APPENDIX E4 – Terrestrial Biodiversity Assessment



SCIENTIFIC TERRESTRIAL SERVICES

Terrestrial Biodiversity Assessment

AS PART OF THE ENVIRONMENTAL AUTHORISATION PROCESS FOR THE PROPOSED MABASA 750 MEGAWATT (MW) COMBINED CYCLE GAS TURBINE (CCGT) POWER PLANT IN RICHARDS BAY, IN THE KWAZULU–NATAL PROVINCE.

Part A: Background Information and Site Sensitivity Verification

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Part of the SAS Environmental Group of Companies

EXECUTIVE SUMMARY

Scientific Terrestrial Services (Pty) Ltd. (STS) was appointed to undertake a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) application process for the proposed Mabasa 750-megawatt (MW) Combined Cycle Gas Turbine (CCGT) power plant in Richards Bay, KwaZulu-Natal Province. The proposed development area is hereafter referred to as the "study area".

The study area is located within the uMhlathuze Local Municipality, which falls under the King Cetshwayo District Municipality in KwaZulu-Natal Province. More specifically, the study area is situated within the Richards Bay Industrial Development Zone (IDZ), approximately 2 kilometres (km) north-west of central Richards Bay.

The proposed Mabasa Project comprises a 750 MW gas-fired CCGT power plant and associated infrastructure. The plant will be based on a "2+2+1" configuration, comprising two General Electric Frame gas turbines, each with a dedicated Heat Recovery Steam Generator, and a shared steam turbine. Associated infrastructure will include, inter alia, a 275 kilovolt (kV) switchyard, cooling infrastructure, internal access roads, a control room, office and support buildings, fire protection infrastructure, and associated balance-of-plant components.

The land area required for the proposed project is approximately 13 hectares (ha). The plant layout remains conceptual and will be refined following completion of the relevant technical and environmental investigations. Given the scale of the proposed infrastructure relative to the extent of the study area, this assessment considers the impacts associated with the transformation of the study area for the development of the proposed CCGT facility and its associated infrastructure.

DESKTOP ASSESSMENT RESULTS

According to Mucina and Rutherford (2006) and the National Vegetation Map (SANBI, 2018a), the study area is located within the Indian Ocean Coastal Belt Bioregion and is associated with the Maputaland Wooded Grassland vegetation type. This ecosystem is classified as Endangered (EN), with significant historical transformation due to plantation forestry, agriculture, and urban development, and ongoing pressures from alien invasive species.

The Red List of Ecosystems (2022) confirms the threatened status of this vegetation type, noting continued habitat loss and degradation across its range. At a provincial scale, the KwaZulu-Natal Systematic Conservation Plan (KZNSCP) identifies the study area as comprising both Maputaland Wooded Grassland (EN) and Subtropical Freshwater Wetlands (Vulnerable, VU), with the entire study area classified as a Critical Biodiversity Area (CBA) Irreplaceable, indicating its importance for meeting biodiversity targets.

The study area is located within a National Protected Area Expansion Strategy (NPAES) Priority Focus Area and occurs within proximity to protected areas such as the Enseleni Nature Reserve (~5 km north) and the Richards Bay Game Reserve (~6 km south). It also falls within the Electricity Grid Infrastructure (EGI) East Expansion Strategic Transmission Corridor, while no Strategic Water Source Areas (SWSAs) are present in the vicinity.

HABITAT AND SPECIES SUMMARIES

The floral communities identified during the site assessment (13th June 2024) are described under four (4) broad[1] habitat units. The three broad habitat units were delineated based on vegetation structure and the dominant plant groups observed within the vegetation communities, as well as on habitat integrity and the ecological processes the habitats provide or support. The delineated habitat units thus include the Transformed Habitat, Hygrophilous Grassland[1], Thicket Vegetation, and Freshwater-Associated Habitat[2], as described below:

[1] Broad habitat categories have been delineated and provide an indication of the main vegetation types associated with the mining right area.

- **The Transformed Habitat** is highly disturbed, structurally simplified, and of very low Site Ecological Importance (SEI), with negligible potential to support protected or threatened flora;
- **The Hygrophilous Grassland Habitat**[2], associated with low-lying, moisture-influenced areas, is of low SEI and, although no protected species were recorded, retains some suitable habitat for several provincially protected species and a medium probability of occurrence (POC) for *Senecio ngoyanus* (VU); and
- **The Thicket Vegetation Habitat**, characterised by a more dense woody component and greater structural complexity, is of medium SEI and represents an important habitat for flora of conservation concern, with several protected species and threatened taxa (including *Cassipourea gummiflua* var. *verticillata* (VU) and *Emplectanthus cordatus* (VU)) which have a possibility of occurrence within the habitat; and
- **The Freshwater-Associated Habitat**[3], comprising wetland features such as seep and wetland flat systems, is of high SEI and represents the most sensitive floral habitat on site, with a high likelihood of supporting protected species such as *Disa woodii* and a moderate to high probability of occurrence for threatened species including *Fimbristylis aphylla* (VU), *Senecio ngoyanus* (VU), and *Thesium polygaloides* (VU).

Overall, while the study area retains elements of the EN ecosystem, the vegetation is degraded and exhibits only limited affinity to the reference condition. No threatened plant species were confirmed during the assessment; however, several species of conservation concern (SCC), including provincially protected species, may occur within suitable habitat.

From a faunal ecological and resource management perspective, the Transformed habitat obtained a **very low** SEI, the Hygrophilous Grassland Habitat and Thicket Vegetation Habitat are of **medium** SEI**,** and the Freshwater-Associated Habitat is of **high** SEI. The study area has experienced several anthropogenic impacts over time where portions of the site had previously been transformed or degraded. Current fragmentation in the larger landscape restricts immigration and emigration for most terrestrial faunal species and has reduced the overall faunal species diversity. These activities have degraded the habitat. As a result, common faunal classes, that are more resilient to disturbance, are anticipated to occur within the study area in intermediate abundances. However there exists focal points around the study site that contain resources that are able to support certain SCC.

IMPACT ASSESSMENT

The proposed Mabasa CCGT development will result in the near-complete transformation of the study area (~13 ha), including all identified habitat units. Given the infrastructure requirements, avoidance of ecological features is not considered feasible, and the assessment therefore focuses on the minimisation and management of impacts.

From a biodiversity perspective, the primary impacts relate to the loss of degraded habitat with limited affinity to the EN Maputaland Wooded Grassland ecosystem. Although portions of the site are mapped within a CBA, no CBA habitat has been confirmed within the terrestrial components of the study area, as these designations are primarily associated with freshwater features.

It is noted that freshwater habitats within the study area have been authorised for infilling under a separate Environmental Authorisation and are therefore excluded from the current impact assessment. Impacts are lowest within the Transformed Habitat, increases through the Hygrophilous Grassland, and are highest within Thicket Vegetation due to its higher structural complexity and potential to support SCC. Although no threatened plant species were recorded during the field assessment, the presence of suitable habitat means that impacts to protected and potentially occurring threatened species cannot be excluded.

A precautionary mitigation approach has therefore been adopted, including pre-construction walkdowns, permitting, and search, rescue, and relocation measures where required. Indirect impacts such as edge effects and AIP proliferation are expected to be localised and manageable through implementation of mitigation measures.

[2] Vegetation associated with damp or seasonally saturated conditions.
[3] Wetland and seepage-related habitat associated with hydromorphic soils and hydrophilic vegetation.

Post-mitigation, impacts remain unavoidable at a site level due to the complete transformation of habitat; however, these are reduced to low significance, and are considered acceptable within the broader landscape context, which is already substantially transformed and fragmented.

From a faunal perspective, the anticipated risks to faunal systems are considered **medium-low post mitigation** (given all mitigation measures are implemented). The most significant impacts to faunal communities and ecology (i.e., habitat, diversity, SCC) are anticipated during the construction phase in the Hygrophilous Grassland Habitat. The impact of the proposed activities and infrastructure is not anticipated to be a highly signficant impact to faunal biodiversity.

During the site visit no faunal SCC listed under the Online National Web Based Environmental Screening Tool and IUCN were confirmed within the study area; though the study area does provide suitable habitat for potential faunal SCC. Three (3) other faunal SCC have a high POC for the study area; *Hemisus guttatus* (Spotted Snout-Burrower, NT), *Hemicordulia Africana* (African Emerald, VU) and *Agriocnemis gratiosa* (Gracious Wisp, NT); whilst four (4) SCCs have a medium POC - which may potentially be encountered within the study area. It is noted that these species are not likely dependent on the study area for survival, and the area may only be a part of their larger home ranges or foraging areas. Provided that mitigation measures are implemented, the overall impact to faunal SCC as a result of the construction and operation activities is not likely to significantly impact SCC populations in the region.

Reasoned Opinion:

It is the opinion of the specialists that the risks associated with the proposed development can be reduced to acceptable levels, taking into account the degraded nature of the site, the limited extent of remaining natural terrestrial habitat, and the implementation of the recommended mitigation measures. While the development will result in the loss of local vegetation and associated ecological function, these impacts are considered of low significance at a landscape scale and are unlikely to compromise the long-term persistence of the Maputaland Wooded Grassland ecosystem.

Accordingly, the proposed development is not considered to present an unacceptable biodiversity risk or impact and - provided that mitigation measures are implemented and good housekeeping maintained - should be considered favourably by the competent authority for EA.

DOCUMENT GUIDE

The table below provides a guide to the reporting of biodiversity impacts as they relate to Government Notice No. 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on **Terrestrial Biodiversity** as published in Government Gazette 43110 dated 20 June 2020.

Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
No.	**SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS**	**Section in report/Notes**
2	**Terrestrial Biodiversity Specialist Assessment**	
2.1	The assessment must be prepared by a specialist registered with the South African Council for Natural Scientific Professionals (SACNASP) with expertise in the field of terrestrial biodiversity.	**Part A – C:** Cover Page **Part A:** Appendix E
2.2	The assessment must be undertaken on the preferred site and within the proposed development footprint.	**Part A**: Section 1
2.3	**The assessment must provide a baseline description of the site which includes, as a minimum, the following aspects:**	
2.3.1	A description of the ecological drivers or processes of the system and how the proposed development will impact these;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.2	Ecological functioning and ecological processes (e.g., fire, migration, pollination, etc.) that operate within the preferred site;	**Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.3	The ecological corridors that the proposed development would impede including migration and movement of flora and fauna;	**Part A:** Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.4	The description of any significant terrestrial landscape features (including rare or important flora-faunal associations, presence of Strategic Water Source Areas (SWSAs) or Freshwater Ecosystem Priority Area (FEPA) sub catchments;	**Part A:** Section 3 (desktop analysis) **None associated with the study area.**
2.3.5	A description of terrestrial biodiversity and ecosystems on the preferred site, including: a) main vegetation types; b) threatened ecosystems, including listed ecosystems as well as locally important habitat types identified; c) ecological connectivity, habitat fragmentation, ecological processes, and fine scale habitats; and d) species, distribution, important habitats (e.g., feeding grounds, nesting sites, etc.) and movement patterns identified;	**Part A**: Section 3 (desktop analysis) **Part B**: Section 3 (flora) **Part C:** Section 3 (fauna)
2.3.6	The assessment must identify any alternative development footprints within the preferred site which would be of a "low" sensitivity as identified by the screening tool and verified through the site sensitivity verification; and	**Part B**: Section 4 (flora) **Part C:** Section 4 (fauna)
2.3.7	**The assessment must be based on the results of a site inspection undertaken on the preferred site and must identify:**	
2.3.7.1	Terrestrial Critical Biodiversity Areas (CBAs), including: *a) the reasons why an area has been identified as a CBA;* *b) an indication of whether or not the proposed development is consistent with maintaining the CBA in a natural or near natural state or in achieving the goal of rehabilitation;* *c) the impact on species composition and structure of vegetation with an indication of the extent of clearing activities in proportion to the remaining extent of the ecosystem type(s);* *d) the impact on ecosystem threat status;* *e) the impact on explicit subtypes in the vegetation;* *f) the impact on overall species and ecosystem diversity of the site; and*	**Part A**: Section 3 (desktop analysis) **Part B**: Section 3 **Part C:** Section 3

Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
No.	**SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS**	**Section in report/Notes**
	g) *the impact on any changes to threat status of populations of species of conservation concern in the CBA;*	
2.3.7.2	Terrestrial Ecological Support Areas (ESAs), including: *a) the impact on the ecological processes that operate within or across the site;* *b) the extent the proposed development will impact on the functionality of the ESA; and* c) *loss of ecological connectivity (on site, and in relation to the broader landscape) due to the degradation and severing of ecological corridors or introducing barriers that impede migration and movement of flora and fauna;*	
2.3.7.3	Protected areas as defined by the National Environmental Management: Protected Areas Act, 2004 including- *a) an opinion on whether the proposed development aligns with the objectives or purpose of the protected area and the zoning as per the protected area management plan;*	**Part A**: Section 3 (desktop analysis). **Part B**: Section 3
2.3.7.4	Priority areas for protected area expansion, including- *a) the way in which in which the proposed development will compromise or contribute to the expansion of the protected area network;*	**Part A**: Section 3 (desktop analysis).
2.3.7.5	SWSAs including: *a) the impact(s) on the terrestrial habitat of a SWSA; and* b) *the impacts of the proposed development on the SWSA water quality and quantity (e.g. describing potential increased runoff leading to increased sediment load in water courses);*	**Part A**: Section 3 (desktop analysis). **None associated with the study area.**
2.3.7.6	FEPA sub catchments, including- *a) the impacts of the proposed development on habitat condition and species in the FEPA sub catchment;*	Not part of the scope of this report.
2.3.7.7	Indigenous forests, including: *a) impact on the ecological integrity of the forest; and* b) *percentage of natural or near natural indigenous forest area lost and a statement on the implications in relation to the remaining areas.*	Not applicable. No forests associated with this project.
2.4	**The findings of the assessment must be written up in a Terrestrial Biodiversity Specialist Assessment Report.**	
	Part B: Results of the **Floral Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to floral communities. **Part C:** Results of the **Faunal Assessment** as well as conclusions on Terrestrial Biodiversity as it relates to faunal communities.	
3	**Terrestrial Biodiversity Specialist Assessment Report**	
3.1	**The Terrestrial Biodiversity Specialist Assessment Report must contain, as a minimum, the following information:**	
3.1.1	Contact details of the specialist, their SACNASP registration number, their field of expertise and a curriculum vitae;	**Part A:** Appendix E
3.1.2	A signed statement of independence by the specialist;	**Part A:** Appendix E
3.1.3	A statement on the duration, date and season of the site inspection and the relevance of the season to the outcome of the assessment;	**Part B:** Section 1 & 2 (flora) **Part C:** Section 1 (fauna)
3.1.4	A description of the methodology used to undertake the site verification and impact assessment and site inspection, including equipment and modelling used, where relevant;	**Part A:** Appendix D **Part B:** Section 2 (flora) & Appendix A (flora) **Part C:** Section 2 (fauna) & Appendix A (fauna)
3.1.5	A description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations;	**Part B:** Sections 1 & 2 (flora) **Part C:** Section 1 (fauna)

Theme-Specific Requirements as per Government Notice No. 320 Terrestrial Biodiversity Theme – Very High Sensitivity Rating as per Screening Tool Output		
No.	**SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS**	**Section in report/Notes**
3.1.6	A location of the areas not suitable for development, which are to be avoided during construction and operation (where relevant);	**Part B:** Section 4 (flora) **Part C:** Section 4 (fauna)
	Impact Assessment Requirements 3.1.7 Additional environmental impacts expected from the proposed development; 3.1.8 Any direct, indirect and cumulative impacts of the proposed development; 3.1.9 The degree to which impacts and risks can be mitigated; 3.1.10 The degree to which the impacts and risks can be reversed; 3.1.11 The degree to which the impacts and risks can cause loss of irreplaceable resources; 3.1.12 Proposed impact management actions and impact management outcomes proposed by the specialist for inclusion in the Environmental Management Programme (EMPr);	**Part B:** Sections 5 & 6 (flora) **Part C:** Sections 5 & 6 (fauna)
3.1.13	A motivation must be provided if there were development footprints identified as per paragraph 2.3.6 above that were identified as having a "low" terrestrial biodiversity sensitivity and that were not considered appropriate;	**Part B:** Section 4 (flora) **Part C:** Section 4 (fauna)
3.1.14	A substantiated statement, based on the findings of the specialist assessment, regarding the acceptability, or not, of the proposed development, if it should receive approval or not; and	**To be completed by the EAP.**
3.1.15	Any conditions to which this statement is subjected.	**Part B:** Section 6 (flora) **Part C:** Section 6 (fauna)
3.2	The findings of the Terrestrial Biodiversity Specialist Assessment must be incorporated into the Basic Assessment Report or the Environmental Impact Assessment Report, including the mitigation and monitoring measures as identified, which must be incorporated into the EMPr where relevant.	**To be completed by the EAP.**
3.3	A signed copy of the assessment must be appended to the Basic Assessment Report or Environmental Impact Assessment Report.	

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GLOSSARY OF TERMS

Alien species (syn. exotic species; non-native species)	A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers.
Baseline information (IEM Series)	Information derived from data that: • records the existing elements and trends in the environment; and • records the characteristics of a given project proposal.
Biological diversity or Biodiversity (as per the definition in the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEMBA)	The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and includes diversity within species, between species, and of ecosystems.
Biodiversity priority areas (Skowno et al., 2019)	Features in the landscape or seascape that are important for conserving a representative sample of ecosystems and species, for maintaining ecological processes, or for the provision of ecosystem services. They include the following categories, most of which are identified based on systematic biodiversity planning principles and methods: protected areas, Critically Endangered (CR) and Endangered (EN) ecosystems, Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA), Freshwater Ecosystem Priority Areas (FEPA), high water yield areas, flagship free-flowing rivers, priority estuaries, focus areas for land-based protected area expansion, and focus areas for offshore protection. Marine ecosystem priority areas and coastal ecosystem priority areas have yet to be identified but will be included in future. The different categories are not mutually exclusive and, in some cases, overlap, often because a particular area or site is important for more than one reason. They should be complementary, with overlaps reinforcing the importance of an area.
Biological diversity or Biodiversity (National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA))	The variability among living organisms from all sources including, terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
Biome (Mucina and Rutherford (2006); after Low and Rebelo (1998))	A broad ecological spatial unit representing major life zones of large natural areas – defined mainly by vegetation structure, climate, and major large-scale disturbance factors (such as fires).
Bioregion (Mucina and Rutherford (2006))	A bioregion is a composite of spatial (vegetation) units sharing similar biotic and physio-geographical features and connected by processes operating on a regional sale.
Critical Biodiversity Area (CBA; SANBI, 2020)	An area that must be maintained in a good ecological condition (natural or semi-natural state) in order to meet biodiversity targets. CBAs collectively meet biodiversity targets for all ecosystem types, as well as for species and ecological processes that depend on natural or semi-natural habitat that have not already been met in the protected area network. CBAs are identified through a systematic biodiversity planning process in a configuration that is complementary, efficient and avoids conflict with other land uses where possible.
Corridor (van Wilgen et al., 2020)	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Critically Endangered (CR, i.e., International Union for Conservation of Nature (IUCN) Red List category (Skowno et al., 2019)	**Applied to both species/taxa and ecosystems**: A species is CR when the best available evidence indicates that it meets at least one of the five IUCN criteria for CR, indicating that the species is facing an extremely high risk of extinction. CR ecosystem types are at an extremely high risk of collapse. Most of the ecosystem type has been severely or moderately modified from its natural state. The ecosystem type is likely to have lost much of its natural structure and functioning, and species associated with the ecosystem may have been lost. CR species are those considered to be at extremely high risk of extinction.

