Rivers_D	Subject to confirmation during seasonal surveys.
		Rivers_Z	Subject to confirmation during seasonal surveys.
		Wetlands (River)	Subject to confirmation during seasonal surveys.
		Wetlands_Dry Highveld Grassland Bioregion (Depression)	Subject to confirmation during seasonal surveys.
		Wetlands_Dry Highveld Grassland Bioregion (Floodplain)	Subject to confirmation during seasonal surveys.
		Wetlands_Dry Highveld Grassland Bioregion (Seep)	Subject to confirmation during seasonal surveys.
		Wetlands_Dry Highveld Grassland Bioregion (Valley-bottom)	Subject to confirmation during seasonal surveys.

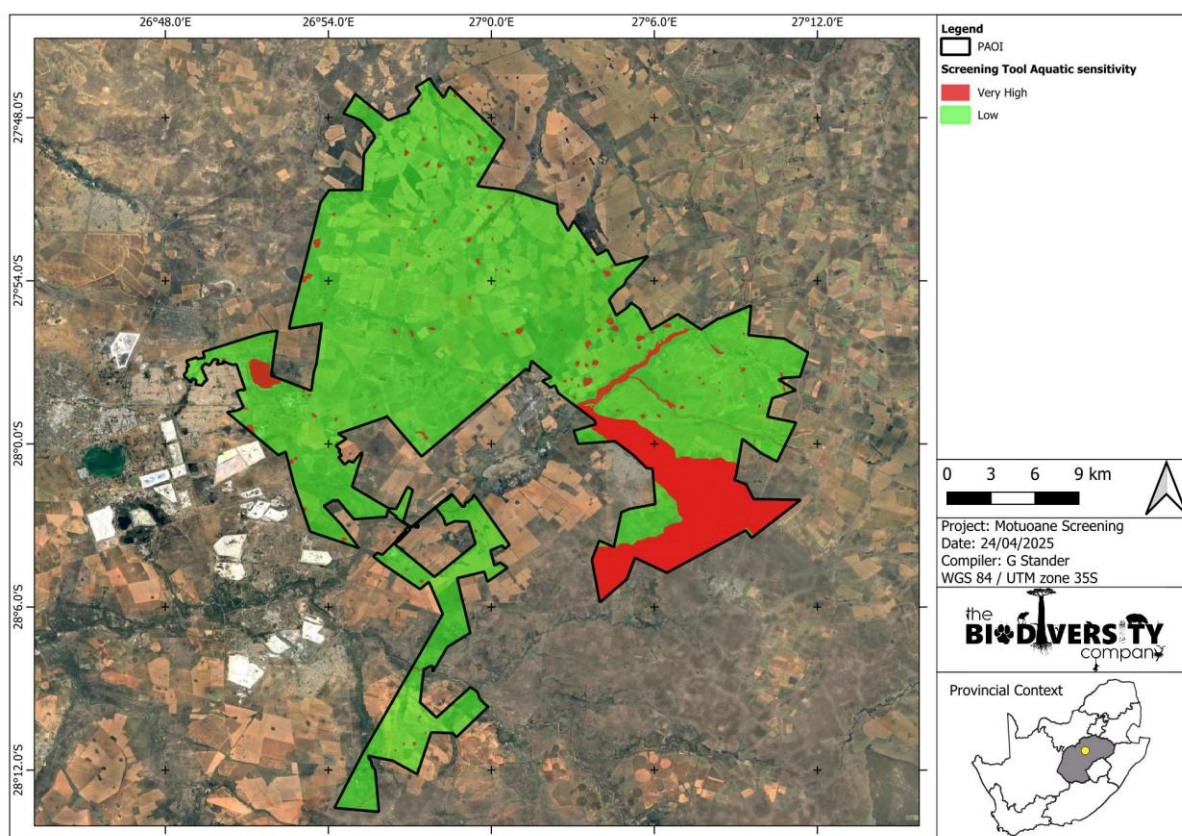


Figure 5-7 *The site sensitivity for the Aquatic biodiversity theme as per the DFFE Screening Tool*

