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DESKTOP LEVEL ECOLOGICAL INVESTIGATION AS PART OF THE ENVIRONMENTAL AUTHORISATION PROCESS FOR THE PROPOSED POWER STATION, POWERLINE AND GAS PIPELINE IN KOMATIPOORT, MPUMLANGA PROVINCE.

Prepared for

Nsovo Environmental Consulting

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EXECUTIVE SUMMARY

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the Environmental Impact and Authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

Based on the preliminary desktop assessment, the focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the focus area is located within an Ecological Support Area (ESA) local corridor, and a small portion of the power station and the majority of the proposed gas pipeline is located within an irreplaceable Critical Biodiversity Area (CBA). The remaining portions of the focus area is located within areas classified as either “heavily modified” or “other natural areas”.

During the desktop analysis, it was established that the southern and a portion in the north east of the focus area has a very high terrestrial sensitivity according to the National Web-based Environmental Screening Tool (2020). This is attributed to the CBA 1 and ESA within the focus area, as well as being a focus area for land-based protected areas expansion. The focus area is considered to have a medium sensitivity for plant species due to the potential presence of the sensitive species such as *Pavetta zeyheri subsp. microlancea*. For the Animal Species theme, the majority of the focus area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Sensitive species 2 and Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork). A field assessment will have to be undertaken to verify the current sensitivity of the habitat as well as the presence of the floral and faunal species within the focus area.

During the desktop analysis, several floral and faunal Species of Conservation Concern (SCC), were identified as having the potential to be observed within the focus area, according to the Plant of Southern Africa online database and the Mpumalanga State of Environment Report. As these species are provincially important, should they be present within the focus area, they will require rescuing and relocation to a similar habitat within the vicinity of the focus area before any construction activities commences. Thus, a field assessment would be required to establish whether suitable habitat exists to support these species within the focus area.

Following the desktop analysis of the biodiversity associated with the focus area, it is determined that a full biodiversity assessment will need to be undertaken to determine the sensitivity and the potential impacts to the focus area should the proposed development receive Environmental Authorisation.

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GLOSSARY OF TERMS

Most definitions are based on terms and concepts elaborated by Richardson *et al*. (2011), Hui and Richardson (2017) and Wilson *et al*. (2017), with consideration to their applicability in the South African context, especially South African legislation [notably the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), and the associated Alien and Invasive Species Regulations, 2014].

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.
Biome - as per 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 (as per the definition in NEMBA)	A geographic region which has in terms of section 40(1) been determined as a bioregion for the purposes of this Act;
CBA (Critical Biodiversity Area)	A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed vegetation and ridges.
Corridor	A dispersal route or a physical connection of suitable habitats linking previously unconnected regions.
Ecoregion	An ecoregion is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterise that region".
Endangered	Organisms in danger of extinction if causal factors continue to operate.
Endemic species	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.
ESA (Ecological Support Area)	An ESA provides connectivity and important ecological processes between CBAs and is therefore important in terms of habitat conservation.
Habitat (as per the definition in NEMBA)	A place where a species or ecological community naturally occurs.
IBA (Important Bird and Biodiversity Area)	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.
Indigenous vegetation (as per the definition in NEMA)	Vegetation occurring naturally within a defined area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Listed alien species	All alien species that are regulated in South Africa under the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004), Alien and Invasive Species Regulations, 2014.
Least Threatened	Least threatened ecosystems are still largely intact.
RDL (Red Data listed) species	According to the Red List of South African plants (http://redlist.sanbi.org/) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), critically endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.
SCC (Species of Conservation Concern)	The term SCC in the context of this report refers to all RDL (Red Data) and IUCN (International Union for the Conservation of Nature) listed threatened species as well as protected species of relevance to the project.