Degradation (Skowno et al., 2019)	The many human-caused processes that drive the decline or loss in biodiversity, ecosystem functions or ecosystem services in any terrestrial and associated aquatic ecosystems.
Development footprint (as per the National Environmental Management Act, 1998 (Act No. 107 of 1998) - NEMA definition)	"In respect of land, means any evidence of its physical transformation as a result of the undertaking of any activity"
Ecological Support Area (ESA; Skowno et al., 2019)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Endangered (EN, i.e., IUCN Red List category (Skowno et al., 2019))	**Applied to both species/taxa and ecosystems**: A species is EN when the best available evidence indicates that it meets at least one of the five IUCN criteria for EN, indicating that the species is facing a very high risk of extinction. EN ecosystem types are at a very high risk of collapse. EN species are those considered to be at very high risk of extinction.
Endemic species (SANBI, 2020)	A species that is naturally restricted to a particular, well-defined region, i.e., species that are only found within a pre-defined area. There can therefore be sub-continental (e.g., southern Africa), national (South Africa), provincial, regional, or even within a particular mountain range.
Ground·Truth	To check the accuracy of (remotely sensed data) by means of in-situ observations.
Habitat (NEMBA)	A place where a species or ecological community naturally occurs.
Important Bird and Biodiversity Area (IBA) (Marnewick et al, 2015a; 2015b)	The IBA Programme identifies and works to conserve a network of sites critical for the long-term survival of bird species that: are globally threatened, have a restricted range, are restricted to specific biomes/vegetation types or sites that have significant populations.
Listed alien species	All alien species that are regulated in South Africa under the NEMBA, Alien and Invasive Species Regulations, 2020.
Least Concern (LC)	Unlikely to become extinct in the near future. A least-concern species is a species that has been categorized by the IUCN as evaluated as not being a focus of species conservation. They do not qualify as threatened, near threatened, or (before 2001) conservation dependent.
Least Threatened	Least threatened ecosystems are still largely intact.
Near Threatened (NT)	Close to being at high risk of extinction in the near future **(according to IUCN)**.
Quarter Degree Square (QDS) (SANBI, 2020)	A way of dividing the longitude latitude degree square cells into smaller squares of 15' × 15' (roughly 24 × 27 km), forming in effect a system of geocodes.
Red Data Listed (RDL) species	According to the Red List of South African plants (http://redlist.sanbi.org/) and the IUCN, organisms that fall into the Extinct in the Wild (EW), CR, EN, Vulnerable (VU) categories of ecological status.
Resource (ecological)	A resource is a substance or object in the environment required by an organism for normal growth, maintenance, and reproduction. Resources can be consumed by one organism and, as a result, become unavailable to another organism.
Species of Conservation Concern (SCC)	The term SCC in the context of this report refers to all RDL and IUCN listed threatened species as well as protected species of relevance to the project.
Terrestrial Species (SANBI, 2020)	For the purposes of the species environmental guidelines (SANBI, 2020), terrestrial species are considered to represent species that are not exclusively marine and occur on land (at least for a portion of their life cycle). This includes amphibians (frogs and toads) but excludes other freshwater aquatic species which are considered to be aquatic (e.g., fish, diatoms and aquatic macroinvertebrates). This definition is not an accurate biological definition but rather applied in this manner to align with the Protocol on Terrestrial Biodiversity.
Threatened ecosystem (Skowno et al., 2019)	An ecosystem that has been classified as CR, EN or VU, based on an analysis of ecosystem threat status. A threatened ecosystem has lost or is losing vital aspects of its structure, function, or composition. The Biodiversity Act allows the Minister of Environmental Affairs or a provincial Member of the Executive Council (MEC) for Environmental Affairs to publish a list of threatened ecosystems. To date, threatened ecosystems have been listed only in the terrestrial environment. In cases where no list has yet been published by the

	Minister, such as for all aquatic ecosystems, the ecosystem threat status assessment in the National Biodiversity Assessment (NBA) can be used as an interim list in planning and decision making.
Threatened species	A species that has been classified as CR, EN or VU, based on a conservation assessment (Red List), using a standard set of criteria developed by the IUCN for determining the likelihood of a species becoming extinct. A threatened species faces a high risk of extinction in the near future.
Vulnerable (VU) i	Applied to both species/taxa and ecosystems: A species is VU when the best available evidence indicates that it meets at least one of the five IUCN criteria for VU, indicating that the species is facing a high risk of extinction. An ecosystem type is Vulnerable when the best available evidence indicates that it meets any of the criteria A to E for VU and is then considered to be at a high risk of collapse (IUCN Red List category (Skowno et al., 2019).

LIST OF ACRONYMS

AIP	Alien and Invasive Plant
BGIS	Biodiversity Geographic Information Systems
BOP	Balance of plant
CARA	Conservation of Agricultural Resources Act, 1983 [Act No. 43 of 1983]
CBA	Critical Biodiversity Area
CCGT	Combined Cycle Gas Turbine
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and the Environment
E-GIS	Environmental Geographical Information Systems
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EGI	Electricity Grid Infrastructure
EIA	Environmental Impact Assessment
EN	Endangered
ESA	Ecological Support Area
EW	Extinct in the Wild
GE	General Electric
GIS	Geographic Information Systems
GN	Government Notice
ha	Hectares
HRSG	Heat Recovery Steam Generator
IBA	Important Bird and Biodiversity Area
IDZ	Industrial Development Zone
IUCN	International Union for Conservation of Nature
km	kilometres
km2	Square kilometres
kV	Kilovolt
KZN	KwaZulu-Natal
KZNSCP	Kwazulu-Natal Systematic Conservation Plan
m^2	Square metres
MAP	Mean annual precipitation
MAPE	Mean Annual Potential Evaporation
MASMS	Mean Annual Soil Moisture Stress
MAT	Mean Annual Temperature
MFD	Mean Frost Days
MW	Megawatt
NBA	National Biodiversity Assessment
NCMAA	KwaZulu-Natal Nature Conservation Ordinance, 1974 (Ordinance No. 15 of 1974)
NEMA	National Environmental Management Act, 1998 [Act No. 107 of 1998]
NEMBA	National Environmental Management: Biodiversity Act, 2004 [Act No. 10 of 2004]
NEMPAA	National Environmental Management: Protected Areas Act, 2003 [Act No. 57 of 2003]
NFA	National Forest Act, 1998 [Act No. 84 of 1998]
NT	Near Threatened
NYBA	Not yet been assessed
NPAES	National Protected Area Expansion Strategy
POC	Probability of Occurrence
QDS	Quarter Degree Squares
RDL	Red Data listed
RLE	Red List of Ecosystems
SABAP 2	South African Bird Atlas Project 2
SACAD	South African Conservation Areas Database
SACNASP	South African Council for Natural Scientific Professions

SANBI	South African National Biodiversity Institute
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
SSVR	Site Sensitivity Verification Report
STS	Scientific Terrestrial Services [Pty] Ltd
SWSA	Strategic Water Source Areas
TOPS	Threatened or Protected Species
VEGMAP	Vegetation Map Project
VU	Vulnerable
WSA	Water Source Areas

1 INTRODUCTION

Scientific Terrestrial Services (Pty) Ltd (hereafter referred to as “STS”) was appointed to undertake a terrestrial biodiversity assessment as part of the Environmental Authorisation (EA) process for the proposed Mabasa 750-megawatt (MW) Combined Cycle Gas Turbine (CCGT) power plant. The project is located within the uMhlathuze Local Municipality and the King Cetshwayo District Municipality in KwaZulu-Natal Province. The defined study area (i.e., the CCGT power plant project area) for this assessment is situated within the Richards Bay Industrial Development Zone (IDZ), specifically Special Economic Zone Phase 1F, approximately 5 kilometres (km) east of the Nseleni Nature Reserve and 2 km north-west of central Richards Bay.

The infrastructure associated with the project (described in detail in Section 1.1) is collectively referred to in this report as the “proposed Mabasa Project”. All project components are located within the study area; refer to Figure 1 – 2 for an indication of locality and scale of the study area.

1.1 Project Description (as provided by the proponent)

The study area is situated within a predominantly developed landscape, with the immediate surroundings characterised by industrial zones, nearby residential developments (approximately 1.3 km from the study area), and various service-related land uses (e.g. petrol stations). The section below has been summarised from the technical documentation provided by the Environmental Assessment Practitioner (EAP).

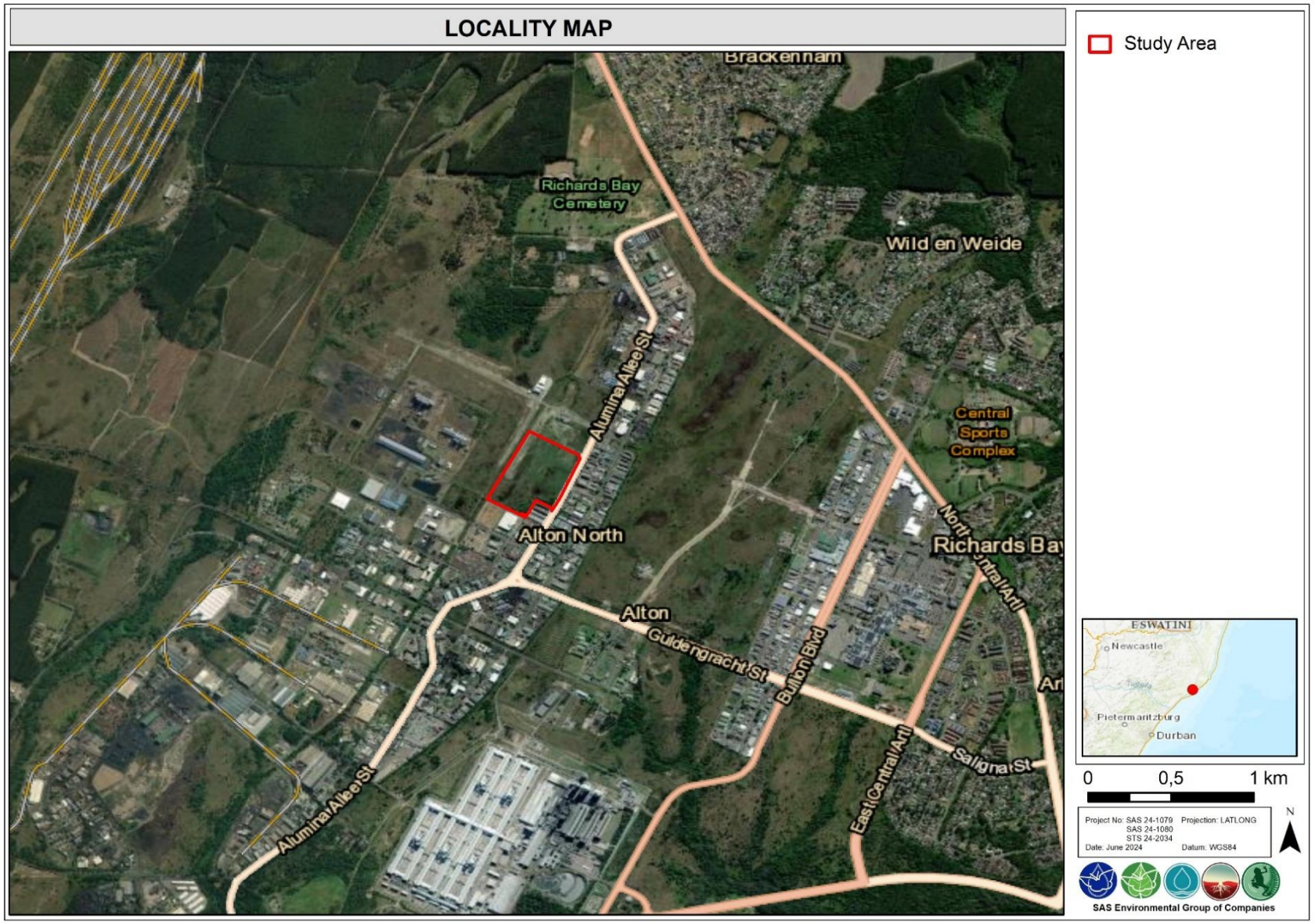


Figure 1: Digital satellite image depicting the study area within greater project area in relation to surrounding area.

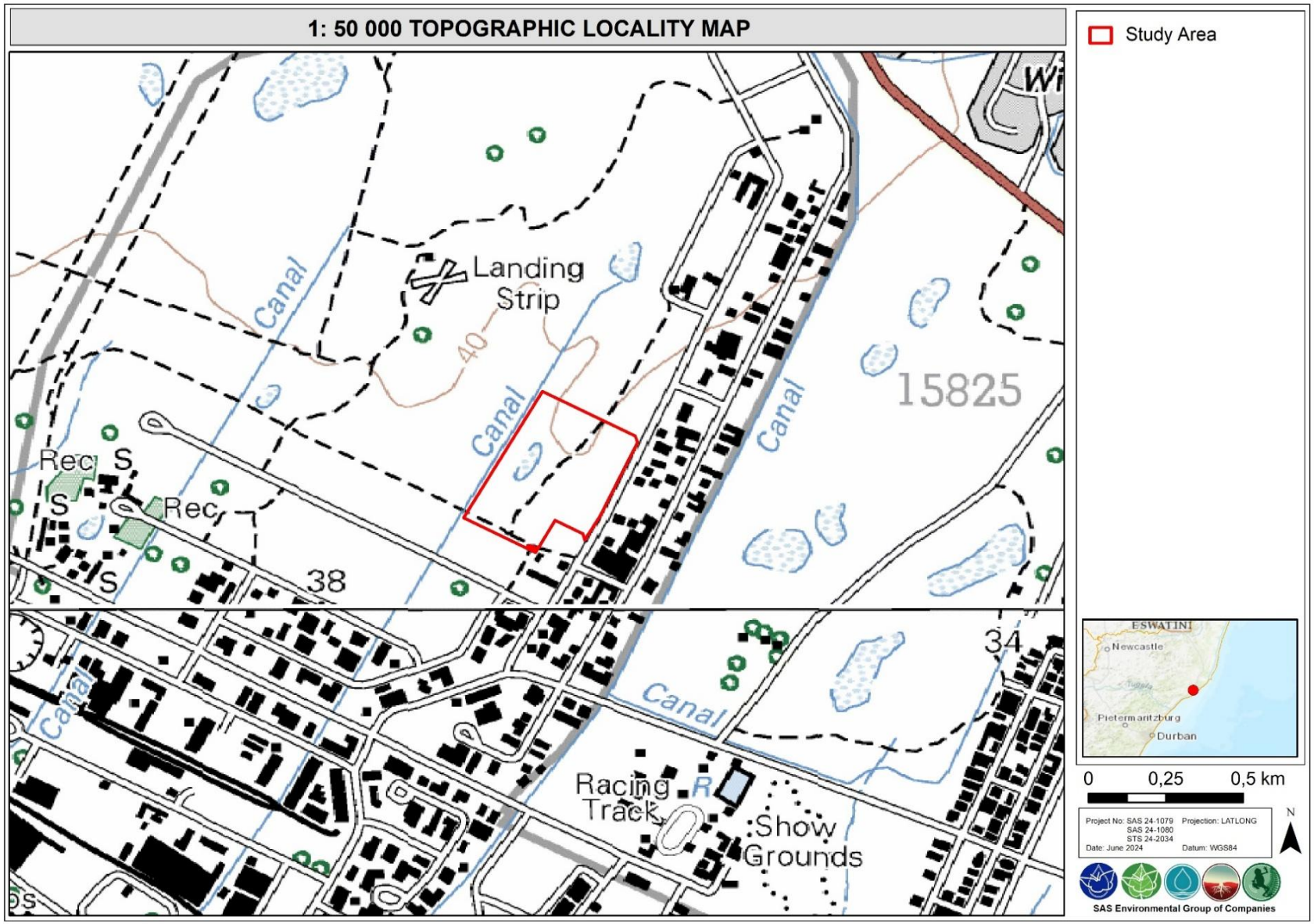


Figure 2: The study area depicted on a topographical map in relation to the surrounding area.

1.1.1 Power Plant Description

The proposed CCGT power plant (the "Plant") will be designed to provide a highly reliable, efficient, and low cost means of generating electricity. Design features of the Plant will be carefully considered to provide the optimum balance between capital cost and operation and maintenance benefits, whilst considering environmental impacts associated with combustion of fuel and using the best available technologies.

The scope of supply for the Plant will be based on a "2+2+1 combination" comprising of two General Electric (GE) Frame gas turbines (the "Combustion Turbine") each with a dedicated Heat Recovery Steam Generator (the "HRSG") to generate and supply steam to a shared steam turbine (the Combustion Turbine, HRSG, and steam turbine together known as the "Power Plant").

Generators attached to each of the Combustion Turbines and steam turbines will supply electrical power to a grid. The Combustion Turbines can fire on a variety of fuels however most commonly natural gas or light distillate oil. Specific calculations will be made based on the fuel availability for a specific Project.

The Plant will comprise of the following key equipment (refer to Figure 3):

- Two (2) General Electric Frame 9 (model 9F.03) combustion turbines and generators;
- Two (2) triple pressure, 3 drum, natural circulation HRSG;
- One (1) condensing steam turbine and generator;
- One (1) de-aerating surface condenser;
- One (1) induced draft cooling tower;
- Balance of plant (BOP) equipment consisting of Pumps, Heat Exchangers, Transformers, Power Electrics, etc;
- One (1) integrated plant distribution control system; and
- 275 kilovolt (kV) Switchyard comprising of three (3) x 15 kV to 275 kV step-up transformers and one (1) station auxiliary transformer (the rating to be defined during detailed design).

The Plant will be designed for base load operations at 500 MW in Simple Cycle and 750 MW in Combined Cycle on 24 hours a day, seven days a week basis.

1.1.2 Project Site and Plant Arrangement

The overall site and building arrangements have been developed to minimise space requirements while maintaining ample access for operation and maintenance activities. The land area required for the Project is 130,000 square metres (m^2) or 13 hectares (ha).

The plant layout remains conceptual and will be refined following: (i) the completed site verification assessment, (ii) the outcomes of the geotechnical soil investigation, (iii) confirmation of the location and alignment of the transmission line and grid connection point, (iv) the positioning of the fuel gas pipeline on site, (v) the identification of existing on-site utilities, and (vi) environmental considerations arising from the ongoing impact assessment process.

The electrical switchgear and associated auxiliary equipment are proposed to be located within purpose-built structures. The steam turbines will likewise be housed within a dedicated building (the “Steam Hall”), which will accommodate technical staff offices, locker and ablution facilities, a workshop, a laboratory, and storage areas. All other major equipment is expected to be designed for outdoor operation.

Adequate operational, administrative, and support facilities are incorporated into the conceptual design. A central control room will provide a controlled environment for sensitive electrical equipment and enable operators to monitor and manage plant functions. A main office building is proposed to accommodate plant management and administrative staff and will include supporting facilities such as a kitchenette, ablution facilities, a first aid room, and a prayer room. Parking areas will be provided adjacent to office buildings.