Table 5-3 *Summary of the screening tool vs specialist assigned sensitivities in terms of Agriculture theme*

Screening Tool Theme	Screening Tool	Tool Validated or Disputed by Specialist - Reasoning
Agriculture Theme	High	Subject to confirmation during seasonal surveys.
	High	Subject to confirmation during seasonal surveys.
	High	Subject to confirmation during seasonal surveys.
	High	Subject to confirmation during seasonal surveys.
	High	Subject to confirmation during seasonal surveys.
	High	Subject to confirmation during seasonal surveys.
	Low	Subject to confirmation during seasonal surveys.
	Medium	Subject to confirmation during seasonal surveys.
	Very High	Subject to confirmation during seasonal surveys.

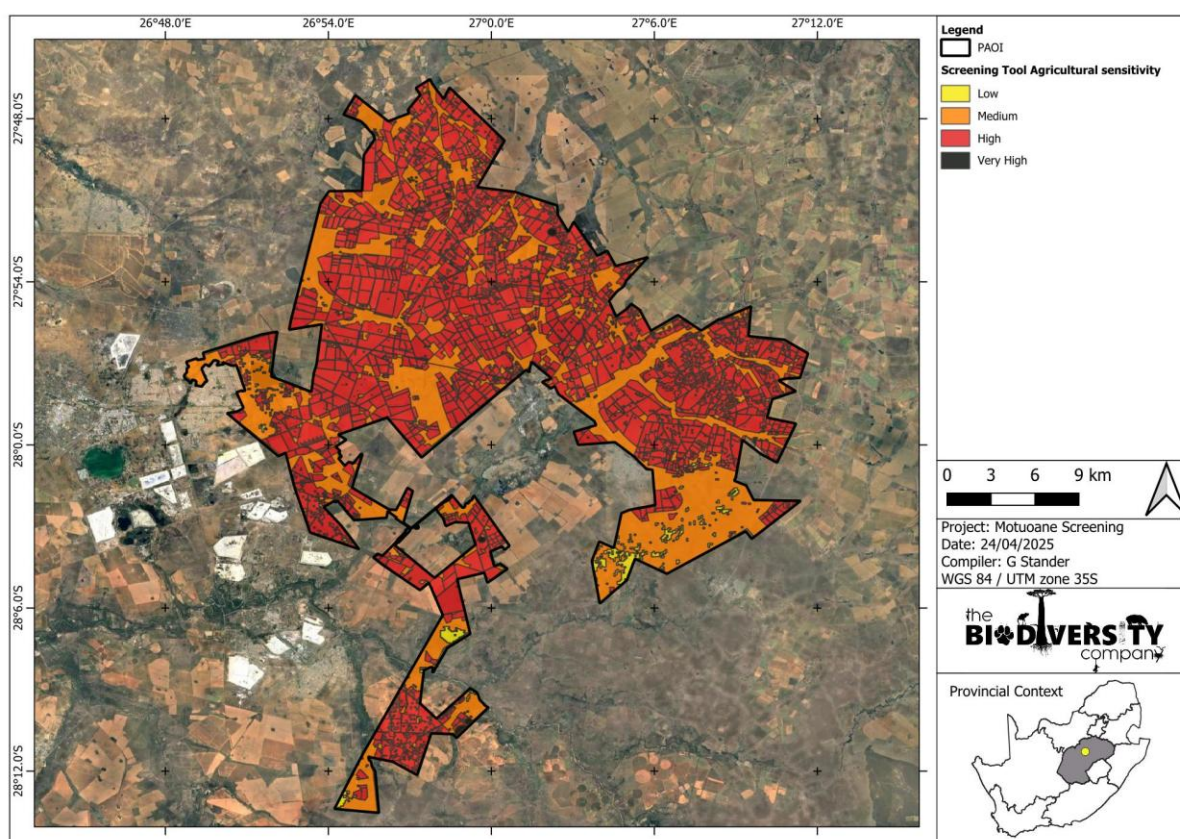


Figure 5-8 *The site sensitivity for the Agriculture theme as per the DFFE Screening Tool*

6 Impact Screening

6.1 Terrestrial Impact Assessment

Anthropogenic activities drive habitat destruction causing displacement of fauna and flora, and possibly direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites, and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area. See Table 6-1 for a summary of the identified impacts to terrestrial biodiversity.