LIST OF ACRONYMS

AIP	Alien and Invasive Plant
BGIS	Biodiversity Geographic Information Systems
CARA	Conservation of Agricultural Resources Act, 1983 [Act No. 43 of 1983]
CBA	Critical Biodiversity Area
CR	Critically Endangered
DEFF	Department of Environment, Forestry and Fisheries
E-GIS	Environmental Geographical Information Systems
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programmes
EN	Endangered
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Areas
IBAs	Important Bird and Biodiversity Areas
IUCN	International Union for Conservation of Nature
LC	Least Concern
MTPA	Mpumalanga Tourism and Parks Agency
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act, 1998 [Act 107 of 1998]
NEMBA	National Environmental Management: Biodiversity Act, 2004 [Act 10 of 2004]
NPAES	National Protected Areas Expansion Strategy
PP	Poorly Protected
QDS	Quarter Degree Square
SACAD	South African Conservation Areas Database
SANBI	South African National Biodiversity Institute
SAPAD	South African Protected Areas Database
STS	Scientific Terrestrial Services
SWSAs	Strategic Water Source Areas
VU	Vulnerable
WP	Well Protected

1 INTRODUCTION

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the environmental assessment and authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

The focus area falls within the Nkomazi Local Municipality and is located directly south and east of the existing power station. The focus area is located south of the railway line within the town of Komatipoort and the proposed gas pipeline runs from the proposed power station to the N4 National Highway located south of the proposed power station (Figures 1 and 2). The focus area is situated approximately 3.6 km to the west of the Lebombo border post going into Mozambique. The immediate surroundings to the west comprises mainly agricultural lands with a watercourse traversing the focus area, urban development to the north and east and disturbed lowveld to the south.

This report, after consideration and description of the ecological integrity of the focus area, must guide the Environmental Assessment Practitioner (EAP) and relevant authorities, as to the viability and acceptability of the proposed development.