A demineralised water storage tank and associated system will supply boiler feedwater to the HRSGs. The plant is expected to include one induced draft cooling tower system, although the source of make-up water is yet to be confirmed.

A dedicated fire protection system will be included, comprising water storage, a pumping system, and a pressurised ring main with strategically positioned fire hydrants, as well as firefighting equipment, office sprinkler systems, fire extinguishers, and a deluge system for the switchyard.

Site access roads will be designed to support normal operations and maintenance requirements, including laydown areas adjacent to major equipment. Road infrastructure, including associated ducting and drainage crossings, will be designed to accommodate the axle loads and turning requirements of large trucks and mobile cranes.

The plant layout will incorporate appropriate stormwater management measures to facilitate the drainage of surface water. Oily water separators will be installed at key locations to capture runoff and wash water from maintenance activities. These systems will be designed to treat and discharge water to an acceptable standard prior to release into the drainage system.

Perimeter fencing will be provided around both the high-voltage switchyard and the broader plant area. Appropriate lighting and security systems will also be installed.

The design assumes that potable water, telecommunications infrastructure, power evacuation connections, and sewage (including raw water supply and sanitary waste management) will be available at the plant boundary.

1.1.3 Assessment Approach and Project Context

In accordance with the requirements of the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations (2014, as amended), the environmental assessment process for the proposed Mabasa Project has been undertaken in a phased manner.

As part of the application process, a Site Sensitivity Verification Report (SSVR; STS 24-2034 (2024a)) was compiled to verify the environmental sensitivities identified by the Department of Forestry, Fisheries, and the Environment's (DFFE's) national web-based Environmental Screening Tool, in line with the applicable protocols for specialist assessments (Government Gazette No. 43110 of 20 March 2020 and Government Gazette No. 43855 of 30 October 2020). The SSVR confirmed and/or refined the sensitivities associated with the Animal, Plant, and Terrestrial Biodiversity Themes and identified the requirement for detailed specialist assessments.

Following this, a terrestrial biodiversity scoping assessment (STS 24-2034 (2024b)) was undertaken to provide a preliminary evaluation of the receiving environment, identify key ecological constraints, and inform the focus areas for further investigation.

The present EIA builds on these preceding studies and presents the findings of the detailed Terrestrial Biodiversity Specialist Assessment Report (which include the Floral and Faunal Assessments - Part B and Part C of the report respectively). This includes a comprehensive evaluation of habitats, species of conservation concern (SCC), and ecological processes within the study area, as well as an assessment of potential impacts associated with the proposed development and the identification of appropriate mitigation measures.

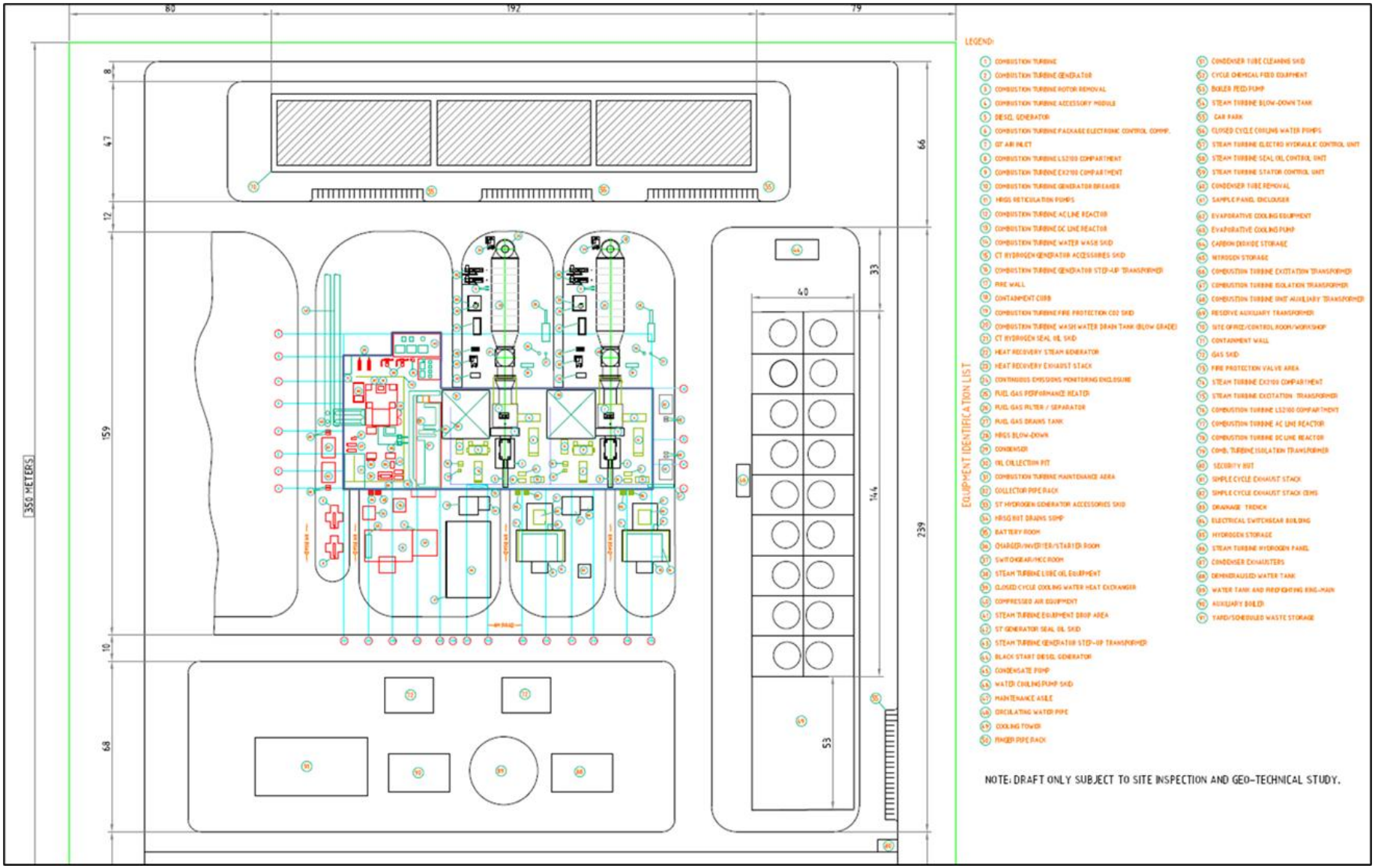


Figure 3. Conceptual layout of the proposed CCGT Power Plant.

1.2 Structure of the Biodiversity Report

Part A of this report served to introduce the study area, as well as the general approach to the study. Part A also presents the results of general desktop information reviewed as part of the study, including the information generated by the relevant authorities, as well as the context of the site in relation to the surrounding anthropogenic activities and ecological character.

Part B presents the results of the floral field assessment, data analyses and discussion of the results. Part B then presents the results of the impact assessment, where the impacts on floral ecology and biodiversity are discussed.

Part C presents the results of the faunal field assessment, data analyses and discussion of the results. Part C then presents the results of the impact assessment, where the impacts on faunal ecology and biodiversity are discussed.

1.3 Scope of Work

Specific outcomes in terms of Part A of the report are as follows:

- To update the desktop assessment using all relevant information as presented by the South African National Biodiversity Institute's (SANBI) Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the DFFE Environmental Geographical Information Systems (E-GIS) website (https://egis.environment.gov.za/). The desktop assessment aims to gain background information on the physical habitat and potential floral and faunal ecology associated with the study area;
- To state the indemnity and terms of use of this report (Appendix A) as well as to provide the details of the specialists who prepared the reports (Appendix E);
- To outline the legislative requirements that were considered for the assessment (Section 1.5 and Appendix B of this report);
- To provide a Site Sensitivity Verification (Section 4) to outline the type of reporting requirements needed for specialist reports applicable to the EIA; and
- To provide the methodologies followed relating to the impact assessment and development of the mitigation measures (Appendix C) that were applied in the floral and faunal assessments (Part B and Part C).

1.4 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The biodiversity desktop assessment is confined to the study area and does not include detailed results of the adjacent properties, although ecological important or sensitive areas according to the desktop databases of surrounding areas and the greater project area have been included on the relevant maps;
- The infilling of wetlands within the site has also been authorised under the existing EA and is excluded from the present assessment. All wetlands within the study area, will be infilled to allow for development as per the EA granted in 2016 (Ref 14/12/16/3/3/2/665).
- The DFFE Screening Tool provides names of Sensitive Species likely to be present within the study area and its surrounds. Within the screening tool outcome, the names of some species are not provided. These species are rather assigned a number keeping them unidentifiable (e.g., Sensitive Species 1). This procedure is followed because of the vulnerability of the species to threats such as illegal harvesting and overexploitation. According to the best practice guidelines provided by the SANBI, the identity of Sensitive Species may not appear in the final EIA report nor any of the specialist reports released into the public domain. However, the conservation threat status of such species has been provided; and
- It is important to note that although all data sources used provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the assessed area's actual site characteristics at the scale required to inform more intricate planning, e.g., at the scale needed for an EA. Nevertheless, this information is useful as background information to the study and is important in legislative contextualisation of risk and impact and was used as a guideline to inform the biodiversity assessment (refer also to Parts B and C), and to focus on areas and aspects of increased conservation importance. It must, however, be noted that site assessment of key areas may potentially contradict the information contained in the relevant databases, in which case the site verified, ground-truthed information must carry more weight in the decision-making process.

1.5 Legislative Requirements

The following legal requirements were considered during the assessment:

- The Constitution of the Republic of South Africa, 1996[4];
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA);
- The NEMA;
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
    - Government Notice (GN) number 2747: The Revised National List of Ecosystems that are Threatened and in need of Protection, published in Gazette No. 47526, dated 18 November 2022, as it relates to the NEMBA;
    - GN number R.1020: Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020 as it relates to the NEMBA;
    - Government Notice number 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 September 2020; and
    - GN number 30568: Threatened or Protected Species (TOPS) list dated 14 December 2007, as it relates to the NEMBA.
- The National Forest Act, 1998 (Act No. 84 of 1998, amended) (NFA);
    - GN 1935: List of Protected Tree Species as published in the Government Gazette 46094 dated 25 March 2022, as it relates to the NFA;
- The National Environmental Management: Protected Areas Act, 2003 (Act. No. 57 of 2003) (NEMPAA); and
- Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE national environmental screening report required with an application for EA as identified in regulation 16(1)(v) of EIA Regulations:
    - For the Terrestrial Biodiversity Theme: GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity as published in Government Gazette 43110 dated 20 March 2020; and
    - For Animal and Plant Species Themes: GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant and Animal Species as published in Government Gazette 43855 dated 30 October 2020 (as amended in GN 3717 of 2023).

[4] Since 1996, the Constitution has been amended by seventeen amendments acts. The Constitution is formally entitled the 'Constitution of the Republic of South Africa, 1996". It was previously also numbered as if it were an Act of Parliament – Act No. 108 of 1996 – but since the passage of the Citation of Constitutional Laws Act, neither it nor the acts amending it are allocated act numbers.

- The KwaZulu-Natal Nature Conservation Ordinance, 1974 (Ordinance No. 15 of 1974), as amended by the KwaZulu-Natal Nature Conservation Management Amendment Act, 1999 (Act No. 5 of 1999) (NCMAA).

The details of each of the above, as they pertain to this study, are provided in Appendix B of this report.

2 ASSESSMENT APPROACH

Maps and digital satellite images were generated prior to the field assessment to determine broad habitats, vegetation types and potentially sensitive sites. Relevant databases and documentation that were considered during the assessment of the study area include[5]:

- National Protected Areas Expansion Strategy (NPAES) – 2018 database (DEA, 2018);
- The South African Conservation Areas Database, Quarter 3 (SACAD, 2025);
- The South African Protected Areas Database, Quarter 3 (SAPAD, 2025);
- The Kwazulu-Natal Systematic Conservation Plan (KZNSCP) (EKZNW, 2011);
- The National Vegetation Map Project (VEGMAP), with the below vector dataset used for information on Biomes, Bioregions and Vegetation Type(s):
    - 2024 Final Vegetation Map of South Africa, Lesotho, and Swaziland (SANBI, 2024).
- The 2022 Red List of Ecosystems (RLE) for the terrestrial realm for South Africa (SANBI 2022a and 2022b). This database replaces the 2018 National Biodiversity Assessment (NBA) (SANBI, 2018a & 2018b) Terrestrial Assessment, which forms one of the base databases that the RLE database is generated upon;
- The Important Bird and Biodiversity Areas (IBA) Programme and vector dataset (BirdLife South Africa, 2015; Marnewick et al., 2015a and 2015b), in conjunction with the South African Bird Atlas Project 2 (SABAP 2);
- Strategic Transmission Corridors (DFFE, 2019);
- From the 2021 Strategic Water Source Areas (SWSA) project:
    - 2021 SWSA **Surface water** (Lötter & Le Maitre (2021) and Mpumalanga Tourism and Parks Agency (MTPA: 2021)).
- The International Union for Conservation of Nature (IUCN) list of threatened species (IUCN, 2022a and 2022b); and

[5] Datasets obtained from:

- SANBI BGIS (2023). The South African National Biodiversity Institute - Biodiversity GIS (BGIS) [online]. URL: http://bgis.sanbi.org as retrieved in 2023; and
- Department of Environmental Affairs (DEA) Environmental Geographical Information Systems (E-GIS) website. URL: https://egis.environment.gov.za/

- The DFFE Screening Tool (accessed 2026).

The field assessment (13th of June 2024) aimed to determine whether any changes had occurred in the ecological status of the study area and to ground-truth the findings of the desktop assessments.

3 RESULTS OF THE DESKTOP ANALYSIS

The following section contains data accessed as part of the desktop assessment and are presented as a “dashboard” report below (Tables 1 and 2). The dashboard report aims to present concise summaries of the data on as few pages as possible, allowing for improved assimilation of results by the reader. Where required, further discussion and interpretation are provided.

Table 1: Summary of the biodiversity characteristics associated with the study area [Quarter Degree Squares (QDS) 2832CA]. Abbreviations are provided at the bottom of the table.

<table>
<tr><th colspan="7">DETAILS OF THE STUDY AREA IN TERMS OF MUCINA & RUTHERFORD (2006) AND THE NATIONAL VEGETATION MAP PROJECT (SANBI, 2018A) - ORIGINAL EXTENT OF MAPPED VEGETATION TYPE</th></tr>
<tr><td>Bioregion</td><td colspan="6">The study area is situated within the Indian Ocean Coastal Belt Bioregion.</td></tr>
<tr><td>Biome</td><td colspan="6">The study area is situated within the Indian Ocean Coastal Belt Biome.</td></tr>
<tr><td>Vegetation Type</td><td colspan="6">The study area is located within the Maputaland Wooded Grassland (CB 2) vegetation type.</td></tr>
<tr><td rowspan="3">Climate[6]</td><td colspan="6">Weak rainfall seasonality near the coast tending toward summer rainfall towards the interior. Relatively high precipitation attaining annual values up to 1 200 mm in coastal localities, decreasing rapidly to the interior.</td></tr>
<tr><td>Altitude (m)</td><td>MAP* (mm)</td><td>MAT* (°C)</td><td>MFD* (Days)</td><td>MAPE* (mm)</td><td>MASMS* (%)</td></tr>
<tr><td>20 – 120</td><td>964</td><td>21</td><td>0</td><td>1902</td><td>68</td></tr>
<tr><td>Distribution</td><td colspan="6">KwaZulu-Natal Province and southern Mozambique.</td></tr>
<tr><td>Conservation</td><td colspan="6">Endangered (EN). Target 25%. About 17% statutorily conserved mainly in the Greater St Lucia Wetland Park. Some 46% transformed mostly for plantations and partly for cultivated land. The southern half of the area is not protected, and it is here that over 90% of the extent of the vegetation type has been transformed—mostly to pulpwood timber plantations, cane fields and informal settlements. Aliens include scattered populations of Chromolaena odorata and Lantana camara.</td></tr>
<tr><td>Geology and Soils</td><td colspan="6">Quaternary redistributed sand supporting yellowish redistributed sands of the Berea Formation (Maputaland Group). These are dystric regosols building dune crests, slopes, and relatively high-lying level plains. Water table found at depth 1.6–2.0 m below surface (and slightly deeper) in average rainfall years.</td></tr>
<tr><td>Vegetation & landscape features (Appendix F).</td><td colspan="6">Generally flat landscape of the Maputaland coastal plain supporting coastal sandy grasslands rich in geoxylic suffrutices[7], dwarf shrubs, small trees, and very rich herbaceous flora. Excluded from this unit are the many interdune depression wetlands and hygrophilous grasslands neighbouring the wooded grasslands.</td></tr>
<tr><th colspan="7">CONSERVATION DETAILS PERTAINING TO THE STUDY AREA (VARIOUS DATABASES)</th></tr>
<tr><td>NBA (2018)</td><td colspan="6">The NBA lists the Maputaland Wooded Grassland as moderately protected, with the study area situated within the remaining extent of this vegetation type.

DEFINITION: Ecosystem protection level tells us whether ecosystems are adequately protected or under-protected. Ecosystem types are categorised as not protected, poorly protected, moderately protected, or well protected, based on the proportion of each ecosystem type that occurs within a protected area recognised in the NEMPAA.</td></tr>
<tr><td>RLE (2022) (Figure 4)</td><td colspan="6">This database replaces the NBA (2018), which forms one of the base databases that the RLE database is generated upon. According to the RLE dataset (2022), the study area is situated within the remaining extents of the Maputaland Wooded Grassland vegetation type which is considered EN under Criterion B 1 (i) and likely not endemic to South Africa (Government of South Africa, 2022). Maputaland Wooded Grassland is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), placing the ecosystem type at risk of collapse. The decline in natural habitat by 88.69 square kilometres (km^2) in the last 28 years (1990-2018) has mostly been due to plantations, which now cover 486.88 km^2 of the ecosystem. Urban development is also one of the pressures on the ecosystem with 106.17</td></tr>
</table>

[6] Acronyms in this section includes MAP = Mean annual precipitation; MAT = Mean annual temperature; MAPE = Mean annual potential evaporation; MFD = Mean Frost Days; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply).