Table 6-1 *Scoping evaluation table summarising the impacts identified to terrestrial biodiversity*

Impact Biodiversity loss/disturbance			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Destruction, fragmentation and degradation of habitats and ecosystems	<u>Direct impacts:</u>		
	» Disturbance / degradation / loss to vegetation and habitats		
	» Ecological corridors are disrupted		
	» Habitat fragmentation	Regional	None identified at this stage
	<u>Indirect impacts:</u>		
	» Erosion risk increases		
	» Fire risk increases		
	» Increase in invasive alien species		
Spread and/or establishment of alien and/or invasive species	<u>Direct impacts:</u>		
	» Loss of vegetation and habitat due to increase in alien species		
	<u>Indirect impacts:</u>		
	» Creation of infrastructure suitable for breeding activities of alien and/or invasive species	Regional	None identified at this stage
	» Spreading of potentially dangerous diseases due to invasive and pest species		
Direct mortality of fauna	<u>Direct impacts:</u>		
	» Loss of SCC species		
	» Loss of fauna diversity		
	<u>Indirect impacts:</u>	Regional	None identified at this stage
	» Loss of diversity and species composition in the area.		
	» Possible impact on the food chain		
Reduced dispersal/migration of fauna	<u>Direct impacts:</u>		
	» Loss of genetic diversity		
	» Isolation of species and groups leading to inbreeding		
	<u>Indirect impacts:</u>	Regional/National	None identified at this stage
	» Reduced seed dispersal		
	» Loss of ecosystem services		
Environmental pollution due to water runoff, spills from vehicles and erosion	<u>Direct impacts:</u>		
	» Pollution in watercourses and the surrounding environment		
	» Faunal mortality (direct and indirectly)	Regional	None identified at this stage
	<u>Indirect impacts:</u>		
	» Ground water pollution		
	» Loss of ecosystem services		
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.	<u>Direct impacts:</u>		
	» Disruption/alteration of ecological life cycles due to noise	Regional	None identified at this stage
	» Reduced pollination and growth of vegetation due to dust		

	» Faunal mortality due to light pollution (nocturnal species becoming more visible to predators) » Heat radiation could lead to the displacement of species <u>Indirect impacts:</u> » Loss of ecosystem services		
Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	<u>Direct impacts:</u> » Loss of SCCs or TOPS species <u>Indirect impacts:</u> » Loss of ecosystem service » Loss of genetic diversity	Regional	None identified at this stage

Description of expected significance of impact

The development of the area could result in the loss or degradation of the habitat and vegetation, most of which is assumed to be in a natural condition and supports a number of fauna species. The construction of the proposed development could also lead to the displacement/mortalities of the fauna and more specifically possible SCC fauna species. The proposed development could result in the disruption of ecological life cycles. This could be as a result of a number of things, but mainly due to dust, noise and light pollution. The disturbance of the soil/vegetation layer will allow for the establishment of flora alien invasive species, the new infrastructure in turn will provide refuge for invasive/feral fauna species. Erosion is another possible impact that could result from the disturbance of the topsoil and vegetation cover. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota.

Gaps in knowledge & recommendations for further study

- » This is completed at a desktop level only.
- » Identification and descriptions of habitats.
- » Identification of the Site Ecological Importance.
- » Location and identification of SCCs as well as in the case of fauna their location of the dens.
- » Determine a suitable buffer width for the identified features.

Recommendations with regards to general field surveys

- » Fieldwork should be undertaken during the wet season.

6.2 Avifauna Impact Assessment

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

Portions of the Project Area are classified as CBA1 CBA 2 and ESA 1 ESA 2. The importance of these areas is highlighted by the number of avifauna SCCs expected. A total of 21 avifauna SCCs could occur within the Project Area.