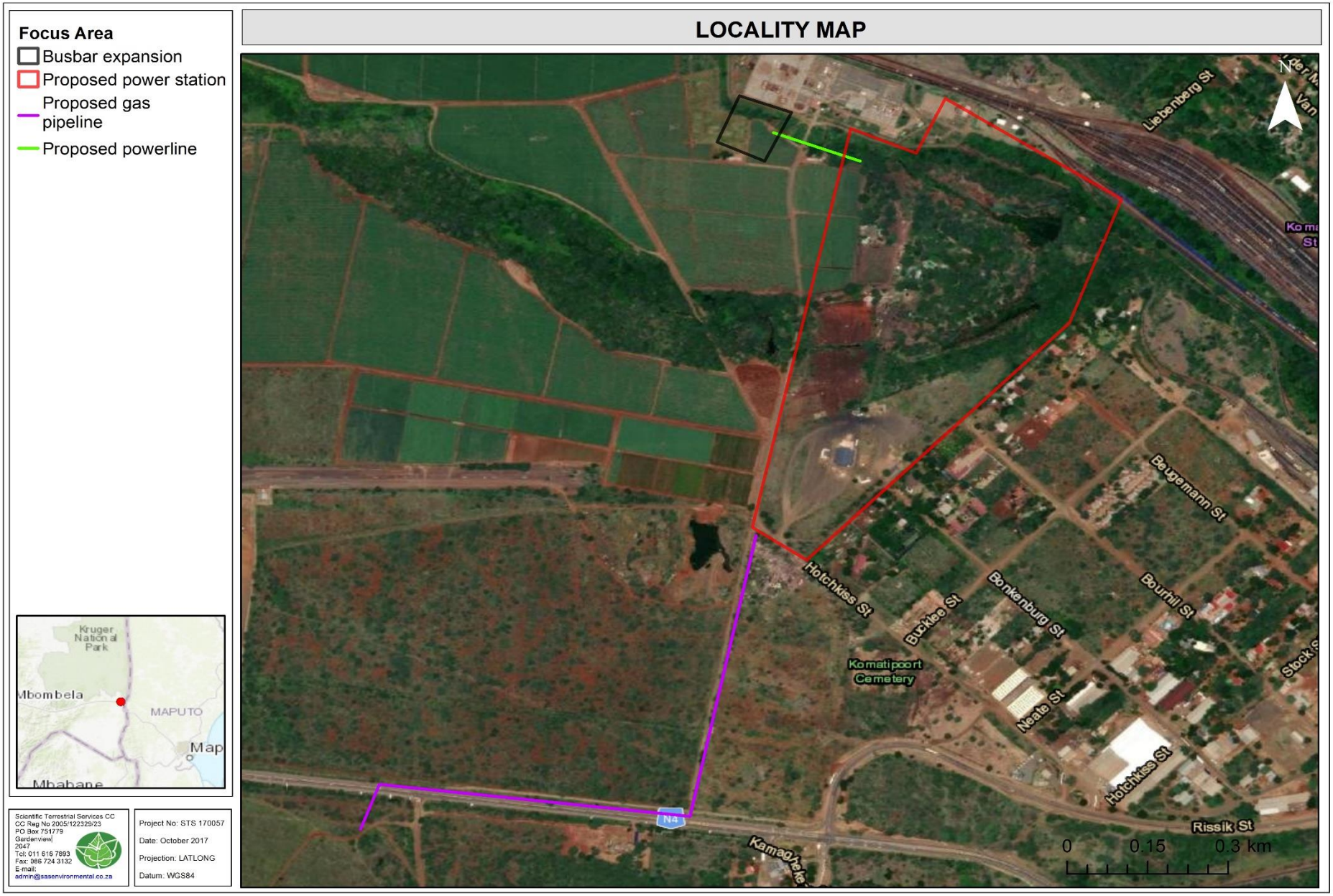

Figure 1: Digital satellite image depicting the focus area in relation to surrounding areas.

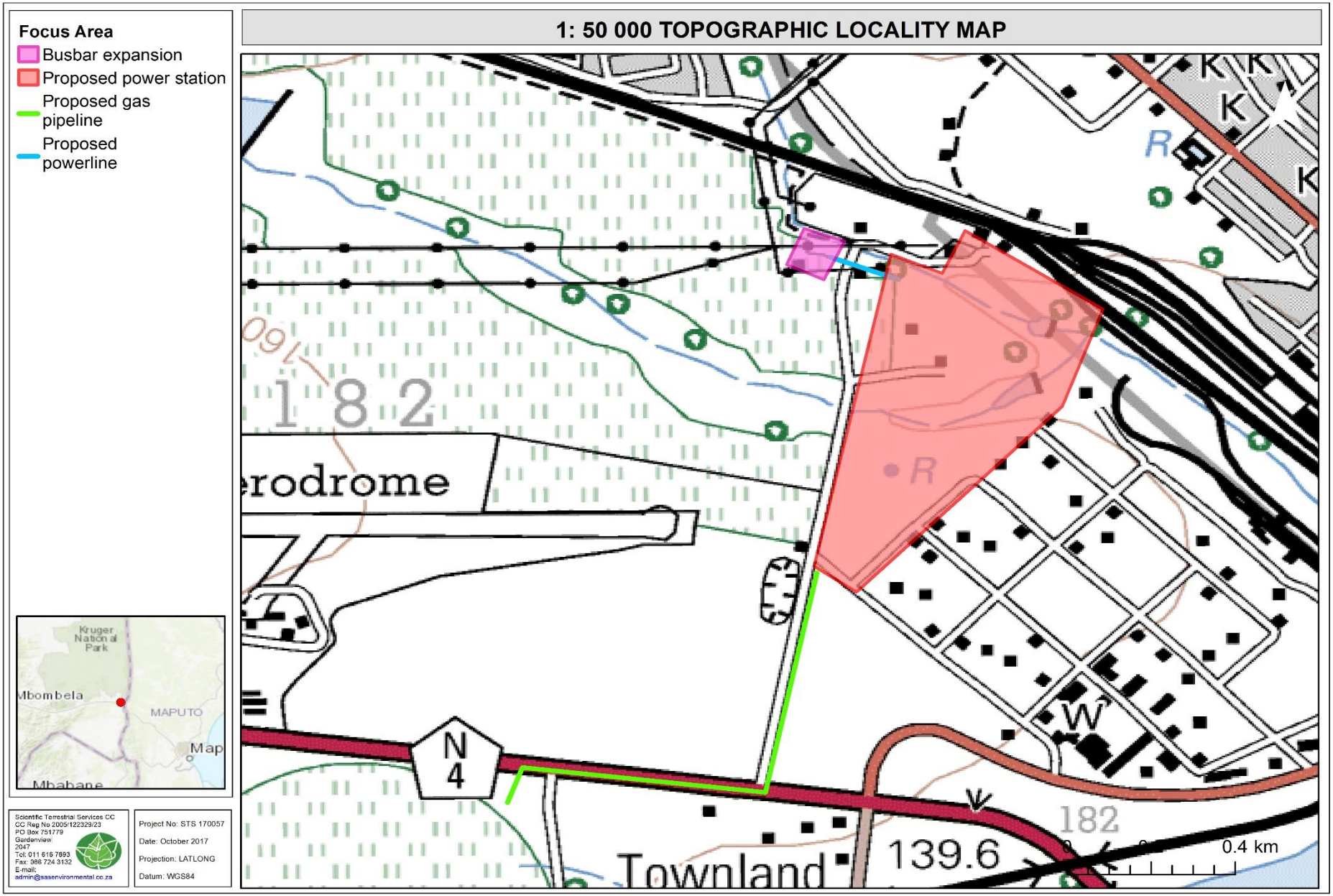

Figure 2: The focus area depicted on a 1:50 000 topographical map in relation to the surrounding area.