[7] In South Africa, geoxylic suffrutices are considered 'underground trees' - i.e., a growth form that typically only attains a hundredth to a tenth the height of a normal tree.

	km² covered by built-up areas. Agriculture is also a pressure with 14.42 km² covered by cropland and 100.66 km² covered by old fields. Additionally, the ecosystem is degraded by alien invasions by *Chromolaena odorata* and *Lantana camara* (Mucina et al. 2006). The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value. The revised list (known as the RLE 2022) is based on assessments that followed the IUCN RLE 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 (CR), 51 EN, and 14 vulnerable (VU) types). Following a series of consultations with conservation authorities and the public in 2020/21, the revised list of terrestrial ecosystems that are threatened and in need of protection was approved by the minister for implementation in August 2022. The revised list was published in the government gazette (gazette number 47526, notice number 2747) and came into effect on 18 November 2022.
SAPAD (2025, Q3)[8]; SACAD (2025, Q3)[9]; NPAES (2018)	According to the SAPAD (2025_Q3), the study area is located within a 10 km radius of two protected areas, namely: the **Enseleni Nature Reserve** (> approx. 5,2 km north) and the **Richards Bay Game Reserve** (> approx. 6,1 km south). Refer to **Figure 5**. The NPAES (2018) database indicates that the majority of the study area is located within a **Priority Focus Area.** Refer to **Figure 6.** According to the SACAD (2025_Q3), no conservation areas are located within 10 km of the study area.
IBA (2015) - Figure 7	The study area is located within 10 km of an IBA, namely the **Richards Bay Game Reserve IBA** (> approx. 6.1 km south).
DETAIL OF THE AREA OF INTEREST IN TERMS OF THE KZNSCP: TERRESTRIAL SYSTEMATIC CONSERVATION PLAN	
The Kwazulu-Natal Systematic Conservation Plan (KZNSCP) – Figure 8	The KZNSCP database provides a localised indication of vegetation units identified on a provincial level (EKZNW, 2011). According to the KZNSCP database, the study area is located within the following vegetation types: 1. Freshwater Wetlands, namely **Subtropical Freshwater Wetlands**; and 2. Maputaland Wooded Grassland. EKZNW (2011) classifies the Maputaland Wooded Grassland as EN and the Subtropical Freshwater features as VU.
Critical Biodiversity Area (CBA) Irreplaceable	The entire study area is located within an area considered to be **CBA irreplaceable area**. CBA areas are considered critical for meeting biodiversity targets and thresholds, which are required to ensure the persistence of viable populations of species and the functionality of ecosystems. CBA irreplaceable areas are identified as being Irreplaceable and often represent the only localities for which the conservation targets for one or more biodiversity features contained within can be achieved, i.e., there are no alternative sites available.

[8] SACAD (2025): The types of conservation areas that are currently included in the database are the following: 1. Biosphere reserves, 2. Ramsar sites, 3. Stewardship agreements (other than nature reserves and protected environments), 4. Botanical gardens, 5. Transfrontier conservation areas, 6. Transfrontier parks, 7. Military conservation areas and 8. Conservancies.

[9] SAPAD (2025): The definition of protected areas follows the definition of a protected area as defined in the National Environmental Management: Protected Areas Act, (Act 57 of 2003). Chapter 2 of the National Environmental Management: Protected Areas Act, 2003 sets out the "System of Protected Areas", which consists of the following kinds of protected areas - 1. Special nature reserves; 2. National parks; 3. Nature reserves; 4. Protected environments (1-4 declared in terms of the National Environmental Management: Protected Areas Act, 2003); 5. World heritage sites declared in terms of the World Heritage Convention Act; 6. Marine protected areas declared in terms of the Marine Living Resources Act; 7. Specially protected forest areas, forest nature reserves, and forest wilderness areas declared in terms of the National Forests Act, 1998 (Act No. 84 of 1998); and 8. Mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970).

STRATEGIC TRANSMISSION CORRIDORS – FIGURE 9	
The study area is located within the EGI East Expansion Corridor. The five strategic transmission corridors were assessed as part of the 2016 Electricity Grid Infrastructure (EGI) sea. These corridors were gazetted for implementation on 16 February 2018 in government gazette 41445, government notice 113. The gazette documented notice given by the Minister of Environmental Affairs of alternative procedures to be followed when applying for Environmental Authorisation (EA) for large-scale electricity transmission and distribution development activities, identified in terms of section 24(2)(a) of the National Environmental Management Act, 1998 (Act No. 107 Of 1998) (NEMA) in the identified strategic transmission corridors (i.e., areas declared as geographical areas of strategic importance).	
STRATEGIC WATER SOURCE AREAS (SWSA, 2021)	
Surface water SWSAs are defined as areas of land that supply a disproportionate (i.e., relatively large) quantity of mean annual surface water runoff in relation to their size. They include transboundary areas that extend into Lesotho and Swaziland. The sub-national Water Source Areas (WSAs) are not nationally strategic as defined in the report but were included to provide a complete coverage.	
Name and Criteria	The study area is not located within 10 km of a SWSA.

CBA = Critical Biodiversity Area, CR = Critically Endangered; EGI = Electricity Grid Infrastructure; EN = Endangered; ESA = Ecological Support Area; IBA = Important Bird Area; KZNSCP = Kwazulu-Natal Systematic Conservation Plan; MAP = Mean annual precipitation; MAPE = Mean annual potential evaporation; MASMS = Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply); MAT = Mean annual temperature; MFD = Mean Frost Days; MM = Millimeters; NBA = National Biodiversity Assessment; NEMA = National Environmental Management Act, NPAES = National Protected Areas Expansion Strategy; RLE = Red List of Ecosystems., SACAD = South African Conservation Areas Database; SAPAD = South African Protected Areas Database; SWSA = Strategic Water Source Area; VU = Vulnerable; and WSA = Water Source Areas .



Figure 4: The study area in relation to the remaining extent of threatened ecosystems as per the RLE (SANBI, 2022a, 2022b) and the associated protection level (NBA, 2018).

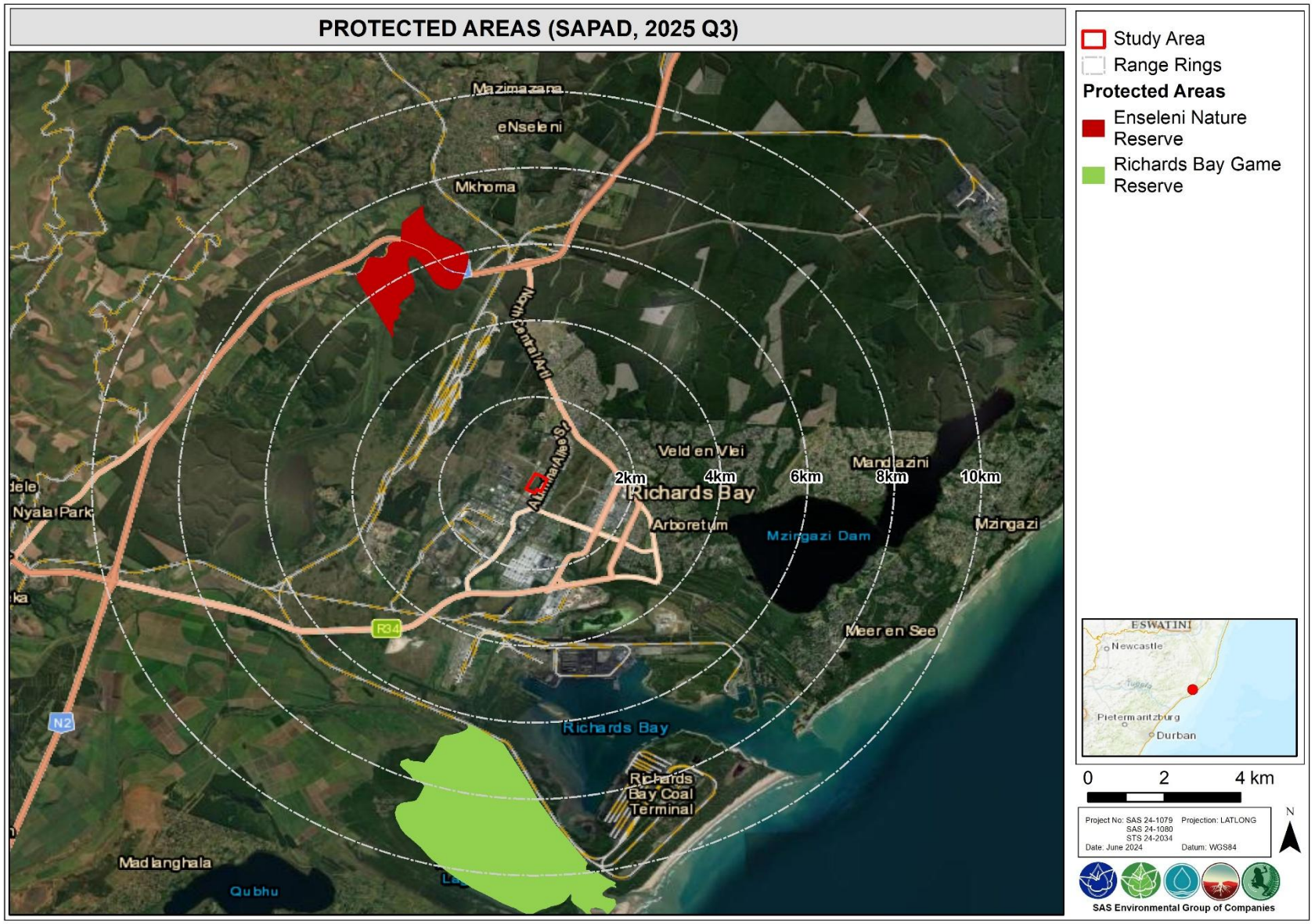


Figure 5: National protected areas as per SAPAD (Q3, 2025) associated with the study area.

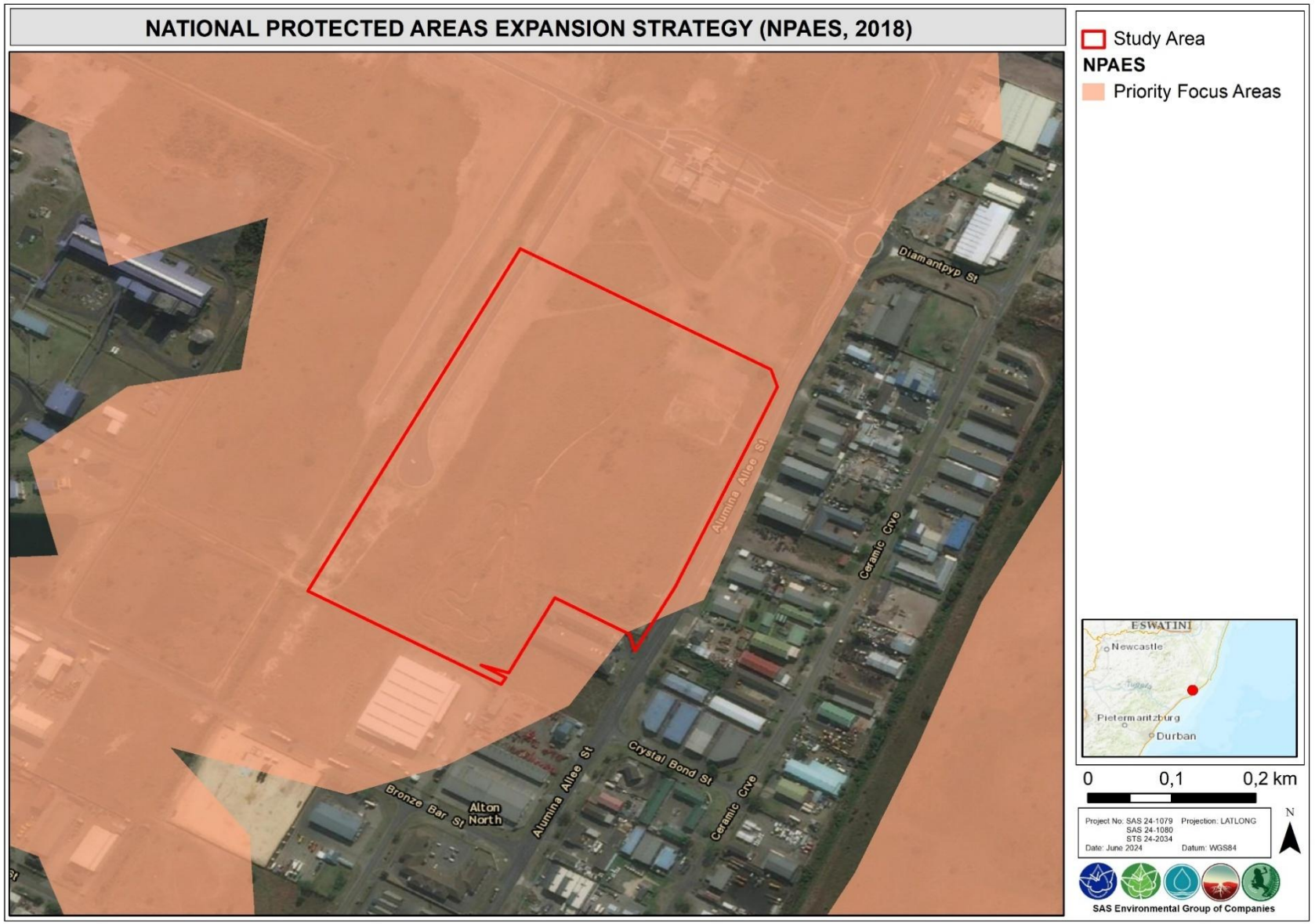


Figure 6: Priority Focus Areas (as per the 2018 NPAES) that are associated with the study area.

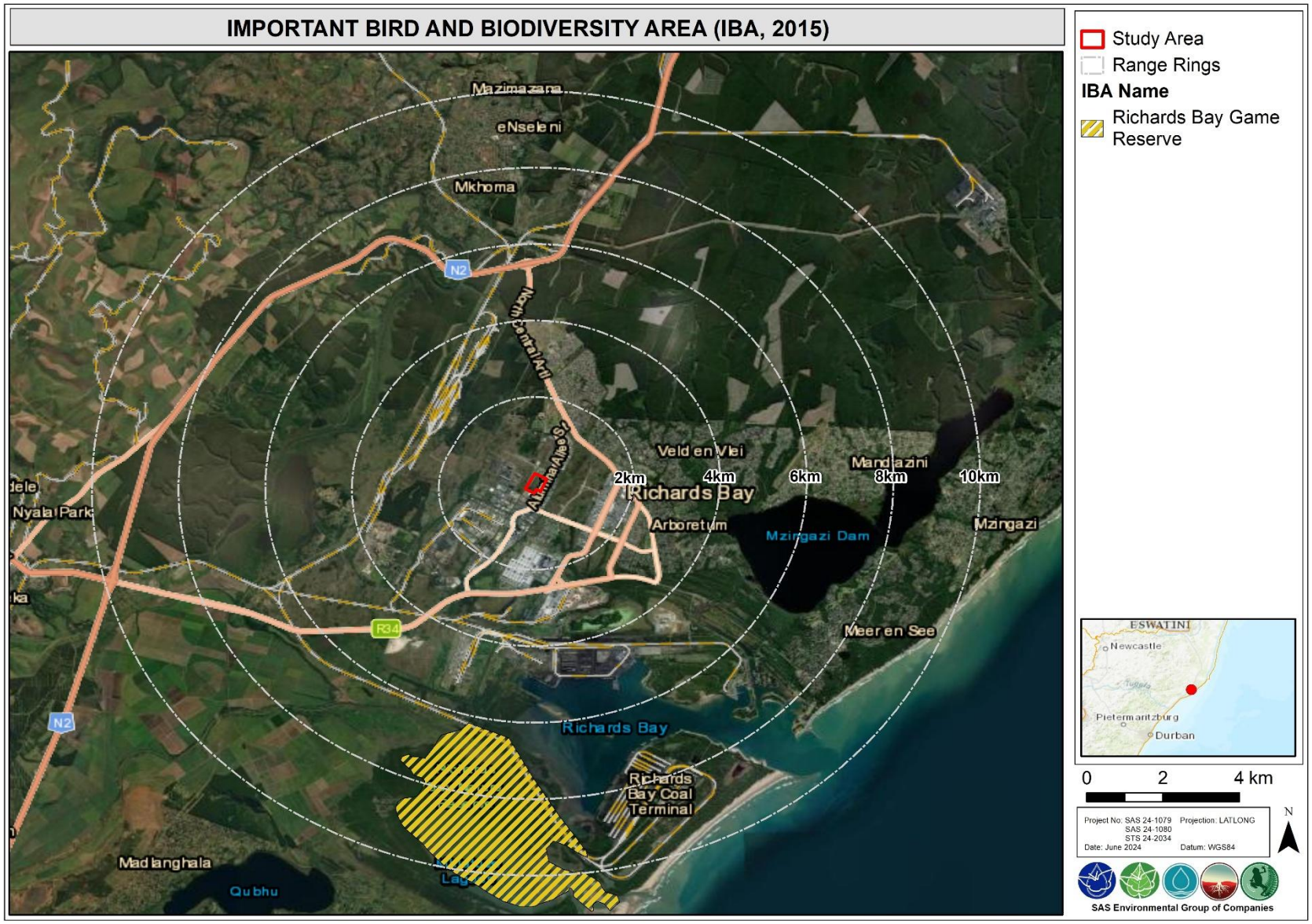


Figure 7: Important bird and biodiversity areas associated with the study area (IBA, 2015).

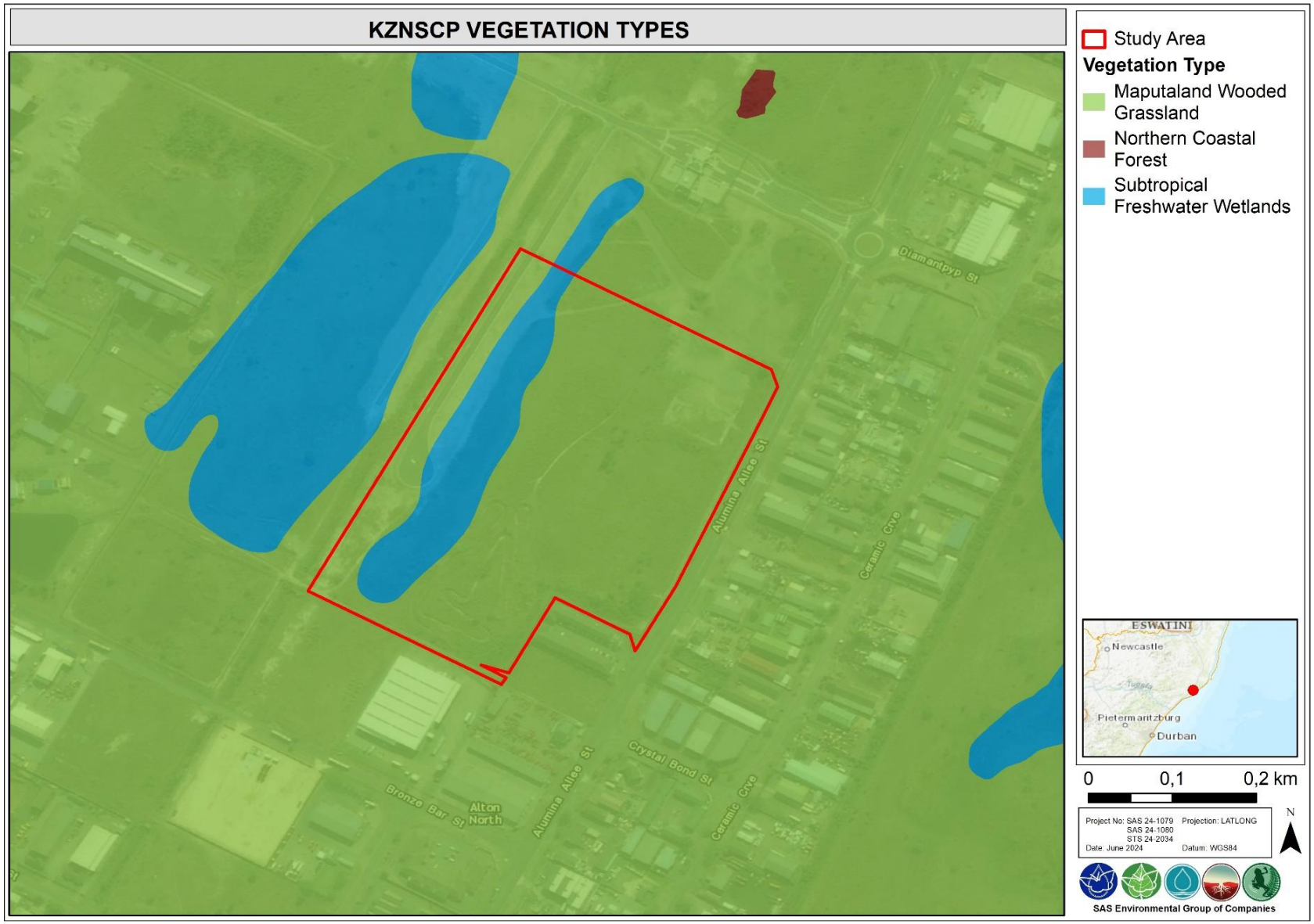


Figure 8: Vegetation types associated with the study area as per the KZNSCP.