Table 6-2 Scoping evaluation table summarising the impacts identified to avifauna ecology

Issue	Impact Biodiversity loss/disturbance		
	Nature of Impact	Extent of Impact	No-Go Areas
Destruction, fragmentation and degradation of habitats and ecosystems	<u>Direct impacts:</u> Disturbance / degradation / loss to vegetation and habitats		
	Ecological corridors are disrupted Habitat fragmentation	Local	None identified at this stage
	<u>Indirect impacts:</u> Erosion risk increases Fire risk increases Increase in invasive alien species		
	<u>Direct impacts:</u> » Loss of vegetation and habitat due to increase in alien species	Local	None identified at this stage

	<u>Indirect impacts:</u> » Creation of infrastructure suitable for breeding activities of alien and/or invasive species » Spreading of potentially dangerous diseases due to invasive and pest species		
Direct mortality of avifauna	<u>Direct impacts:</u> » Loss of SCC species » Loss of avifauna diversity <u>Indirect impacts:</u> » Loss of diversity and species composition in the area. » Possible impact on the food chain	Regional	None identified at this stage
Reduced dispersal/migration of avifauna	<u>Direct impacts:</u> » Loss of genetic diversity » Isolation of species and groups leading to inbreeding <u>Indirect impacts:</u> » Reduced seed dispersal » Loss of ecosystem services	Regional	None identified at this stage
Environmental pollution due to water runoff, spills from vehicles and erosion	<u>Direct impacts:</u> » Pollution in watercourses and the surrounding environment » Avifaunal mortality (direct and indirectly) <u>Indirect impacts:</u> » Ground water pollution » Loss of ecosystem services	Local	None identified at this stage
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust, heat radiation and light pollution.	<u>Direct impacts:</u> » Disruption/alteration of ecological life cycles due to noise » Reduced pollination and growth of vegetation due to dust leading to reduced habitat » Avifaunal mortality due to light pollution (nocturnal species becoming more visible to predators) » Heat radiation could lead to the displacement of species <u>Indirect impacts:</u> » Loss of ecosystem services	Local	None identified at this stage
Staff and others interacting directly with fauna (potentially dangerous) or poaching of animals	<u>Direct impacts:</u> » Loss of SCCs or TOPS species <u>Indirect impacts:</u> » Loss of ecosystem service » Loss of genetic diversity	Local	None identified at this stage

Description of expected significance of impact

The development of the area could result in the loss or degradation of the habitat and vegetation, most of which is still in a natural condition and supports a number of avifauna species. The prospecting activities could also lead to the displacement/mortalities of the avifauna and more specifically SCC avifauna species. The proposed development could result in the disruption of ecological life cycles. This could be as a result of a number of things, but mainly due to dust, noise, light pollution and heat radiation. Leaks, spillages or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota.

Gaps in knowledge & recommendations for further study

- This is completed at a desktop level only.
- Identification and descriptions of habitats.
- Identification of the Site Ecological Importance after dual season surveys.
- Location and identification of SCCs as well as in the case of avifauna their location of the nests.
- Determine a suitable buffer width for the identified features.

Recommendations with regards to general field surveys

- Field surveys to prioritise the development areas, but also consider the 500 m PAOI.
- Fieldwork to be undertaken during the wet season period (October to April).
- Avifauna assessment field work to be conducted over two surveys (one in the wet season, the other in any season) to ensure migratory species are considered.
- Breeding survey to be conducted in late spring– early summer.

6.3 Freshwater Impact Assessment

The following potential main impacts on the water resources were considered for the construction phase of the proposed project. Construction could result in the encroachment into water resources and result in the loss or degradation of these systems, most of which are functional and provide ecological services. Water resources are also likely to be traversed by roads and other linear infrastructure which might create a barrier to flow and biotic movement across the systems. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. The prospecting will expose and mobilise earth materials which could result in sedimentation of the receiving systems. Several machines, vehicles and equipment will be required for the phase, aided by chemicals and concrete mixes for the project. Leaks, spillages, or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to influence the associated biota. The following potential impacts during site clearing and preparation were considered:

- Water resource disturbance / loss.
 - Direct disturbance / degradation / loss to soils or vegetation due to the construction of the facility and associated infrastructure; and
- Water runoff from construction site;
 - Increased erosion and sedimentation; and
 - Contamination of receiving water resources.