1.1 Scope of Work

Specific outcomes in terms of the report are as follows:

- Compile a desktop assessment with all relevant information as presented by South African National Biodiversity Institute's (SANBI) Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org) and the Department of Environment, Forestry and Fisheries (DEFF) 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 focus 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 (Appendix B of this report); and
- To provide the methodologies followed relating to the impact assessment and development of the mitigation measures (Appendix C) that was applied.

1.2 Assumptions and Limitations

The following assumptions and limitations are applicable to this report:

- The biodiversity desktop assessment is confined to the focus area and does not include detailed results of the adjacent properties, although the sensitivity of surrounding areas has been included on the relevant maps, based on the relevant national and provincial databases; 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 actual site characteristics within the focus area at the scale required to inform an environmental process. However, this information is useful as background information to the study and, based on the desktop results; sufficient decision making can take place with regards to the proposed development.

1.3 Legislative Requirements

The following legislative requirements were considered during the assessment:

- The Constitution of the Republic of South Africa, 1996[1];
- The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
- Government Notice R598 Alien and Invasive Species Regulations as published in the Government Gazette 37885 dated 1 September 2014 as it relates to the National Environmental Management Biodiversity Act, 1998 (Act No. 107 of 1998);
- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA);
- Government Gazette Notice 635 List of Protected Tree Species as published in the Government Gazette 42887 dated 6 December 2019 as it relates to the National Forest Act, 1998 (Act No. 84 of 1998); and
- The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA).

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

2 ASSESSMENT APPROACH

2.1 Literature and Database Review

A desktop study was compiled with all relevant information as presented by the relevant databases and SANBI's Biodiversity Geographic Information Systems (BGIS) website (http://bgis.sanbi.org). Relevant databases and documentation that were considered during the assessment of the focus area included [2]:

- The National Protected Areas Expansion Strategy (NPAES) focus areas for Protected Area Expansion, 2009 (Formally and Informally Protected Areas):
- The South African Conservation Areas Database, Quarter 4 (SACAD, 2019);
- The South African Protected Areas Database, Quarter 4 (SAPAD, 2019);
- Mpumalanga Biodiversity Sector Plan (MBSP, 2014);

[1] 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 not the acts amending it are allocated act numbers.

[2] Datasets obtained from:

- SANBI BGIS (2019). The South African National Biodiversity Institute - Biodiversity GIS (BGIS) [online]. URL: http://bgis.sanbi.org as retrieved in 2019; and
- Department of Environmental Affairs (DEA) Environmental Geographical Information Systems (E-GIS) website. URL: https://egis.environment.gov.za/

- Mucina and Rutherford, 2012 and 2018:
    - Biomes, Bioregions and Vegetation Type(s);
- The National Threatened Ecosystems (2011);
- The National Biodiversity Assessment (NBA, 2018);
- Important Bird and Biodiversity Areas (IBAs) (2015), in conjunction with the South African Bird Atlas Project (SABAP2); and
- The International Union for Conservation of Nature (IUCN).

2.2 Floral and faunal Species of Conservational Concern (SCC)

All relevant databases were utilised to record the floral and faunal SCC that are expected to occur within the focus area. Should the proponent require complete inventories of faunal and floral species that would occur within the focus area, a field assessment must take place.

3 RESULTS OF THE DESKTOP ANALYSIS

3.1 Conservation Characteristics of the Focus Area based on National and Provincial Datasets

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

Table 1: Summary of the biodiversity characteristics associated with the focus area [Quarter Degree Square (QDS) 2531BD].