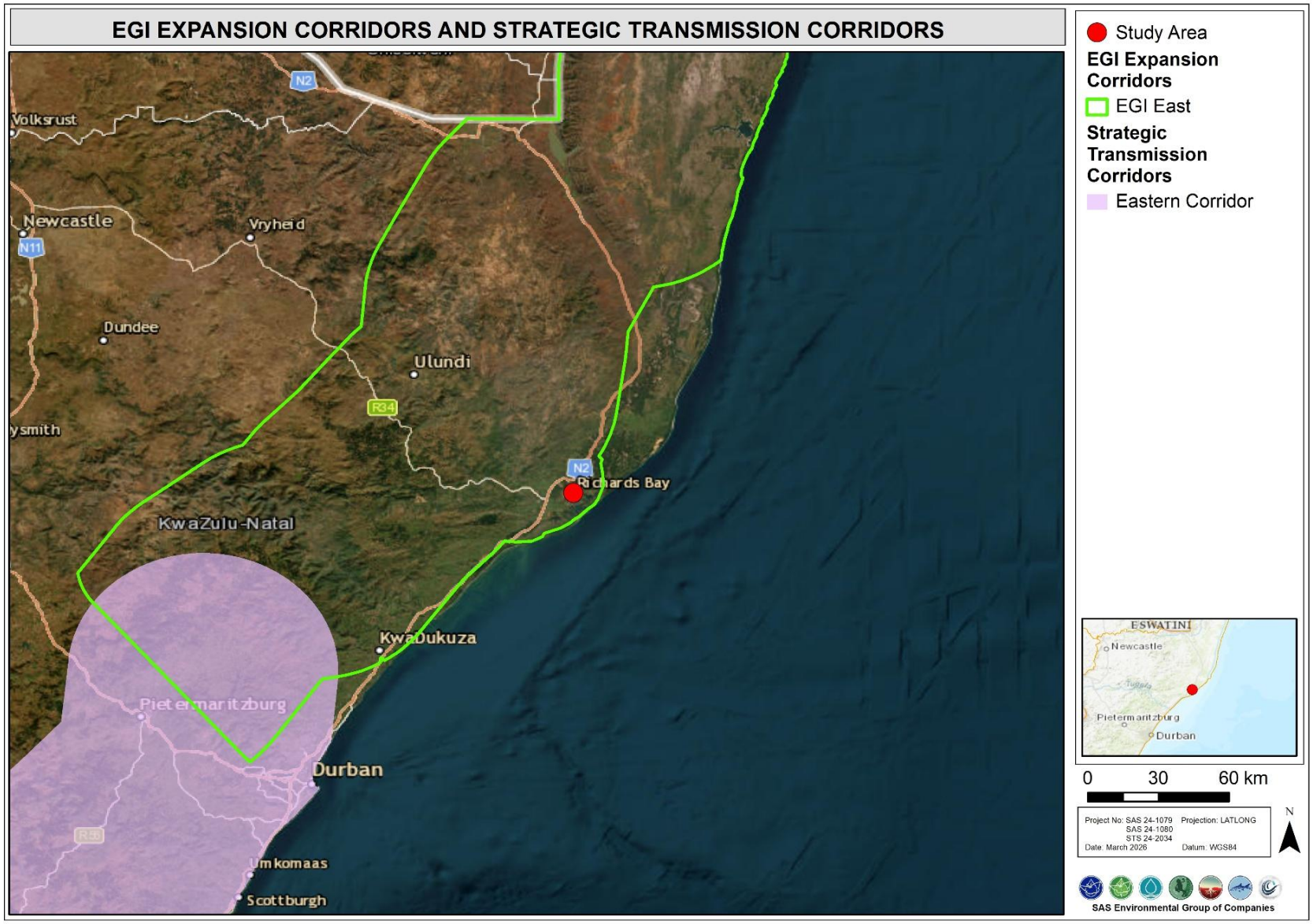


Figure 9:EGI Expansion and Strategic Transmission Corridors associated with the study area (DFFE, 2019).

4 SITE SENSITIVITY VERIFICATION

According to the "Protocols for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes ("the Protocols") published in Government Gazette No. 43110 on 20 March 2020 and Government Gazette No. 43855 on 30 October 2020, the EAP must verify the current use of the site in question and its environmental sensitivity as identified by the screening tool to determine the need for specialist inputs concerning the themes included in the Protocols. The Protocols are allowed for in terms of Sections 24(5)(a) and (h) and 44 of the NEMA. The Protocols must be complied with for every new EA application that is submitted after 9 May 2020. The screening tool identifies species and ecosystem spatial triggers likely to indicate environmental sensitivity associated with a particular proposed development site, which in turn **determines the necessity and requirements for specialist studies**. The screening tool evaluates 'environmental sensitivity' at a **larger scale** than that of a proposed development site and frequently includes modelled data that require **field verification/ ground-truthing**. As such, the initial site sensitivity verification is required to verify the screening tool outcomes, and such verified sensitivities are used to inform the minimum reporting requirements for the Plant Species, Animal Species, and Terrestrial Biodiversity Specialist Assessment Reports. The outcome of the screening tool is presented in Table 2.

Table 2: Screening Tool outcomes for the study area.

The Screening Tool is intended to allow for the pre-screening of sensitivities in the landscape to be assessed within the EA process. This assists with implementing the mitigation hierarchy by allowing developers to adjust their proposed development footprint to avoid sensitive areas. The different sensitivity ratings of the Plant [and Animal] Protocols are described below: ➢ Very High: Habitat for species that are endemic to South Africa, where all the known occurrences of that species are within an area of 10 km^2 are considered Critical Habitat, as all remaining habitat is irreplaceable. Typically, these include species that qualify under CR, EN, or VU D criteria of the IUCN or species listed as Critically/ Extremely Rare under South Africa's National Red List Criteria. For each species reliant on a Critical Habitat, all remaining suitable habitats have been manually mapped at a fine scale. ➢ High: Recent occurrence records for all threatened (CR, EN, VU) and/or rare endemic species are included in the high sensitivity level. ➢ Medium: Model-derived suitable habitat areas for threatened and/or rare species are included in the medium sensitivity level. ➢ Low: Areas where no threatened species are known or expected to occur.	
Animal Species Theme (Figure 10)	The entire study area occurs within a **high sensitivity class** as per the Screening Tool outcome. The triggered species include both High and Medium sensitivity species: **High:** ➢ *Circaetus fasciolatus* (Southern Banded Snake Eagle; CR); ➢ *Circus ranivorus* (African Marsh Harrier; EN); ➢ *Geokichla guttata* (Spotted Ground Thrush: EN); ➢ *Podica senegalensis* (African Finfoot: VU); ➢ *Polemaetus bellicosus* (Martial Eagle: EN); and ➢ *Stephanoaetus coronatus* (Crowned Eagle: VU). **Medium:** ➢ *Arytropteris basalis* (Flat-necked Shieldback: VU); ➢ *Balearica regulorum* (Grey Crowned Crane: EN);

	➢ *Crocodylus niloticus* (Nile Crocodile: VU); ➢ *Halcyon senegaloides* (Mangrove Kingfisher: EN); ➢ *Hyperolius pickersgilli* (Pickersgill's Reed Frog: EN); ➢ *Lycaon pictus* (African Wild Dog; EN); ➢ *Nettapus auratus* (African Pygmy Goose; VU); ➢ *Pelusios rhodesianus* (Variable Hinged Terrapin; VU); ➢ *Pomatonota dregii* (East Coast Katydid; VU); ➢ *Terathopius ecaudatus* (Bateleur: EN); and ➢ Sensitive species 8 (VU).
Plant Species Theme (Figure 11)	The northern and central sections of study area occur within a **medium sensitivity class**. A small section in the south-eastern section of the study area is in a **low sensitivity class**. Triggered species include: ➢ *Cassipourea gummiflua* var. *verticillata* (VU); ➢ *Emplectanthus cordatus* (VU); ➢ *Fimbristylis aphylla* (VU); ➢ *Freesia laxa* subsp. *azurea* (VU); ➢ *Nidorella tongensis* (EN); ➢ *Oxygonum dregeanum* subsp. s*treyi* (EN); ➢ *Pachycarpus concolor* subsp. *arenicola* (VU); ➢ *Pavonia dregei* (VU); ➢ *Senecio ngoyanus* (VU); ➢ Sensitive species 89 (VU); ➢ Sensitive species 191 (VU); ➢ Sensitive species 649 (VU); ➢ Sensitive species 1252 (VU); and ➢ *Thesium polygaloides* (VU).
Terrestrial Biodiversity Theme (Figure 12)	The entire extent of study area is within a **very high sensitivity area** according to the Terrestrial Biodiversity Theme outcome of the Screening Tool. Triggered biodiversity features include: the EN Maputaland Wooded Grassland threatened ecosystem, a CBA: Irreplaceable, as well as sections of Priority Focus Areas as per the NPAES.

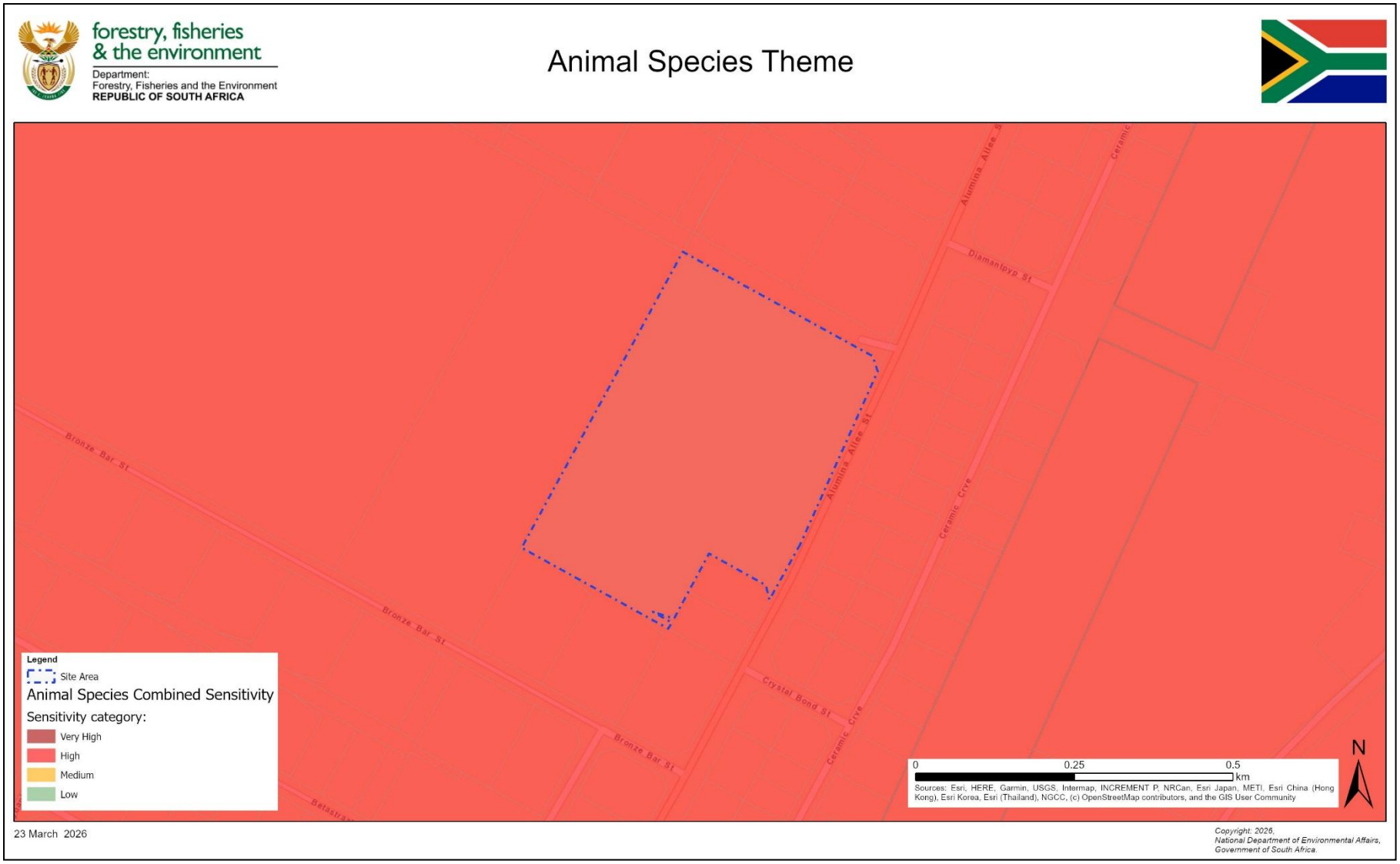


Figure 10: Animal Species Theme sensitivity for the study area as obtained from the Screening Tool (accessed 2026).

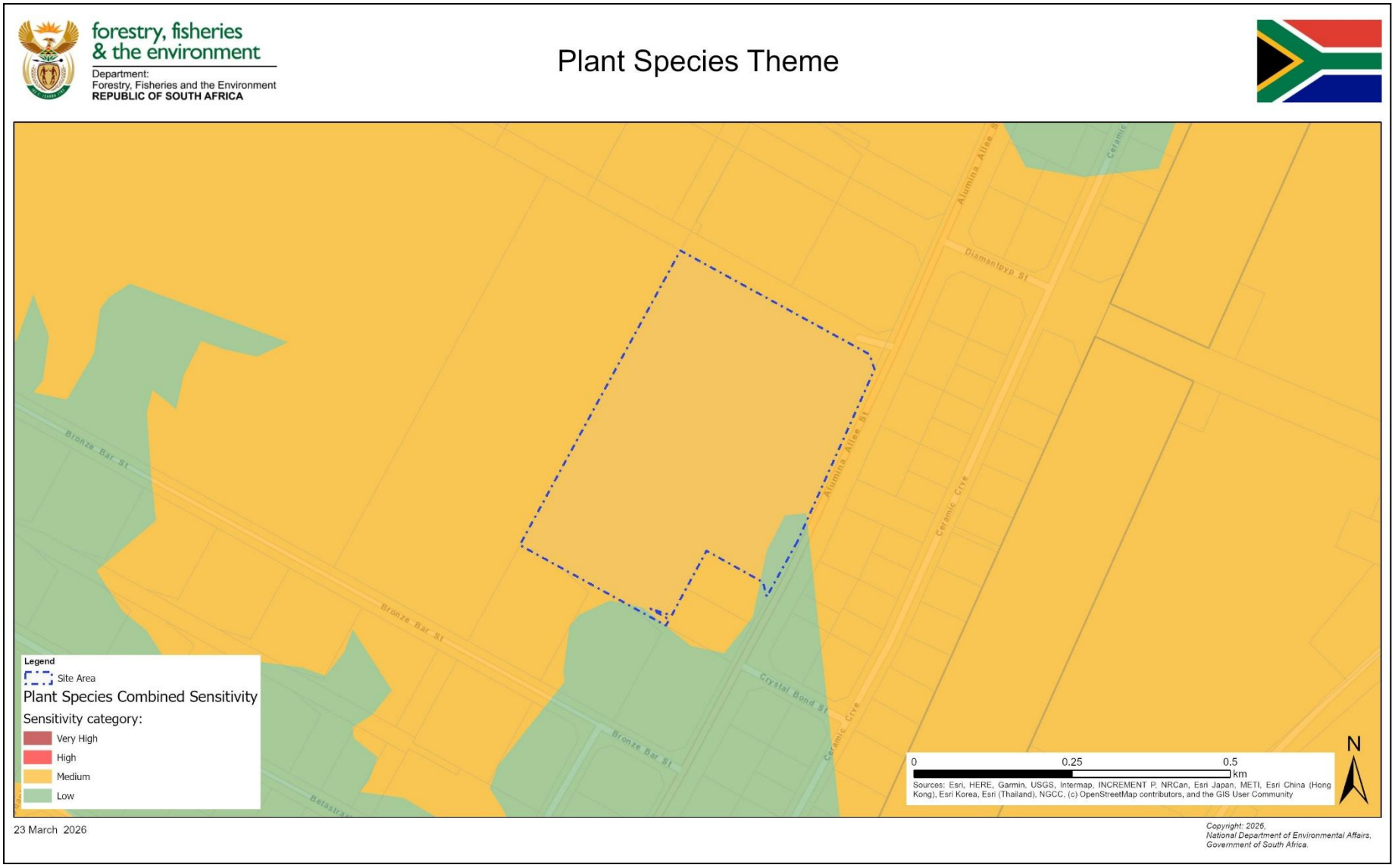


Figure 11: Plant Species Theme sensitivity for the study area as obtained from the Screening Tool (accessed 2026).