During the operational phase an increase in stormwater runoff is anticipated due to the hardened surfaces, resulting in an increase in run-off volume and velocities due to the altered flow regimes. The changes could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems. The reporting of surface run-off to the systems could also result in the contamination of the systems, transporting (in addition to sediment) diesel, hydrocarbons and soil from the operational areas. The following potential impacts were considered:

- Hardened surfaces;
 - Potential for increased stormwater runoff, leading to increased erosion and sedimentation; and
- Contamination;
 - Potential for increased contaminants entering the wetland systems.

See Table 6-3 for the identified impacts relating to wetlands within the PAOI.

Table 6-3 *Scoping evaluation table summarising the impacts identified to freshwater ecology*

Impact			
Water resource disturbance / loss			
Issue	Nature of Impact	Extent of Impact	No-Go Areas
Disturbance / degradation / loss to wetland soils or vegetation due to the construction of the facility and associated infrastructure, such as crossings	<u>Direct impacts:</u>		
	» Disturbance / degradation / loss to wetland soils or vegetation	Regional	None identified at this stage
	<u>Indirect impacts:</u>		
	» Loss of ecosystem services		
Increased erosion and sedimentation & contamination of resources	<u>Direct impacts:</u>		
	» Erosion and structural changes to the systems	Regional	None identified at this stage
	<u>Indirect impacts:</u>		

-
- » Sedimentation & contamination of downstream reaches
-

Description of expected significance of impact

The development of the area could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. Water resources are also likely to be traversed by roads and other linear infrastructure which might create a barrier to flow and biotic movement across the systems. These disturbances could also result in the infestation and establishment of alien vegetation would affect the functioning of the systems. Earthworks will expose and mobilise earth materials which could result in sedimentation of the receiving systems. A number of machines, vehicles and equipment will be required, aided by chemicals and concrete mixes for the project. Leaks, spillages or breakages from any of these could result in contamination of the receiving water resources. Contaminated water resources are likely to have an effect on the associated biota. It is anticipated to increase stormwater runoff due to the hardened surfaces and the crossings will result in an increase in run-off volume and velocities, resulted in altered flow regimes. The changes could result in physical changes to the receiving systems caused by erosion, run-off and also sedimentation, and the functional changes could result in changes to the vegetative structure of the systems. The reporting of surface run-off to the systems could also result in the contamination of the systems, transporting (in addition to sediment) diesel, hydrocarbons and soil from the operational areas.

Gaps in knowledge & recommendations for further study

- » This is completed at a desktop level only.
- » Identification, delineation and characterisation of water resources.
- » Undertake a functional assessment of systems where applicable.
- » Determine a suitable buffer width for the resources.

Recommendations with regards to general field surveys

- » Field surveys to prioritise the development areas but also consider the 500 m regulation area.
-

6.4 Soil Impact Assessment

Various soil forms could exist on site however, they will need to be confirmed and classified following a site visit. It is predicted that the soils found on site will have a very low, low moderate to moderate land capabilities. Even though the soil depth, texture and permeability of these soil types ensure at least moderate land capability, the climatic capability of an area often reduces the land potential (Table 6-4).

Table 6-4 *Scoping evaluation table summarising the impacts identified to soils.*

Impact Loss of land capability			
Issue	Nature of Impact	Extent of Impact	Exclusion Areas
Compaction/soil stripping/transformation of land	<u>Direct impacts:</u>		
	» Loss of soil		
	» Destruction of soil structure	Local	None identified at this stage
	» Poor drainage		
	<u>Indirect impacts:</u>		
	» Loss of land capability		
Erosion	<u>Direct impacts:</u>		
	» Loss of topsoil	Site/Local	None identified at this stage
	» Reduced water holding capacity		
	<u>Indirect impacts:</u>		
	» Loss of land capability		

Description of expected significance of impact

The disturbances resulting from drilling and seismic surveys can lead to the invasion and establishment of alien plant species, which can have detrimental impact soil resources. Earthworks may expose and mobilize soil materials, potentially causing compaction and/or erosion. The project will require numerous machines, vehicles, and equipment, along with the use of chemicals and concrete mixes. Any leaks, spills, or breakages from these could contaminate soil resources, affecting the soil's salinity or pH levels, and potentially reducing

its fertility and ability to provide nutrition to plants. During the operational phase, impacts associated with the proposed development can be effectively managed through best "housekeeping" practices. The significance of these impacts will be assessed following a field evaluation.