<table>
<tr><th colspan="2">DETAILS OF THE FOCUS AREA IN TERMS OF MUCINA & RUTHERFORD (2018)</th><th colspan="7">DESCRIPTION OF THE TSHOKWANE-HLANE BASALT LOWVELD (SVI5) VEGETATION TYPE RELEVANT TO THE FOCUS AREA (MUCINA & RUTHERFORD 2006)</th></tr>
<tr><td>Biome</td><td>The focus area is situated within the Savanna Biome.</td><td>Distribution</td><td colspan="6">Mpumalanga Province and Swaziland</td></tr>
<tr><td>Bioregion</td><td>The focus area is located within the Lowveld Bioregion</td><td rowspan="3">Climate</td><td colspan="6">Summer rainfall with dry winters.</td></tr>
<tr><td>Vegetation Type</td><td>The focus area is situated within the Tshokwane-Hlane Basalt Lowveld vegetation type.</td><td>MAP (mm)</td><td>MAT (°C)</td><td>MFD (days)</td><td>MAPE (mm)</td><td>MASMS (%)</td></tr>
<tr><td colspan="2">CONSERVATION DETAILS PERTAINING TO THE FOCUS AREA (VARIOUS DATABASES)</td><td>572</td><td>21.7</td><td>0</td><td>1939</td><td>79</td></tr>
<tr><td rowspan="2">National Threatened Ecosystems [3] (2011)</td><td rowspan="2">The focus area is within an ecosystem of Least Concern. The sensitivity of the ecosystem associated with the focus area should be ground-truthed with a formal site visit.

The NEMBA provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), vulnerable (VU) or protected. The purpose of listing threatened ecosystems is primarily to reduce the rate of ecosystem and species extinction. This includes preventing further degradation and loss of structure, function, and composition of threatened ecosystems. The purpose of listing protected ecosystems is primarily to preserve witness sites of exceptionally high conservation value.</td><td>Altitude (m)</td><td colspan="6">180 – 400 m</td></tr>
<tr><td>Conservation</td><td colspan="6">Least threatened.
Target 19%. About 64% statutorily conserved</td></tr>
<tr><td rowspan="3">National Biodiversity Assessment (2018) (Figure 3)</td><td rowspan="3">The focus area falls within an least concerned vegetation type (Thsokwane-Hlane Basalt Lowveld) that is currently well protected (WP). The majority of focus area falls within the remaining extent of Tshokwane-Hlane Basalt Lowveld.

Ecosystem types are categorised as “not protected”, “poorly protected”, “moderately protected” and “well protected” based on the proportion of each ecosystem type that occurs within a protected area recognised in the Protected Areas Act, 2003 (Act No. 57 of 2003), and compared with the biodiversity target for that ecosystem type.</td><td>Geology & Soils</td><td colspan="6">The Letaba Formation basalts of the Karoo Supergroup in this area give rise to black, brown or red clayey soils, usually not more the 1 m deep. Vertisols, such as the Arcadia soil form, occur in low-lying areas and concave plains. Land types mainly Ea with some Dc.</td></tr>
<tr><td>Vegetation & landscape features (Dominant Floral Taxa in Appendix D)</td><td colspan="6">Usually fairly flat plains with open tree savanna, often dominated by tall Sclerocarya birrea and Acacia nigrescens with a moderately developed shrub layer and a dense herbaceous layer. On some sloping areas with shallower soils, trees are stunted (e.g. A. nigrescens).</td></tr>
<tr><td colspan="2">NATIONAL WEB BASED ENVIRONMENTAL SCREENING TOOL (2020)</td><td colspan="6">The Screening Tool is intended to allow for 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.</td></tr>
<tr><td colspan="2"></td><td>Terrestrial Sensitivity (Figure 5)</td><td colspan="6">The Terrestrial Sensitivity for the southern and north eastern portions of the focus area is considered to have a Very High Sensitivity. This is mainly attributed to the CBA1 and ESA associated with the focus area. Additionally, the focus area is within a focus area for land-based protected areas expansion. The remaining portion of the focus area is of low sensitivity.</td></tr>
<tr><td colspan="2"></td><td>Plant Species</td><td colspan="6">For the Plant Species theme, the focus area is considered to have a Medium Sensitivity due to the potential presence of the sensitive species such as Pavetta zeyheri subsp. microlancea</td></tr>
</table>

[3] For Environmental Impact Assessments (EIAs), the 2011 National list of Threatened Ecosystems remains the trigger for a Basic Assessment in terms of Listing Notice 3 of the EIA Regulations 2014, as amended published under the National Environmental Management Act, 1998 (Act No. 107 of 1998). However, the updated 2018 ecosystem threat status have also been considered in the assessment of impact significance in EIAs.