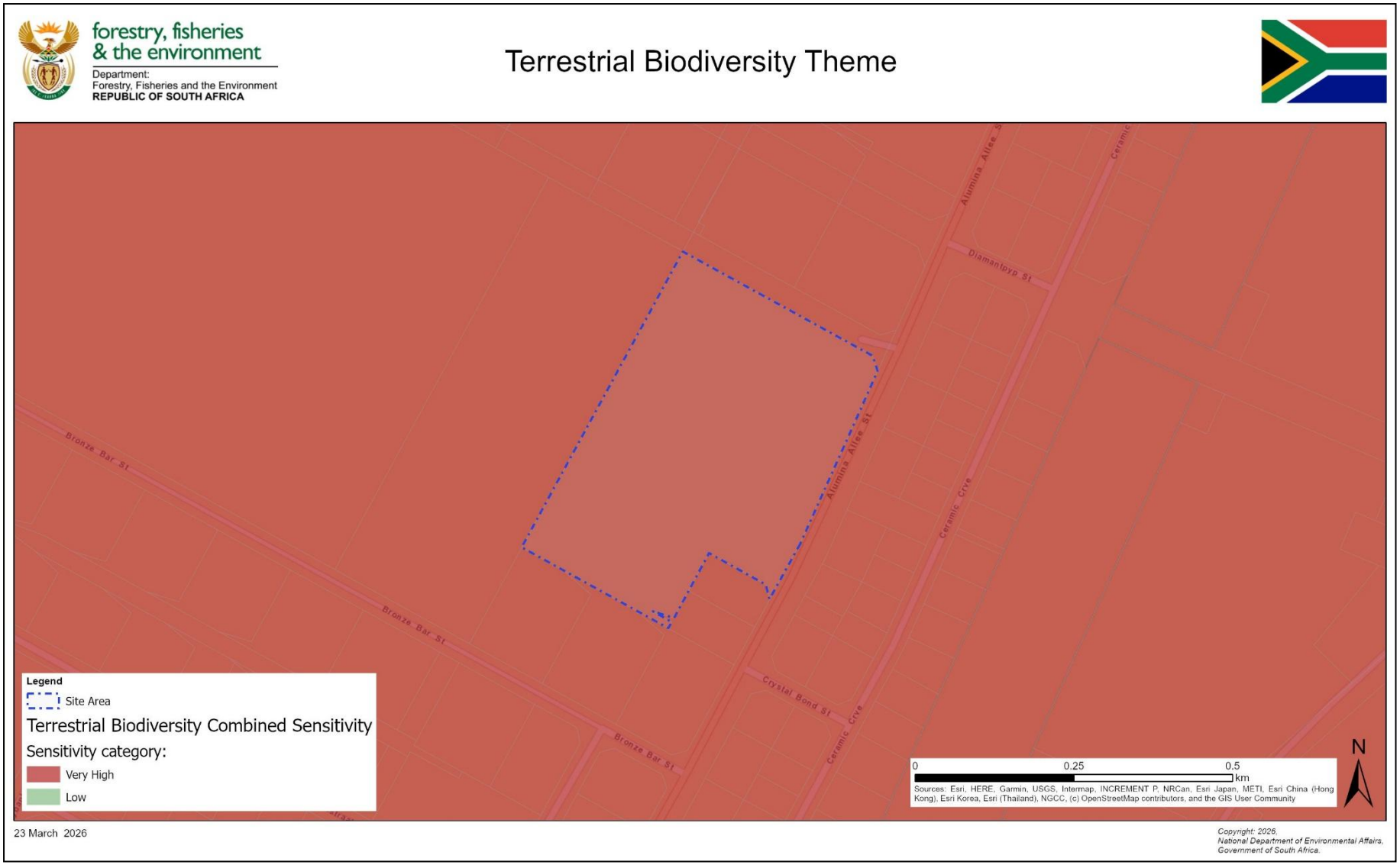


Figure 12: Terrestrial Biodiversity Theme sensitivity for the study area as obtained from the Screening Tool (accessed 2026).

The site sensitivity verification field assessment was undertaken on 13 June 2024. The study area comprises a mosaic of habitat units that have been subjected to varying degrees of anthropogenic disturbance over time, including vegetation clearing, mowing, and surrounding industrial development. Four primary habitat units were identified, namely Degraded Hygrophilous[10] Grassland, Thicket Habitat, Freshwater Habitat (wetland flats and seep systems), and Transformed Habitat.

The Degraded Hygrophilous Grassland represents the dominant habitat unit and is characterised by a relatively homogeneous herbaceous layer with moderate to low species richness, indicative of disturbance. The Thicket Habitat, located in the southern portion of the site, comprises a dense assemblage of woody species but lacks structural complexity associated with intact forest systems and supports a moderately low diversity of species. The Freshwater Habitat, occurring in the eastern and western portions of the study area, is associated with wetland features and supports comparatively higher ecological functionality, although species diversity varies across these systems. The Transformed Habitat, associated with existing road infrastructure, is highly degraded, with negligible ecological function and limited vegetation cover dominated by scattered alien and invasive plant (AIP) species.

AIP species were observed across portions of the study area, particularly within disturbed habitats, although overall abundance was relatively low. Historical and ongoing disturbance, together with surrounding industrial land use and the presence of physical barriers (e.g., fencing), have contributed to habitat fragmentation and reduced ecological connectivity.

From a floral perspective, no threatened species (Red Data Listed or TOPS-listed) or protected tree species (as per the NFA) were recorded during the site assessment. However, suitable habitat is present within the freshwater systems for certain triggered species, and a moderate probability of occurrence (POC) is therefore assigned. A precautionary approach is thus warranted.

Faunal diversity within the study area was generally low relative to expected regional assemblages, likely due to habitat fragmentation and disturbance. Mammal presence was largely limited to common species, with evidence of species such as *Thryonomys swinderianus* (Greater Cane Rat). Avifaunal diversity was highest within the Freshwater and Thicket Habitats, while lower diversity was associated with the Degraded Hygrophilous Grassland and Transformed Habitat. No faunal SCC were confirmed during the assessment, although suitable habitat for certain species may occur within the Freshwater Habitat.

[10] For the purposes of this assessment, hygrophilous refers to vegetation types that are adapted to, and typically occur in, areas of increased soil moisture, seasonal saturation, or proximity to freshwater features. Such habitats are often transitional between terrestrial and aquatic systems and support plant species tolerant of wet or periodically waterlogged conditions.

Herpetofaunal and invertebrate diversity were also considered low to moderate, with seasonal limitations (winter survey) likely influencing detectability.

The very high terrestrial biodiversity sensitivity identified by the Screening Tool is primarily driven by the presence of an irreplaceable CBA, associated with the Maputaland Wooded Grassland ecosystem (EN), as well as Priority Focus Areas identified in the NPAES. Based on field verification, sections of the study area, particularly the Freshwater Habitat, are considered to be representative of this ecosystem, and the CBA designation is therefore confirmed in part to sections of the study area.

Overall, while portions of the study area retain moderate ecological value, particularly within freshwater-associated habitats, the site is characterised by disturbance, fragmentation, and reduced connectivity. As such, the ecological sensitivity is considered to be moderate at a local scale, with higher sensitivity associated with the freshwater components and lower sensitivity associated with transformed and degraded habitats (e.g., Degraded Hygrophilous Grassland and Transformed Habitat). For this reason a thorough biodiversity assessment was undertaken.

Refer to Figure 13 for an indication of the specialist tracks walked during the site assessment and to Figures 14 - 15 for an indication of habitat types and evidence of faunal species activity recorded during the site assessment. Please refer to the separate Terrestrial Verification Report (SAS 24-2034, 2024a) for further details.

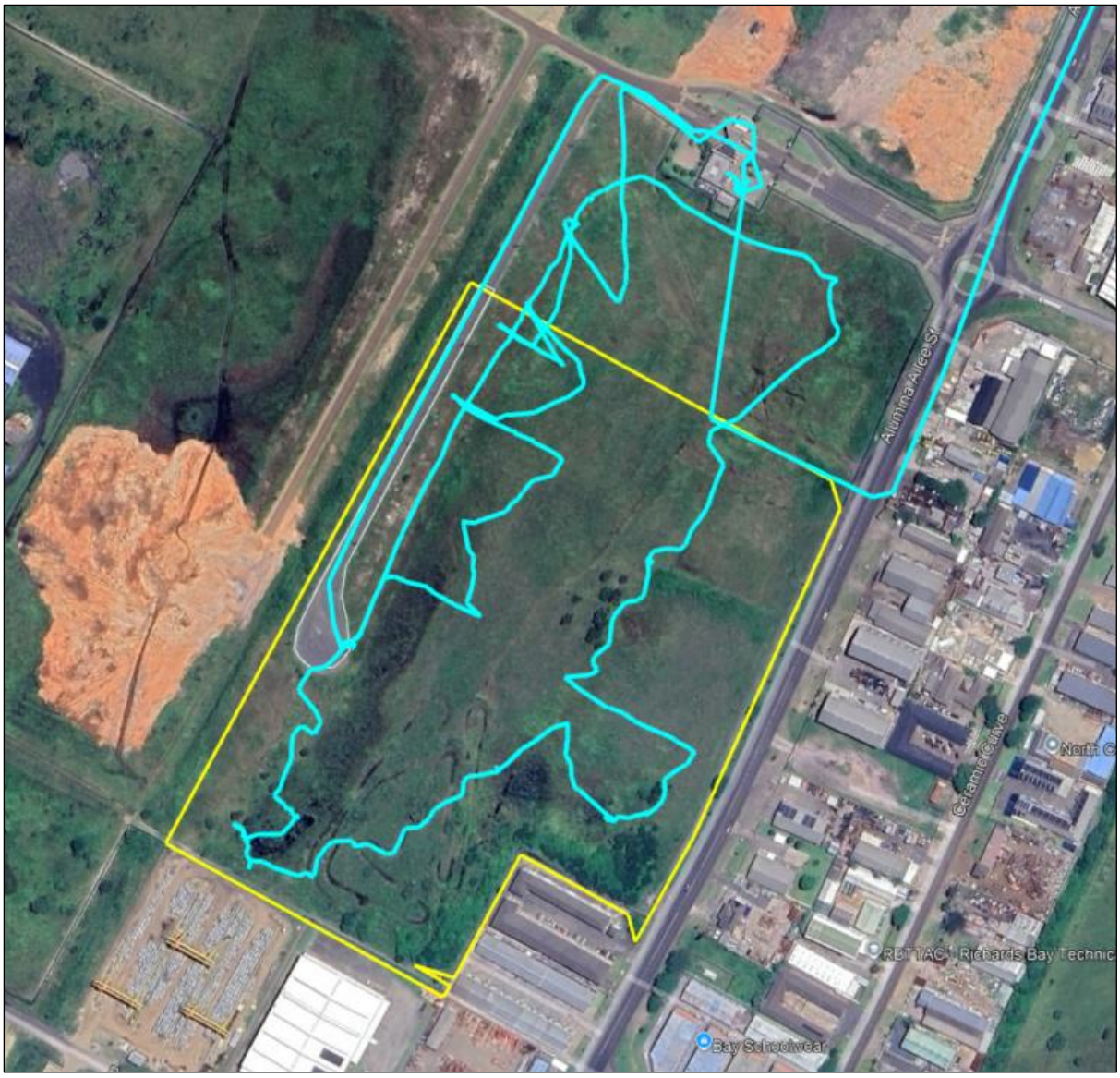


Figure 13: Satellite imagery illustrating the tracks walked by the specialist within the study area (yellow line) during the site assessment in June 2024 (as indicated by the blue line).





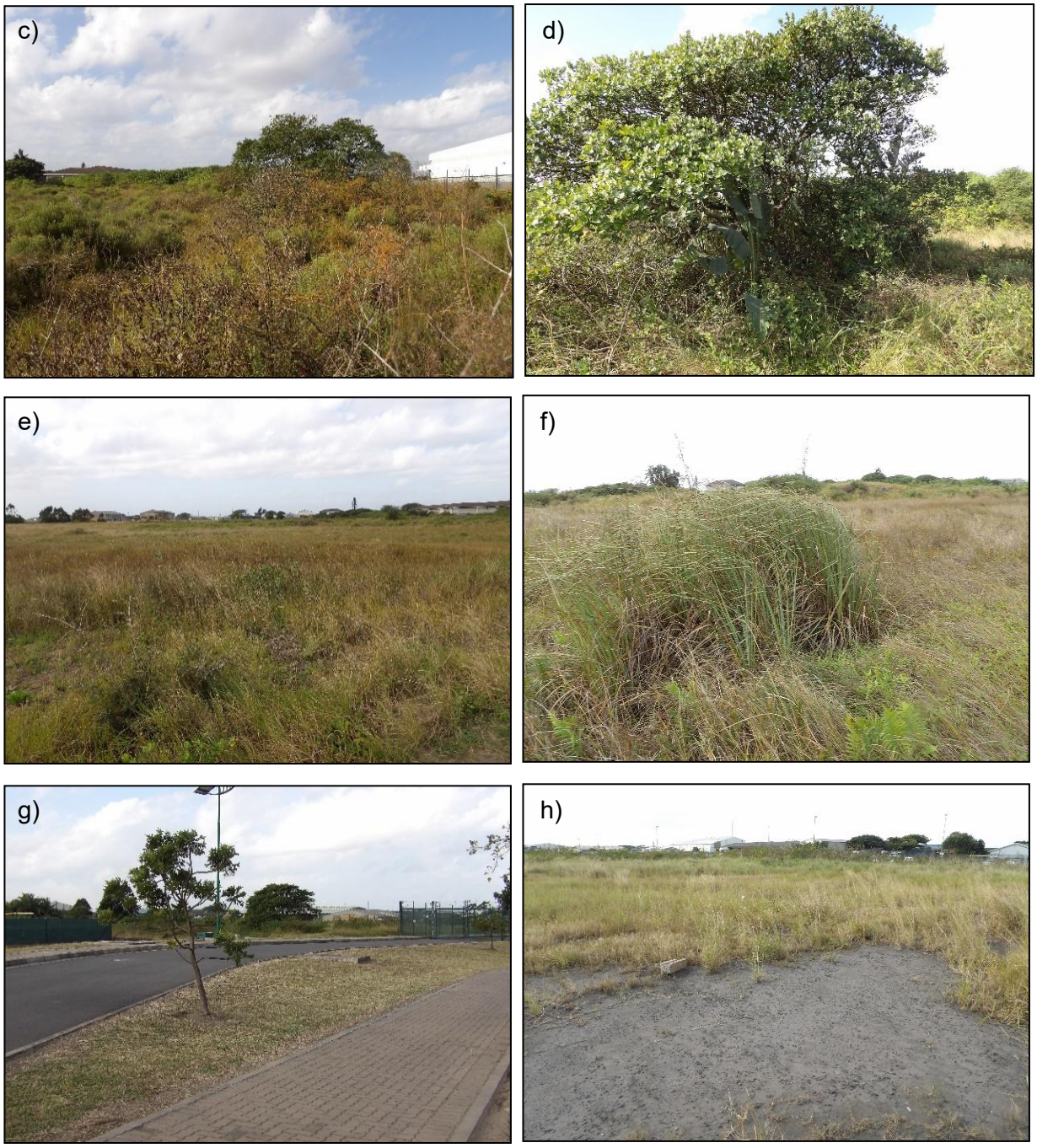


Figure 14: Representative photographs of the habitat types observed within the study area, namely: Hygrophilous Grassland Habitat (a-b), Thicket Habitat (c-d), Freshwater Habitat (e-f) and Transformed Habitat (g-h).



Figure 15: Photographs illustrating evidence of faunal activity within the study area: a) *Thryonomys swinderianus* (Greater Cane Rat) dung, b) *Corvus albus* (Pied crow), and c) Ootheca of a mantis species.

Table 3 presents the site-verified results for the study area compared with the Screening Tool outcomes. It also indicates the required minimum reporting protocols.

Table 3: Specialist comparison with the screening tool sensitivity rating and professional rating. The table further provides the specialist's recommendation for biodiversity reporting.

Environmental Theme and triggers	Applicable Protocol	Response
Animal Species Theme Sensitivity Rating as per the Screening Tool Outcome: The entire study area occurs within a **high sensitivity class** as per the Screening Tool outcome (Figure 10). The triggered species include: **High (i.e., recent occurrence records for threatened and/or rare endemic** ➢ *Circaetus fasciolatus* (Southern Banded Snake Eagle; CR); ➢ *Circus ranivorus* (African Marsh Harrier; EN); ➢ *Geokichla guttata* (Spotted Ground Thrush: EN); ➢ *Podica senegalensis* (African Finfoot: VU); ➢ *Polemaetus bellicosus* (Martial Eagle: EN); and ➢ *Stephanoaetus coronatus* (Crowned Eagle: VU). **Medium (suspected suitable habitat for CR, EN or VU species):** ➢ *Arytropteris basalis* (Flat-necked Shieldback: VU); ➢ *Balearica regulorum* (Grey Crowned Crane: EN); ➢ *Crocodylus niloticus* (Nile Crocodile: VU); ➢ *Halcyon senegaloides* (Mangrove Kingfisher: EN); ➢ *Hyperolius pickersgilli* (Pickersgill's Reed Frog: EN); ➢ *Lycaon pictus* (African Wild Dog; EN); ➢ *Nettapus auratus* (African Pygmy Goose; VU); ➢ *Pelusios rhodesianus* (Variable Hinged Terrapin; VU); ➢ *Pomatonota dregii* (East Coast Katydid; VU); ➢ *Terathopius ecaudatus (Bateleur: EN); and* Sensitive species 8 *(VU).* Ground-truthed Sensitivity: The high sensitivity for the Animal Species Theme was not confirmed for the study area. **Medium sensitivity for the Animal Species Theme is more appropriate** as the preferred habitat for faunal SCC triggered by the Screening Tool is present within the sensitive areas within the study area. Requirement: Terrestrial Animal Species Specialist Assessment.	Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations: ➢ Government Notice (GN) 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species as published in Government Gazette 43855 dated 30 October 2020.	An Animal Species site inspection was conducted by STS. During the site visit, it was determined that large portions of the site had previously been transformed or degraded (refer to Section 4); however, natural (untransformed) vegetation was still present. To verify the presence or absence of the triggered animal species, a further investigation is required within a more suitable season to support and/or guide the authorisation process required in terms of NEMA. A detailed **Animal Species Specialist Assessment report** must be compiled and will outline the faunal habitat and diversity within the study area and provide a motivation for the sensitivities determined and their alignment with the outcomes of the Screening Tool.

Environmental Theme and triggers	Applicable Protocol	Response
Plant Species Theme Sensitivity Rating as per the Screening Tool Outcome: The northern and central sections of study area occur within a **medium sensitivity class** (Figure 11). A small section in the south-eastern section of the study area is in a **low sensitivity class**. Triggered species include: ➢ *Cassipourea g*ummiflua var. *verticillata* (VU); ➢ *Emplectanthus cordatus* (VU); ➢ *Fimbristylis aphylla* (VU); ➢ *Freesia laxa* subsp. *azurea* (VU); ➢ *Nidorella tongensis* (EN); ➢ *Oxygonum dregeanum* subsp. s*treyi* (EN); ➢ *Pachycarpus concolor* subsp. *arenicola* (VU); ➢ *Pavonia dregei* (VU); ➢ *Senecio ngoyanus* (VU); ➢ Sensitive species 89 (VU); ➢ Sensitive species 191 (VU); ➢ Sensitive species 649 (VU); ➢ Sensitive species 1252 (VU); and ➢ *Thesium polygaloides* (VU). Ground-truthed Sensitivity: The **medium sensitivity for the Plant Species Theme was confirmed** for most of the study area, except for disturbed areas, which would more suitably be rated as a low sensitivity area. Requirement: Terrestrial Plant Species Specialist Assessment Report	Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations: ➢ GN 1150 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species as published in Government Gazette 43855 dated 30 October 2020.	A Terrestrial Plant Species site investigation was conducted by STS. During the initial site visit it was determined that most of the site is in a degraded state (refer to Section 4); however, natural (untransformed) vegetation was present, and a detailed study is thus required within a more suitable season (December to February) for detection of the triggered floral species to support and/or guide the authorisation process required in terms of NEMA. The detailed **Terrestrial Plant Species Specialist Assessment report** will outline the habitat and conditions within study area and provide a clear motivation for the medium sensitivity outcome of the screening tool.
Terrestrial Biodiversity Theme Sensitivity Rating as per the Screening Tool Outcome: The entire extent of study area is within a **very high sensitivity area** according to the Terrestrial Biodiversity Theme outcome of the Screening Tool (Figure 12). Triggered biodiversity features include the EN Maputaland Wooded Grassland threatened ecosystem, a CBA: Irreplaceable, as well as sections of Priority Focus Areas as per the NPAES.	Government Gazette 45421 dated 10 May 2019 as it relates to the DFFE's national environmental screening report required with an application for environmental authorisation as identified in regulation 16(1)(v) of EIA Regulations: ➢ GN 320 Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity	A Terrestrial Biodiversity site inspection was conducted by STS. During the initial site visit it was determined that several historic and current pressures on the vegetation within the study area were present (refer to Section 4); however, some sections of seemingly intact vegetation remained. As such, a detailed site assessment of all terrestrial biodiversity aspects is required within a more suitable season to support and/or guide the authorisation process required in terms of NEMA.