Gaps in knowledge & recommendations for further study

- » This is completed at a desktop level with supporting fieldwork and baseline findings.
- » The GPS used for delineations is accurate to within five meters. Therefore, the delineation plotted digitally may be offset by at least five meters to either side.

Recommendations with regards to general field surveys

- » None.
-

7 Conclusion

7.1 Terrestrial Ecology

The PAOI overlaps with the CBA 1, CBA 2, ESA 1, ESA 2 according to the Free State Biodiversity Spatial Plan CBA map. Moreover, the PAOI also overlaps with two (2) SAPAD (Thabong Game Ranch and Tara Wildlife Safaris) areas, an Endangered vegetation type (Vaal-Vet Sandy Grassland) as well as NPAES Priority Focus Areas. According to the Mining and Biodiversity Guidelines the project area overlaps with highest biodiversity importance, correlating to the highest risk for mining. No sensitive flora species are listed as likely to occur in the PAOI, however, one (1) reptile species and two (2) mammal species are likely to occur.

The expectant anthropogenic activities are likely to drive habitat destruction causing displacement of fauna and flora and possibly even direct mortality. Land clearing destroys local wildlife habitat and can lead to the loss of local breeding grounds, nesting sites, and wildlife movement corridors such as rivers, streams and drainage lines, or other locally important features. The removal of natural vegetation may reduce the habitat available for fauna species and may reduce animal populations and species compositions within the area. Prospecting activities may also lead to pollution in terms of noise, air (dustfall), and light.

It is the specialist's opinion that the proposed developability within the PAOI is as follows:

- Avoidance mitigation (Very High SEI Areas): 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).
- Minimisation and restoration mitigation (Low SEI Areas): Any development activities of medium to high impact acceptable followed by appropriate restoration activities.
- A site visit and a full assessment in the correct flowering season must be conducted by a suitably qualified ecologist, before commencement of construction, in order to ensure the presence of all potential SCC or protected fauna and flora on site. Any individual of any protected plant species that are present needs a relocation or destruction permit in order to be removed or destroyed due to the development.

7.2 Avifauna

Portions of the PAOI are classified as CBA1, CBA 2, ESA 1 and ESA 2. Moreover, the PAOI overlaps with a Protected Area (Thabong Game Reserve and Tara Wildlife Safaris). Three CWAC sites are within 10 km of PAOI, and three CAR routes fall within the PAOI.

Based on SABAP2 data, 298 avifauna species could occur within the PAOI, of which twenty-one (21) are threatened. Moreover, two high sensitivity and one medium-high sensitivity species are listed by the DFFE screening tool.

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

7.3 Freshwater Ecology

A key consideration for the impact assessment is the presence of the water resources in proximity to the PAOI. The available data suggests the presence of wetlands within the PAOI, as well as wetlands and a river within the 500 m regulated area.

Construction could result in the encroachment into water resources and result in the loss or degradation of these system, most of which are functional and provide ecological services. These disturbances could also result in the infestation and establishment of alien vegetation which would affect the functioning of the systems. Leaks and/or spillages could result in contamination of the receiving water resources. Contaminated water resources are likely to influence the associated biota. An increase in stormwater runoff could result in physical changes to the receiving systems caused by erosion, run-off and sedimentation, and the functional changes could result in changes to the vegetative structure of the systems.

A Freshwater specialist should be consulted for the delineation of wetlands identified within the PAOI as well as suitable mitigations and recommendations.