	The ecosystem protection level status is assigned using the following criteria: i. If an ecosystem type has more than 100% of its biodiversity target protected in a formal protected area either A or B, it is classified as Well Protected; ii. When less than 100% of the biodiversity target is met in formal A or B protected areas it is classified it as Moderately Protected; iii. If less than 50% of the biodiversity target is met, it is classified it as Poorly Protected; and If less than 5% it is Hardly Protected.
SAPAD (2019, Q4); SACAD (2019, Q4); NPAES (2009) **(Figure 4)**	The SAPAD[4] (2019, Q4) and NPAES (2009) database indicate that the **Kruger National Park** is situated ± 2 km north of the focus area. No other protected areas are located within 10 km of the focus area.
IBA (2015)	The **Kruger National Park** is identified as an IBA as well. **IBA trigger species** **Globally threatened** species are Cape Vulture (*Gyps coprotheres*), Hooded Vulture (*Necrosyrtes monachus*), White-backed Vulture (*Gyps africanus*), Lappet-faced Vulture (*Torgos tracheliotos*), Southern Ground-Hornbill (*Bucorvus leadbeateri*), White-headed Vulture (*Trigonoceps occipitalis*), Kori Bustard (*Ardeotis kori*), Crowned Eagle *(Stephanoaetus coronatus)*, Bateleur (*Terathopius ecaudatus*), Secretarybird (*Sagittarius serpentarius)* and Martial Eagle (*Polemaetus bellicosus*). **Regionally threatened** species are White-backed Night Heron (*Gorsachius leuconotus*), Saddlebilled Stork (*Ephippiorhynchus senegalensis*), Tawny Eagle (*Aquila rapax*), African Finfoot (*Podica senegalensis*), African Grass Owl (*Tyto capensis*), Pel's Fishing Owl (*Scotopelia peli*), Black Stork (*Ciconia nigra)*, Marabou Stork (*Leptoptilos crumenifer*), African Pygmy Goose (*Nettapus auratus)*,

Animal Species (Figure 6)	For the Animal Species theme, the majority of the focus area is considered to have a **medium sensitivity** due to the potential presence of sensitive species such as Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of **high sensitivity** due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork).
STRATEGIC WATER SOURCE AREAS FOR SURFACE WATER (2017)	
Surface water Strategic Water Source Areas (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 focus area is not located within 10 km of a SWSA.
MPUMALANGA BIODIVERSITY SECTOR PLAN (MBSP, 2014) (FIGURE 7)	
Ecological Support Area: Local Corridor	The north eastern portion of the focus area is located within an ESA: Local corridor. These are finer-scale alternative pathways that build resilience into the corridor network by ensuring connectivity between climate change focal areas, reducing reliance on single landscape-scale corridors.
Critical Biodiversity Area: Irreplaceable	A small portion of the proposed power station and the majority of the proposed gas pipeline is located within an area classified as a CBA Irreplaceable area. This category includes: (1) Areas required to meet targets and with irreplaceability values of more than 80%; (2) Critical linkages or pinch-points in the landscape that must remain natural; (3) Critically Endangered Ecosystems.
Heavily Modified	The remaining portions of the focus area are classified as areas that are "Heavily Modified". These are areas currently modified to such an extent that any valuable biodiversity and ecological functions have been lost.

[4] **SAPAD (2019):** 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).

	Bat Hawk (*Macheiramphus alcinus*), Lanner Falcon (*Falco biarmicus*), Greater Painted-snipe (*Rostratula benghalensis*), Half-collared Kingfisher (*Alcedo semitorquata*) and Lemon-breasted Canary (*Serinus citrinipectus*). **Restricted-range and biome-restricted species** include Arnot's Chat (*Pentholaea arnotti*) (restricted to the north of the park) and the uncommon Stierling's Wren-Warbler (*Calamonastes stierlingi*), Gorgeous Bush-Shrike (*Telophorus quadricolor*), Meves's Starling (*Lamprotornis mevesii*) and Lemon-breasted Canary (*Serinus citrinipectus*). Burchell's Starling (*L. australis*) and White-throated Robin-Chat (*Cossypha humeralis*) are fairly common, while Kurrichane Thrush (*Turdus libonyanus*), White-bellied Sunbird (*Cinnyris talatala*) and Brown-headed Parrot (*Poicephalus cryptoxanthus*) are common.	**Other Natural Areas (ONAs)**	The remaining portions of the focus area are classified as "Other Natural Areas". These areas have not been identified as priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

ESA = Ecological Support Area; NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; SACAD = South African Conservation Areas Database; ONA = Other Natural Area; NPAES = National Protected Areas Expansion Strategy; IBA = Important Bird Area; 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); PA = Protected Area.