Environmental Theme and triggers	Applicable Protocol	Response
Ground-truthed Sensitivity: The **very high sensitivity was not confirmed** for the study area as no "pure" form of the EN Maputaland Wooded Grassland threatened ecosystem and remains on site. **Small sections of CBA-irreplaceable are still present** within the Freshwater Ecosystems where Ecological processes are still functioning. The study area still functions as a migratory corridor for birds, but the fence line present within the study area prevents the migration of mammals and reptiles. Requirement: Terrestrial Biodiversity Specialist Assessment	as published in Government Gazette 43110 dated 20 March 2020.	The detailed **Terrestrial Biodiversity Specialist Assessment report** will outline the habitat and ecological drivers (or lack thereof) within the study area and provide clear motivations for disputing or verifying the very high sensitivity outcome of the screening tool.

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APPENDIX A: Indemnity and Terms of Use of this Report

The findings, results, observations, conclusions, and recommendations given in this report are based on the author's best scientific and professional knowledge as well as available information. The report is based on survey and assessment techniques which are limited by time and budgetary constraints relevant to the type and level of investigation undertaken and STS (Pty) Ltd. and its staff reserve the right to, at their sole discretion, modify aspects of the report including the recommendations if and when new information may become available from ongoing research or further work in this field, or pertaining to this investigation.

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APPENDIX B: Legislative Requirements

THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996

The environment and the health and well-being of people are safeguarded under the Constitution of the Republic of South Africa, 1996 by way of Section 24. Section 24(a) guarantees a right to an environment that is not harmful to human health or well-being and to environmental protection for the benefit of present and future generations. Section 24(b) directs the state to take reasonable legislative and other measures to prevent pollution, promote conservation, and secure the ecologically sustainable development and use of natural resources (including water and mineral resources) while promoting justifiable economic and social development. Section 27 guarantees every person the right of access to sufficient water, and the state is obliged to take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right. Section 27 is defined as a socio-economic right and not an environmental right. However, read with Section 24 it requires of the state to ensure that water is conserved and protected and that sufficient access to the resource is provided. Water regulation in South Africa places a great emphasis on protecting the resource and on providing access to water for everyone.

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA)

The National Environmental Management Act, 1998 (Act No.107 of 1998) (NEMA) and the associated Environmental Impact Assessment (EIA) Regulations (GN R326 as amended in 2017 and well as listing notices 1, 2 and 3 (GN R327, R325 and R324 of 2017), state that prior to any development taking place which triggers any activity as listed within the abovementioned regulations, an environmental authorisation process needs to be followed and environmental authorisation obtained. This could follow either the Basic Assessment process or the Environmental Impact Assessment process depending on the nature of the activity and scale of the anticipated impacts.

THE NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004) (NEMBA)

The objectives of this act are (within the framework of NEMA) to provide for:

- The management and conservation of biological diversity within the Republic of South Africa and of the components of such diversity;
- The use of indigenous biological resources in a sustainable manner;
- The fair and equitable sharing among stakeholders of the benefits arising from bio prospecting involving indigenous biological resources;
- To give effect to ratify international agreements relating to biodiversity which are binding to the Republic;
- To provide for cooperative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

This act alludes to the fact that management of biodiversity must take place to ensure that the biodiversity of the surrounding areas are not negatively impacted upon, by any activity being undertaken, in order to ensure the fair and equitable sharing among stakeholders of the benefits arising from indigenous biological resources.

Furthermore, a person may not carry out a restricted activity involving either:

a) A specimen of a listed threatened or protected species;
b) Specimens of an alien species; or
c) A specimen of a listed invasive species without a permit.

GOVERNMENT NOTICE NUMBER R.1020: ALIEN AND INVASIVE SPECIES REGULATIONS, 2020 (IN GOVERNMENT GAZETTE 43735), INCLUDING GOVERNMENT NOTICE NUMBER 1003: ALIEN AND INVASIVE SPECIES LISTS, 2020 (IN GOVERNMENT GAZETTE 43726) AS IT RELATES TO THE NEMBA

NEMBA is administered by the Department of Environmental Affairs and aims to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of alien and invasive species. This act in terms of alien and invasive species aims to:

- Prevent the unauthorized introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur,
- Manage and control alien and invasive species, to prevent or minimize harm to the environment and biodiversity; and
- Eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Alien species are defined, in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004) as:

(a) A species that is not an indigenous species; or
(b) An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

Categories according to NEMBA (Alien and Invasive Species Regulations, 2020):

- **Category 1a:** Invasive species that require compulsory control;
- **Category 1b:** Invasive species that require control by means of an invasive species management programme;
- **Category 2:** Commercially used plants that may be grown in demarcated areas, provided that there is a permit and that steps are taken to prevent their spread; and
- **Category 3:** Ornamentally used plants that may no longer be planted.

NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT, 2003 (ACT NO. 57 OF 2003) AS AMENDED[11] (NEMPAA)

The objective of this act is to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection thereof.

[11] Amendments to the NEMPAA:

- National Environmental Management: Protected Areas Amendment Act 31 of 2004 – Gazette No. 27274, No. 131. Commencement date: 1 November 2005 [Proc. No. R. 58, Gazette No, 28123]
- National Environment Laws Amendment Act 14 of 2009 – Gazette No.32267, No. 617. Commencement date: 18 September 2009 [Proc. 65, Gazette No. 32580]
- National Environmental Management: Protected Areas Amendment Act 15 of 2009 – Gazette No. 32660, No. 748. Commencement date: 23 October 2009 – except for sections 1 and 8 [Proc. No. 69, Gazette No. 32660]
- Schedule 2 amended by Government Notice R236 in Government Gazette 36295 dated 27 March 2013. Commencement date: 1 April 2013 of sections 1 and 8 (relating to Schedule 2) of the National Environmental Management Protected Areas Amendment Act, 15 of 2009 [Proc. No. 7, Gazette No. 36296]
- National Environmental Management: Protected Areas Amendment Act 21 of 2014 - Government Notice 445 in Government Gazette 37710 dated 2 June 2014. Commencement date: 2 June 2014.
- Schedule 2 amendment by General Notice 2 of 2016 in Government Gazette 39728 dated 25 February 2016. Commencement date: 25 February 2016.

THE CONSERVATION OF AGRICULTURAL RESOURCES ACT, 1983 (ACT NO. 43 OF 1983) (CARA)

Removal of the alien and weed species encountered in the application area must take place in order to comply with existing legislation (amendments to the regulations under the CARA, 1983 and Section 28 of the NEMA, 1998). Removal of AIP and weed species should take place throughout the construction and operation, phases in line with an approved AIP Management Plan.

NATIONAL WATER ACT OF SOUTH AFRICA (ACT NO. 36 OF 1998)

The National Water Act of South Africa (1998) is the main law governing how water is managed and protected in South Africa. It declares that water is a national resource owned by the state, to be managed for the benefit of all people. The Act prioritizes basic human needs and environmental protection, requires licenses for most water use, promotes equitable access, and aims for sustainable, efficient, and integrated water management to address past inequalities and ensure long-term water security.

THE KWAZULU-NATAL NATURE CONSERVATION MANAGEMENT AMENDMENT ACT, 1999 (ACT NO. 5 OF 1999) (NCMAA)

The KwaZulu-Natal Nature Conservation Management Amendment Act 15 of 1999 provides for the protection of indigenous plants. Subject to the provisions of this Act, with regards to Specially protected indigenous plants, no person shall:

- Gather, export, import, introduce, purchase, sell, relocate or translocate a specially protected indigenous plant except under the authority of a permit issued by the Conservation Service and in accordance with any special protective measure under section 63

In terms of Protected Indigenous plants no person may;

- Gather a protected indigenous plant growing in the wilds; or
- Convey, export or sell a protected indigenous plant, except under the authority of a permit issued by the Conservation Service and in accordance with any special protective measures under section 63; and
- A person may only purchase a protected indigenous plant from a person who is legally entitled to sell the plant.

The below schedules were applicable for the floral and faunal assessments (Part B and C):

- Schedule 5: Protected Indigenous Animals;
- Schedule 6: Specially Protected Indigenous Plants; and
- Schedule 7: Protected Indigenous Plants.

APPENDIX C: Impact Assessment Methodology

For the Environmental Assessment Practitioner (EAP) to allow for sufficient consideration of all environmental impacts, impacts must assess using a common, defensible method of assessing significance that will enable comparisons to be made between risks/impacts and will enable authorities, stakeholders and the client to understand the process and rationale upon which risks/impacts have been assessed. The method to be used for assessing risks/impacts is outlined in the sections below.
The first stage of risk/impact assessment is the identification of environmental activities, aspects, and impacts. This is supported by the identification of receptors and resources, which allows for an understanding of the impact pathway and an assessment of the sensitivity to change. The definitions used in the impact assessment are presented below.

- An **activity** is a distinct process or task undertaken by an organisation for which a responsibility can be assigned. Activities also include facilities or infrastructure that is possessed by an organisation.
- An **environmental aspect** is an 'element of an organizations activities, products and services which can interact with the environment'[12]. The interaction of an aspect with the environment may result in an impact.
- **Environmental risks/impacts** are the consequences of these aspects on environmental resources or receptors of particular value or sensitivity, for example, disturbance due to noise and health effects due to poorer air quality. In the case where the impact is on human health or wellbeing, this should be stated. Similarly, where the receptor is not anthropogenic, then it should, where possible, be stipulated what the receptor is.
- **Receptors** can comprise, but are not limited to, people or human-made systems, such as local residents, communities and social infrastructure, as well as components of the biophysical environment such as wetlands, flora and riverine systems.
- **Resources** include components of the biophysical environment.
- **Frequency of activity** refers to how often the proposed activity will take place.
- **Frequency of impact** refers to the frequency with which a stressor (aspect) will impact on the receptor.
- **Severity** refers to the degree of change to the receptor status in terms of the reversibility of the impact; sensitivity of receptor to stressor; duration of impact (increasing or decreasing with time); controversy potential and precedent setting; threat to environmental and health standards.
- **Spatial extent** refers to the geographical scale of the impact.
- **Duration** refers to the length of time over which the stressor will cause a change in the resource or receptor.

The significance of the impact is then assessed by rating each variable numerically according to the defined criteria. Refer to the Table D1-2. The purpose of the rating is to develop a clear understanding of influences and processes associated with each impact. The severity, spatial scope and duration of the impact together comprise the consequence of the impact and when summed can obtain a maximum value of 15. The frequency of the activity and the frequency of the impact together comprise the likelihood of the impact occurring and can obtain a maximum value of 10. The values for likelihood and consequence of the impact are then read off a significance-rating matrix and are used to determine whether mitigation is necessary[13].

The assessment of significance is undertaken twice. Initial, significance is based on only natural and existing mitigation measures (including built-in engineering designs). The subsequent assessment considers the recommended management measures required to mitigate the impacts. Measures such as demolishing infrastructure, and reinstatement and rehabilitation of land, are considered post-mitigation.

[12] The definition has been aligned with that used in the ISO 14001 Standard.

[13] Some risks/impacts that have low significance will however still require mitigation.

The model outcome of the impacts was then assessed in terms of impact certainty and consideration of available information. The Precautionary Principle is applied in line with South Africa's National Environmental Management Act, 1998 (Act No. 107 of 1998) in instances of uncertainty or lack of information, by increasing assigned ratings or adjusting final model outcomes. In certain instances, where a variable or outcome requires rational adjustment due to model limitations, the model outcomes have been adjusted.

Table C1: Criteria for assessing significance of impacts.

LIKELIHOOD DESCRIPTORS

Probability of impact	**RATING**
Highly unlikely	1
Possible	2
Likely	3
Highly likely	4
Definite	5
Sensitivity of receiving environment	**RATING**
Ecology not sensitive/important	1
Ecology with limited sensitivity/importance	2
Ecology moderately sensitive/ /important	3
Ecology highly sensitive /important	4
Ecology critically sensitive /important	5

CONSEQUENCE DESCRIPTORS

Severity of impact	**RATING**
Insignificant / ecosystem structure and function unchanged	1
Small / ecosystem structure and function largely unchanged	2
Significant / ecosystem structure and function moderately altered	3
Great / harmful/ ecosystem structure and function largely altered	4
Disastrous / ecosystem structure and function seriously to critically altered	5
Spatial scope of impact	**RATING**
Activity specific/ < 5 ha impacted / Linear developments affected < 100m	1
Development specific/ within the site boundary / < 100ha impacted / Linear developments affected < 100m	2
Local area/ within 1 km of the site boundary / < 500ha impacted / Linear developments affected > 100m	3
Regional within 5 km of the site boundary / < 2000ha impacted / Linear developments affected < 3000m	4
Entire habitat unit / Entire system/ > 2000ha impacted / Linear developments affected > 3000m	5
Duration of impact	**RATING**
One day to one month	1
One month to one year	2
One year to five years	3
Life of operation or less than 20 years	4
Permanent	5

Table C2: Significance Rating Matrix.

LIKELIHOOD (Frequency of activity + Frequency of impact)	CONSEQUENCE (Severity + Spatial Scope + Duration)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30
	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60
	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75
	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
	7	14	21	28	35	42	49	56	63	70	77	84	91	98	105
	8	16	24	32	40	48	56	64	72	80	88	96	104	112	120
	9	18	27	36	45	54	63	72	81	90	99	108	117	126	135
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150

Table C3: Positive/Negative Mitigation Ratings.

Significance Rating	Value	Negative Impact Management Recommendation	Positive Impact Management Recommendation
Very high	126-150	Critically consider the viability of proposed projects Improve current management of existing projects significantly and immediately	Maintain current management
High	101-125	Comprehensively consider the viability of proposed projects Improve current management of existing projects significantly	Maintain current management
Medium-high	76-100	Consider the viability of proposed projects. Improve current management of existing projects	Maintain current management
Medium-low	51-75	Actively seek mechanisms to minimise impacts in line with the mitigation hierarchy	Maintain current management and/or proposed project criteria and strive for continuous improvement
Low	26-50	Where deemed necessary seek mechanisms to minimise impacts in line with the mitigation hierarchy	Maintain current management and/or proposed project criteria and strive for continuous improvement
Very low	1-25	Maintain current management and/or proposed project criteria and strive for continuous improvement	Maintain current management and/or proposed project criteria and strive for continuous improvement

The following points were considered when undertaking the assessment:

- Risks and impacts were analysed in the context of the *project's area of influence* encompassing:
  - Primary project site and related facilities that the client and its contractors develop or controls;
  - Areas potentially impacted by cumulative impacts for any existing project or condition and other project-related developments; and
  - Areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location.
- Risks/Impacts were assessed for all stages of the project cycle including:
  - Construction; and
  - Operation.
- If applicable, transboundary, or global effects were assessed.
- Individuals or groups who may be differentially or disproportionately affected by the project because of their *disadvantaged* or *vulnerable* status were assessed.
- Particular attention was paid to describing any residual impacts that will occur after rehabilitation.

Mitigation measure development

According to the DEA *et al.,* (2013) "Rich biodiversity underpins the diverse ecosystems that deliver ecosystem services that are of benefit to people, including the provision of basic services and goods such as clean air, water, food, medicine, and fibre; as well as more complex services that regulate and mitigate our climate, protect people and other life forms from natural disaster and provide people with a rich heritage of nature-based cultural traditions. Intact ecological infrastructure contributes significant savings through, for example, the regulation of natural hazards such as storm surges and flooding which is attenuated by wetlands".

According to the DEA *et al.,* (2013) ecosystem services can be divided into 4 main categories:

- Provisioning services are the harvestable goods or products obtained from ecosystems such as food, timber, fibre, medicine, and fresh water;
- Cultural services are the non-material benefits such as heritage landscapes and seascapes, recreation, ecotourism, spiritual values and aesthetic enjoyment;
- Regulating services are the benefits obtained from an ecosystem's control of natural processes, such as climate, disease, erosion, water flows, and pollination, as well as protection from natural hazards; and
- Supporting services are the natural processes such as nutrient cycling, soil formation and primary production that maintain the other services.

Loss of biodiversity puts aspects of the economy, wellbeing, and quality of life at risk, and reduces socio-economic options for future generations. This is of particular concern for the poor in rural areas who have limited assets and are more dependent on common property resources for their livelihoods. The importance of maintaining biodiversity and intact ecosystems for ensuring on-going provision of ecosystem services, and the consequences of ecosystem change for human well-being, were detailed in a global assessment entitled the Millennium Ecosystem Assessment (MEA, 2005), which established a scientific basis for the need for action to enhance management and conservation of biodiversity.

Sustainable development is enshrined in South Africa's Constitution and laws. The need to sustain biodiversity is directly or indirectly referred to in several Acts, not least the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (hereafter referred to as the Biodiversity Act) and is fundamental to the notion of sustainable development. In addition, international guidelines, and commitments as well as national policies and strategies are important in creating a shared vision for sustainable development in South Africa (DEA *et al.,* 2013).

The primary environmental objective of the Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) is to give effect to the environmental right contained in the South African Constitution. Furthermore, Section 37(2) of the MPRDA states that "any prospecting or mining operation must be conducted in accordance with generally accepted principles of sustainable development by integrating social, economic and environmental factors into the planning and implementation of prospecting and mining projects in order to ensure that exploitation of mineral resources serves present and future generations".

Pressures on biodiversity are numerous and increasing. According to the DEA *et al.,* (2013) Loss of natural habitat is the single biggest cause of biodiversity loss in South Africa and much of the world. The most severe transformation of habitat arises from the direct conversion of natural habitat for human requirements, including[14]:

- Cultivation and grazing activities;
- Rural and urban development;
- Industrial and mining activities, and
- Infrastructure development.

[14] Limpopo Province Environment Outlook. A Report on the State of the Environment, 2002. Chapter 4.

Impacts on biodiversity can largely take place in four ways (DEA *et al.,* 2013):

- **Direct impacts:** are impacts directly related to the project including project aspects such as site clearing, water abstraction and discharge of water from riverine resources;
- **Indirect impacts:** are impacts associated with a project that may occur within the zone of influence in a project such as surrounding terrestrial areas and downstream areas on water courses;
- **Induced impacts:** are impacts directly attributable to the project but are expected to occur due to the activities of the project. Factors included here are urban sprawl and the development of associated industries; and
- **Cumulative impacts:** can be defined as the sum of the impact of a project as well as the impacts from past, existing, and reasonably foreseeable future projects that would affect the same biodiversity resources. Examples include numerous mining operations within the same drainage catchment or numerous residential developments within the same habitat for faunal or floral species.

Given the limited resources available for biodiversity management and conservation, as well as the need for development, efforts to conserve biodiversity need to be strategic, focused, and supportive of sustainable development. This is a fundamental principle underpinning South Africa's approach to the management and conservation of its biodiversity and has resulted the definition of a clear mitigation strategy for biodiversity impacts.

'Mitigation' is a broad term that covers all components of the 'mitigation hierarchy' defined hereunder. It involves selecting and implementing measures – amongst others – to conserve biodiversity and to protect the users of biodiversity and other affected stakeholders from potentially adverse impacts because of mining or any other land use. The aim is to prevent adverse impacts from occurring or, where this is unavoidable, to limit their significance to an acceptable level. Offsetting of impacts is the last option in the mitigation hierarchy for any project.