7.4 Land Capability/Soils

The land capability sensitivity (DAFF, 2017) is dominated by land capabilities with “Low Moderate to Moderate”, with isolated areas associated with “Very Low to Low” as well as “Moderate to Moderate-High” sensitivity. The field crop boundaries were also identified following the agricultural theme screening tool. The overall site sensitivity of the PAOI ranges from Very Low -Low to Moderate – High. If the crop fields found within the PAOI are active, the prospecting activities will have an overall high residual impact on the agricultural production ability of the land. However, if the crop fields within the PAOI are inactive, the prospecting activities will have an overall low to medium residual impact on the agricultural production ability of the land. The state of the crop fields as well as the soils present within the PAOI will need to be confirmed following a site visit.

An Agricultural specialist should be consulted for the identification and classification of soils within the PAOI as well as suitable mitigation and recommendations.

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9 Appendix Items

9.1 Appendix A – Specialist Declaration of Independence

I, Julia Elliott, 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 ⁱⁿterms of Section 24F of the Act.



Julia Elliott

Biodiversity Specialist

The Biodiversity Company

February 2025

I, Grietjie Stander, 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.



Grietjie Stander

Biodiversity Specialist

The Biodiversity Company

February 2025

I, Carami Burger, 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.

CBurger

Carami Burger

Terrestrial Ecologist

The Biodiversity Company

February 2025

I, Masilabela Seepamore, 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.



Masilabela Seepamore

Soil Ecologist

The Biodiversity Company

February 2025

I, Divan Van Rooyen, 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.



Divan Van Rooyen

Avifauna Ecologist

The Biodiversity Company

Freshwater Ecologist

9.2 Appendix B – Specialist CVs

Julia Elliott

*BSc Honours – Biodiversity and Ecology
(Cand Nat Sci)*

Cell: +27 64 854 5834

Email: julia@thebiodiversitycompany.com

Identity Number: 9906010091089

Date of birth: 1 June 1999



Profile Summary	Key Experience	Nationality
Work experience throughout South Africa.	<ul style="list-style-type: none"> Vegetation Assessments Fire management plans Pesticide management plans Water management plans Monitoring programmes Field work and research 	South African
Experience with wildlife management and ecological monitoring in Hluhluwe-iMfolozi Game Park and surrounding game reserves.		Languages
		English – Proficient Afrikaans – Conversational
Areas of Interest	Country Experience	Qualifications
Sustainability and Conservation.	South Africa	<ul style="list-style-type: none"> BSc Honours Biodiversity and Ecology BSc Biodiversity and Ecology SACNASP (Cand. Nat. Sci. 169961)
Green Finance.	Costa Rica	
Renewable Energy & Mining.		
Landscape rehabilitation.		
Research publication with a conservation influence.		
Botany and Zoology.		

CURRICULUM VITAE: Grietjie Stander



Grietjie Stander

M.Sc. – Zoology

(Certified Natural Scientist)

Cell: +27 64 901 17 24

Email: grietjie@thebiodiversitycompany.com

Identity Number: 9309140150083

Date of birth: 14 September 1993



Profile Summary

Working experience in South Africa, Mozambique, Angola and Mauritius.

Experience with infrastructure development, road development, renewable energy, mining, and prospecting.

Specialist expertise include terrestrial ecology and wetland delineation.

Areas of Interest

Ornithology, Zoology, Biodiversity and Conservation.

Research publication with a conservation influence.

Renewable Energy & Mining, Farming and Sustainability

Key Experience

- Terrestrial Ecological Assessments
- Wetland Delineation and Ecological Assessments
- Invasive Species Plans
- Water Use License Applications

Countries worked in

South Africa
Mozambique
Mauritius
Angola

Nationality

South African

Languages

English – Proficient
Afrikaans – Proficient

Qualifications and Courses

- MSc Zoology
- BSc Hons Environmental Sciences (Aquatic Health)
- BSc Zoology and Geography
- WetRest (2023) – Wetland Introduction and Delineation course
- Africa Land – Use Training (2024) – Grass Identification and Veld Management
- Cert Sci Nat (162039)

Carami Burger

B.Sc. Honours – Ecological Interactions and
Ecosystem Resilience (Cum Laude)

(Pr Sci Nat)

Cell: +27 83 630 9077

Email: Carami@thebiodiversitycompany.com

Identity Number: 9606250185084

Date of birth: 25 June 1996



Profile Summary

Working experience in South Africa, Mozambique, Zambia, Angola, Sierra Leone and Botswana.

Specialist experience with infrastructure development, road development, renewable energy, mining and prospecting.

Specialist expertise include terrestrial ecology, wetland resources, rehabilitation and management plans, environmental compliance and monitoring.

Areas of Interest

Renewable Energy & Bulk Services Infrastructure Development, Mining, Farming, Sustainability and Conservation.

Key Experience

- Environmental Impact Assessments (EIA)
- Basic Assessments
- Terrestrial Ecological Assessments
- Wetland Delineation and Ecological Assessments
- Environmental Management Programmes (EMPr)
- Rehabilitation Plans
- Invasive Species Plans
- Search and Rescue Plans
- Environmental Compliance Audits
- Water Use License Applications
- Dust Fallout Monitoring
- Water Quality Monitoring

Countries worked in

South Africa
Mozambique
Zambia
Angola
Sierra Leone
Botswana

Nationality

South African

Languages

English – Proficient
Afrikaans – Proficient

Qualifications

- BSc Hons Ecological Interactions and Ecosystem Resilience.
- BSc Botany and Zoology.
- Pr Sci Nat (121757)

Masilabela Klaas Seepamore

MSc Soil Science *Cum Laude* (Pr Sci Nat)

Cell: +27 788151878

Email: masilabela@thebiodiversitycompany.com

Identity Number: 8806085781088

Date of birth: 08 June 1988



Profile Summary

Working experience in South Africa

Specialist experience with soil science, agronomy and agrometeorology.

Specialist expertise include production agronomy, Soil classification, fertilizer recommendation, Input planning, trial management, data analysis and crop modelling.

Areas of Interest

Farming, resource use efficiency production agronomy, soil classification, soil and crop research, climate change adaptation and mitigation strategies,

Key Experience

- Land suitability studies and report writing
- Soil taxonomic classification SA forms
- Fertilizer recommendation
- Crop research
- Data analysis
- Environmental Impact Assessment (EIA)
- Environmental Management Programme (EMP)
- Agricultural potential assessment

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient

Setswana, Sesotho – Proficient

Qualifications

- BASOS-FACTS Course (FERTASA)
- MSc Agriculture *Cum laude* (University of the Free State) – Soil Science (soil science, agronomy, and production agronomy)
- BSc Agriculture Honours (University of the Free State) – Soil Science (soil science, agronomy, crop nutrition)
- BSc Agricultural Agronomy and Soil Science
- Pr Sci Nat 113907

Divan van Rooyen

Ph.D. Environmental Science

Pri Sci Nat (151272)

Cell: +27 83 265 8776

Email: divan@thebiodiversitycompany.com

Identity Number: 9312205072085

Date of birth: 20 December 1993



Profile Summary

Working experience throughout Southern Africa

Specialist experience with mining, WWTW's and construction.

Specialist expertise include wetlands resources, aquatic ecology and ecotoxicology.

Areas of Interest

Mining, Seismic Surveys, Renewable Energy, Bulk Services Infrastructure Development & WWTW's.

Key Experience

- Environmental Impact Assessments (EIA)
- Environmental Management Programmes (EMP)
- Wetland delineations and ecological assessments
- Rehabilitation Plans and Monitoring
- Aquatic biomonitoring

Country Experience

South Africa

Nationality

South African

Languages

English – Proficient

Afrikaans – Proficient

Qualifications

- PhD (North-West University of Potchefstroom) – Environmental Science with Aquatic Ecosystem Health
- MSc (North-West University of Potchefstroom) – Environmental Science (Ecological Remediation and Sustainable Management)
- BSc Honours (North-West University of Potchefstroom) – Environmental Science with Ecological Remediation and Sustainable Management
- BSc Environmental sciences
- Pri Sci Nat (151272)