The mitigation hierarchy in general consists of the following in order of which impacts should be mitigated (DEA *et al.,* 2013):

- **Avoid/prevent impact:** can be done through utilising alternative sites, technology, and scale of projects to prevent impacts. In some cases, if impacts are expected to be too high the "no project" option should also be considered, especially where it is expected that the lower levels of mitigation will not be adequate to limit environmental damage and eco-service provision to suitable levels;
- **Minimise impact:** can be done through utilisation of alternatives that will ensure that impacts on biodiversity and ecoservices provision are reduced. Impact minimisation is considered an essential part of any development project;
- **Rehabilitate impact:** is applicable to areas where impact avoidance and minimisation are unavoidable where an attempt to re-instate impacted areas and return them to conditions which are ecologically similar to the pre-project condition or an agreed post project land use, for example arable land. Rehabilitation can however not be considered as the primary mitigation tool as even with significant resources and effort rehabilitation usually does not lead to adequate replication of the diversity and complexity of the natural system. Rehabilitation often only restores ecological function to some degree to avoid ongoing negative impacts and to minimise aesthetic damage to the setting of a project. Practical rehabilitation should consist of the following phases in best practice:
  - **Structural rehabilitation** which includes physical rehabilitation of areas by means of earthworks, potential stabilisation of areas as well as any other activities required to develop a long terms sustainable ecological structure;
  - **Functional rehabilitation** which focuses on ensuring that the ecological functionality of the ecological resources on the focus area supports the intended post closure land use. In this regard special mention is made of the need to ensure the continued functioning and integrity of wetland and riverine areas throughout and after the rehabilitation phase;
  - **Biodiversity reinstatement** which focuses on ensuring that a reasonable level of biodiversity is re-instated to a level that supports the local post closure land uses. In this regard special mention is made of re-instating vegetation to levels which will allow the natural climax vegetation community or community suitable for supporting the intended post closure land use; and

- **Species reinstatement** which focuses on the re-introduction of any ecologically important species which may be important for socio-cultural reasons, ecosystem functioning reasons and for conservation reasons. Species re-instatement need only occur if deemed necessary.

➢ **Offset impact:** refers to compensating for residual or unavoidable negative impacts on biodiversity. Offsetting should take place to address any impacts deemed to be unacceptable which cannot be mitigated through the other mechanisms in the mitigation hierarchy. The objective of biodiversity offsets should be to ensure no net loss of biodiversity. Biodiversity offsets can be a last resort to compensate for residual negative impacts on biodiversity.

The significance of residual impacts should be identified on a regional as well as national scale when considering biodiversity conservation initiatives. If the residual impacts lead to irreversible loss or irreplaceable biodiversity the residual impacts should be of *very high significance* and when residual impacts are of *very high significance*, offset initiatives are not considered an appropriate way to deal with the magnitude and/or significance of the biodiversity loss. In the case of residual impacts determined to have *medium to high significance*, an offset initiative may be investigated. If the residual biodiversity impacts are considered of low significance no biodiversity offset is required.[15]

Considering the above discussion, the following points present the key concepts considered in the development of mitigation measures for the proposed project:

➢ Mitigation and performance improvement measures and actions that address the risks and impacts[16] are identified and described in as much detail as possible;
➢ Measures and actions to address negative impacts will favour avoidance and prevention over minimisation, mitigation, or compensation where possible; and

Desired outcomes are defined and have been developed in such a way as to be measurable events with performance indicators, targets and acceptable criteria that can be tracked over defined periods, with estimates of the resources (including human resource and training requirements) and responsibilities for implementation wherever possible.

Recommendations

Recommendations were developed to address and mitigate impacts associated with the proposed development. These recommendations also include general management measures which apply to the proposed development. Mitigation measures have been developed to address issues in all phases throughout the life of the operation from planning, through to construction, operation, and decommissioning.

[15] Provincial Guideline on Biodiversity Offsets, Western Cape, 2007.
[16] Mitigation measures should address both positive and negative impacts.

APPENDIX D: Reference Vegetation Type

Maputaland Wooded Grassland (CB 2)



Figure E1: Maputaland Wooded Grassland: Wooded grassland in Maputaland (northern KwaZulu-Natal) with prominent (silvery leaves) undescribed species of geoxylic suffrutex (*Ozoroa* sp. Nov.) as depicted in Mucina and Rutherford (2006) page 577. Photo taken my W.S. Mathews.

Table D1: Dominant & typical floristic species of the Maputaland Wooded Grassland (Mucina & Rutherford, 2006). Information taken from Mucina & Rutherford 2006, page 577.

WOODY LAYER	
Small Trees & Tall Shrubs	*Acridocarpus natalitius* var. *linearifolius*, *Dichrostachys cinerea* subsp. *nyassana*, *Diospyros lycioides* subsp. *sericea*, *Hyphaene coriacea*, *Terminalia sericea, Grewia microthyrsa*[S].
Low Shrubs	*Helichrysum kraussii* (d), *Agathisanthemum bojeri*, *Crotalaria monteiroi* var. *monteiroi*.
Geoxylic Suffrutices	*Parinari curatellifolia* (d), *Salacia kraussii* (d), *Ancylobotrys petersiana*, *Diospyros galpinii*, *Eugenia capensis*[#], *Syzygium cordatum*[#], *Eugenia albanensis*[C], *Gymnosporia markwardii*[M].
Woody Climbers	*Albertisia delagoensis*[S], *Cissampelos hirta*[S].
FORB LAYER	
Herbs	*Chamaecrista plumosa, Helichrysopsis septentrionale*[M], *Oxygonum robustum*[M], *Tricliceras mossambicense*[M].
Geophytic Herb	*Cyrtanthus galpinii*.
GRASS LAYER	
Graminoids	*Diheteropogon amplectens* (d), *Themeda triandra* (d), *Aristida stipitata* subsp. *raciliflora*, *Bewsia biflora*, *Cyperus obtusiflorus*, *C. tenax*, *Digitaria natalensis*, *Eustachya paspaloides*, *Setaria sphacelata*, *Sporobolus fimbriatus*, *S. subulatus*, *Urelytrum agropyroides, Abildgaardia hygrophila*[C], *Cyperus natalensis*[C].
Biogeographically Important Taxon (Bushmanland endemic)	
Geoxylic Suffrutices	*Ochna* sp., *Syzygium cordatum.*
Succulent Herb	*Aloe* sp.
Geophytic Herb	*Brachystelma vahrmeijeri*

*(d) = dominant, [#] = Suffrutex Form, [C] = Coastal Belt Element, [M] = Maputaland Endemic, [S] = Southern distribution limit.

APPENDIX E: Details, Expertise and Curriculum Vitae of Specialists

1. (a) (i) Details of the specialist who prepared the report

Candice Lamb	MSc Zoology (University of Pretoria)
Charne Kock	MSc Plant Science (University of Pretoria)
Jandre Potgieter	BSc (Hons) Entomology (University of Pretoria)
Justin Jacobs	BSc (Hons) Entomology (University of Pretoria)
Samantha Leigh Daniels	PhD (Plant Science) (University of Pretoria)
Stephen van Staden	MSc (Environmental Management) (University of Johannesburg)

1. (A). (ii) The expertise of that specialist to compile a specialist report including a curriculum vitae

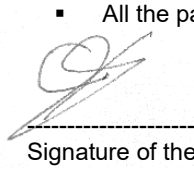
Company of Specialists	**Scientific Terrestrial Services (Pty) Ltd.**
Postal address:	PO. Box 751779, Gardenview
Postal code:	2047
Telephone:	011 616 7893
Name / Contact person:	**Candice Lamb**
E-mail:	candice@sasenvgroup.co.za
Qualifications	MSc Zoology (University of Pretoria) BSc (Hons) Zoology (University of Pretoria) BSc Environmental Science (University of Pretoria)
Registration / Associations	A candidate member of the South African Council for Natural Scientific Professions (SACNASP).
Name / Contact person:	**Charne Gouws**
E-mail:	charne@sasenvgroup.co.za
Qualifications	MSc (Plant Science) (University of Pretoria) BSc (Hons) Plant Science (University of Pretoria) BSc (Environmental Sciences) (University of Pretoria)
Registration / Associations	SANAP (South African National Antarctic Programme) Golden Key Honorary Society Member of the Botanical Society of South Africa (BotSoc) Member of the Land Rehabilitation Society of Southern Africa (LARSSA) Member of the South African Association of Botanists (SAAB) Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP – Reg No. 169998)
Name / Contact person:	**Jandre Potgieter**
E-mail:	jandre@sasenvgroup.co.za
Qualifications	BSc (Hons) Entomology (University of Pretoria) BSc Entomology (University of Pretoria)
Registration / Associations	Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP)
Name / Contact person:	**Justin Jacobs**
E-mail:	justin@sasenvgroup.co.za
Qualifications	BSc (Hons) Biological Sciences (University of Cape Town) BSc Zoology (University of Pretoria)
Name / Contact person:	**Samantha-Leigh Daniels**
E-mail:	samantha@sasenvgroup.co.za
Qualifications	PhD (Plant Science) (University of Pretoria) MSc (Plant Science) (University of Pretoria) BSc (Hons) Zoology & Entomology (University of Pretoria) BSc Zoology & Entomology (University of Pretoria)
Registration / Associations	Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP) Member of the South African Association of Botanists (SAAB) Member of the Botanical Society of South Africa (BotSoc)

	Member of the Land Rehabilitation Society of Southern Africa (LARSSA)
Name / Contact person:	**Stephen van Staden**
E-mail:	stephen@sasenvgroup.co.za
Qualifications	MSc (Environmental Management) (University of Johannesburg) BScHons (Zoology: Aquatic Ecology) (University of Johannesburg) BSc (Zoology, Geography and Environmental Management) (University of Johannesburg)
Registration / Associations	Registered Professional Natural Scientist at South African Council for Natural Scientific Professions (SACNASP) Accredited River Health Practitioner by the South African River Health Program (RHP) Member of the South African Soil Surveyors Association (SASSO) Member of the Gauteng Wetland Forum

1. (b) a declaration that the specialist is independent in a form as may be specified by the competent authority

I, Candice Lamb, declare that -

- I act as the **independent GIS 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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



Signature of the Specialist

I, Charne Kock, declare that -

- I act as the **independent specialist (floral reviewer)** 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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.



Specialist Signature

I, Justin Jacobs, declare that -

- I act as the **independent specialist (faunal)** 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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



Signature of the Specialist

I, Jandre Potgieter, declare that -

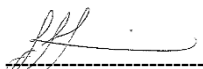
- I act as the **independent specialist (faunal reviewer)** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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



Signature of the Specialist

I, Samatha- Leigh Daniels, declare that -

- I act as the **independent specialist (floral)** 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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



Signature of the Specialist

I, Stephen van Staden, declare that -

- I act as the **independent specialist (reviewer)** 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 relevant legislation and any guidelines that have relevance to the proposed activity;
- I will comply with the applicable legislation;
- I have not, 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



Signature of the Specialist

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF CANDICE LAMB

PERSONAL DETAILS

Position in Company	Junior Faunal Ecologist
Joined SAS Environmental Group of Companies	2024

MEMBERSHIP IN PROFESSIONAL SOCIETIES

A candidate member (Cand. Sci. Nat) of the South African Council for Natural Scientific Professions (SACNASP)

EDUCATION

Qualifications

MSc Zoology (University of Pretoria)	2022
BSc (Hons) Zoology (University of Pretoria)	2018
BSc Environmental Science (University of Pretoria)	2017

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, Limpopo, Northern Cape, KwaZulu-Natal, Eastern Cape, North West, Western Cape
Africa - Lesotho

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Avifaunal Assessments
- Faunal Assessments
- Desktop Studies, Mapping and Background Information Research

Freshwater Assessments

- Desktop Studies, Mapping and Background Information Research
- Desktop Freshwater Delineation
- Freshwater (wetland / riparian) Delineation and Assessment

GIS

- Mapping and GIS for various sectors and various disciplines (biodiversity, freshwater, aquatic, soil, and land capability).

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF CHARNE KOCK

PERSONAL DETAILS

Position in Company	Floral Ecologist
Joined SAS Environmental Group of Companies	2022

MEMBERSHIP IN PROFESSIONAL SOCIETIES

SANAP (South African National Antarctic Programme)
Golden Key Honorary Society
Member of the Botanical Society of South Africa (BotSoc)
Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 169998)
Member of the Land Rehabilitation Society of Southern Africa (LARSSA)
Member of the South African Association of Botanists (SAAB)

EDUCATION

Qualifications

MSc Plant Science (University of Pretoria)	2021
BSc (Hons) Plant Science (University of Pretoria)	2018
BSc Environmental Science (University of Pretoria)	2017

Short courses and Training

- Advanced Grass Identification Course (2019)
- CREW Tree Identification Course (2019)
- ISO 140001 Environmental Management Course (2020)
- Ecological Practices and Theory Short Course (2020)

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Limpopo, Mpumalanga, North West, Northern Cape, KwaZulu-Natal and Eastern Cape
Africa: Democratic Republic of the Congo (DRC)

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Terrestrial Ecological and Biodiversity Scoping Assessments
- Floral Assessments
- Floral walkdowns
- Alien and Invasive Plant Control Plan (AIPCP)
- Alien control monitoring
- Desktop Studies, Mapping and Background Information Research
- Plant permits

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF JANDRE POTGIETER

PERSONAL DETAILS

Position in Company	Faunal Ecologist
Joined SAS Environmental Group of Companies	2022

EDUCATION

Qualifications

PGCE Senior and intermediate phase (UNISA)	2021
BSc (Hons) Entomology (University of Pretoria)	2013
BSc Entomology (University of Pretoria)	2012

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 170165/24)

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Eastern Cape, Limpopo, Western Cape, Mpumalanga, Northern Cape, Free State, North West and KZN
Africa – Angola, Namibia, Malawi and Democratic Republic of the Congo (DRC)

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Faunal Assessments
- Faunal Species Rescue and Relocation Plans

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF JUSTIN SHAUN JACOBS

PERSONAL DETAILS

Position in Company	Junior Faunal Consultant
Joined SAS Environmental Group of Companies	2025

EDUCATION

Qualifications

BSc (Honours) Biological Sciences (University of Cape Town)	2019
BSc Zoology (University of Pretoria)	2017

AREAS OF WORK EXPERIENCE

South Africa – Free State, Gauteng, Mpumalanga, North West, Western Cape

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Desktop Studies and Background Information Research
- Faunal Assessments
- Avifaunal Assessments

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF DR SAMANTHA-LEIGH DANIELS

PERSONAL DETAILS

Position in Company	Senior Floral Ecologist
Joined SAS Environmental Group of Companies	2020

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP)
Member of the South African Association of Botanists (SAAB)
Member of the Botanical Society of South Africa (BotSoc)
Member of the Land Rehabilitation Society of Southern Africa (LARSSA)

EDUCATION

Qualifications

PhD (Plant Science) (University of Pretoria)	2023
MSc (Plant Science) (University of Pretoria)	2017
BSc (Hons) Zoology & Entomology (University of Pretoria)	2014
BSc Zoology & Entomology (University of Pretoria)	2013

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Free State, Northern Cape, Western Cape
Africa – Lesotho, Democratic Republic of Congo (DRC)

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

- Desktop Studies, Mapping and Background Information Research
- Terrestrial Ecological and Biodiversity Scoping Assessments
- Terrestrial Ecological and Biodiversity Screening Assessments
- Floral Assessments
- Alien and Invasive Plant Control Plans (AIPCPs)
- Terrestrial Monitoring
- Species Rescue and Relocation Plans
- Rehabilitation and Management Plans
- Strategic Net Positive Impact (NPI) Accounting

Offsets

- Biodiversity Offsets
- Wetland Offsets

Training

- Plant species identification
- Herbarium usage and protocols

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF STEPHEN VAN STADEN

PERSONAL DETAILS

Position in Company	Group CEO, Water Resource Discipline Lead, Managing Member, Ecologist, Aquatic Ecologist
Joined SAS Environmental Group of Companies	2003 (year of establishment)

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Registered Professional Scientist at South African Council for Natural Scientific Professions (SACNASP)
Accredited River Health Practitioner by the South African River Health Program (RHP)
Member of the South African Soil Surveyors Association (SASSO) Member of the Gauteng Wetland Forum
Member of the Gauteng Wetland Forum
Member of International Association of Impact Assessors (IAIA) South Africa;
Member of the Land Rehabilitation Society of South Africa (LaRSSA)

EDUCATION

Qualifications

MSc Environmental Management (University of Johannesburg)	2003
BSc (Hons) Zoology (Aquatic Ecology) (University of Johannesburg)	2001
BSc (Zoology, Geography and Environmental Management) (University of Johannesburg)	2000

Short Courses

Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017
Tools for Wetland Assessment (Rhodes University)	2017
Legal liability training course (Legricon Pty Ltd)	2018
Hazard identification and risk assessment training course (Legricon Pty Ltd)	2018
Wetland Management: Introduction and Delineation (WLID1502S) (University of the Free State)	2018
Hydropedology and Wetland Functioning (TerraSoil Science and Water Business Academy)	2018

AREAS OF WORK EXPERIENCE

South Africa – All Provinces
Southern Africa – Lesotho, Botswana, Mozambique, Zimbabwe Zambia
Eastern Africa – Tanzania Mauritius
West Africa – Ghana, Liberia, Angola, Guinea Bissau, Nigeria, Sierra Leona
Central Africa – Democratic Republic of the Congo

DEVELOPMENT SECTORS OF EXPERIENCE

1. Mining: Coal, chrome, Platinum Group Metals (PGMs), mineral sands, gold, phosphate, river sand, clay, fluorspar
2. Linear developments (energy transmission, telecommunication, pipelines, roads)
3. Minerals beneficiation
4. Renewable energy (Hydro, wind and solar)
5. Commercial development
6. Residential development
7. Agriculture
8. Industrial/chemical

KEY SPECIALIST DISCIPLINES

Legislative Requirements, Processes and Assessments

- Water Use Applications (Water Use Licence Applications / General Authorisations)
- Environmental and Water Use Audits
- Freshwater Resource Management and Monitoring as part of EMPR and WUL conditions

Freshwater Assessments

- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination

- Rehabilitation Assessment / Planning
- Maintenance and Management Plans
- Plant Species and Landscape Plans
- Freshwater Offset Plans
- Hydropedological Assessment
- Pit Closure Analysis

Aquatic Ecological Assessment and Water Quality Studies

- Habitat Assessment Indices (IHAS, HRC, IHIA & RHAM)
- Aquatic Macro-Invertebrates (SASS5 & MIRAI)
- Fish Assemblage Integrity Index (FRAI)
- Fish Health Assessments
- Riparian Vegetation Integrity (VEGRAI)
- Toxicological Analysis
- Water quality Monitoring
- Screening Test
- Riverine Rehabilitation Plans

Biodiversity Assessments

- Floral Assessments
- Biodiversity Actions Plan (BAP)
- Biodiversity Management Plan (BMP)
- Alien and Invasive Control Plan (AICP)
- Ecological Scan
- Terrestrial Monitoring
- Biodiversity Offset Plan

Soil and Land Capability Assessment

- Soil and Land Capability Assessment
- Hydropedological Assessment

Visual Impact Assessment

- Visual Baseline and Impact Assessments
- Visual Impact Peer Review Assessments