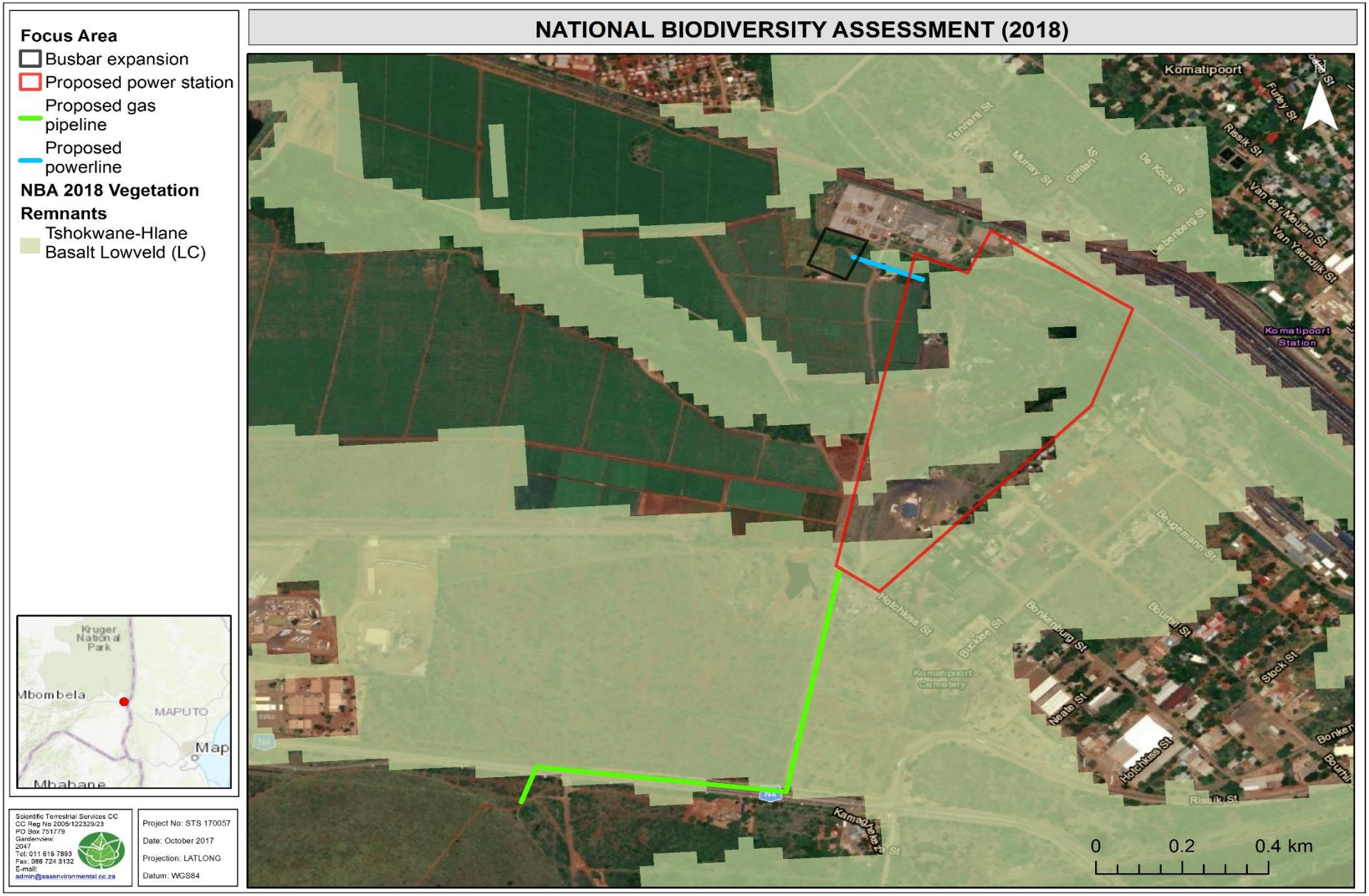

Figure 3: The remaining extent of the least concerned and well protected Tshokwane-Hlane Basalt Lowveld, according to the National Biodiversity Assessment (NBA, 2018).

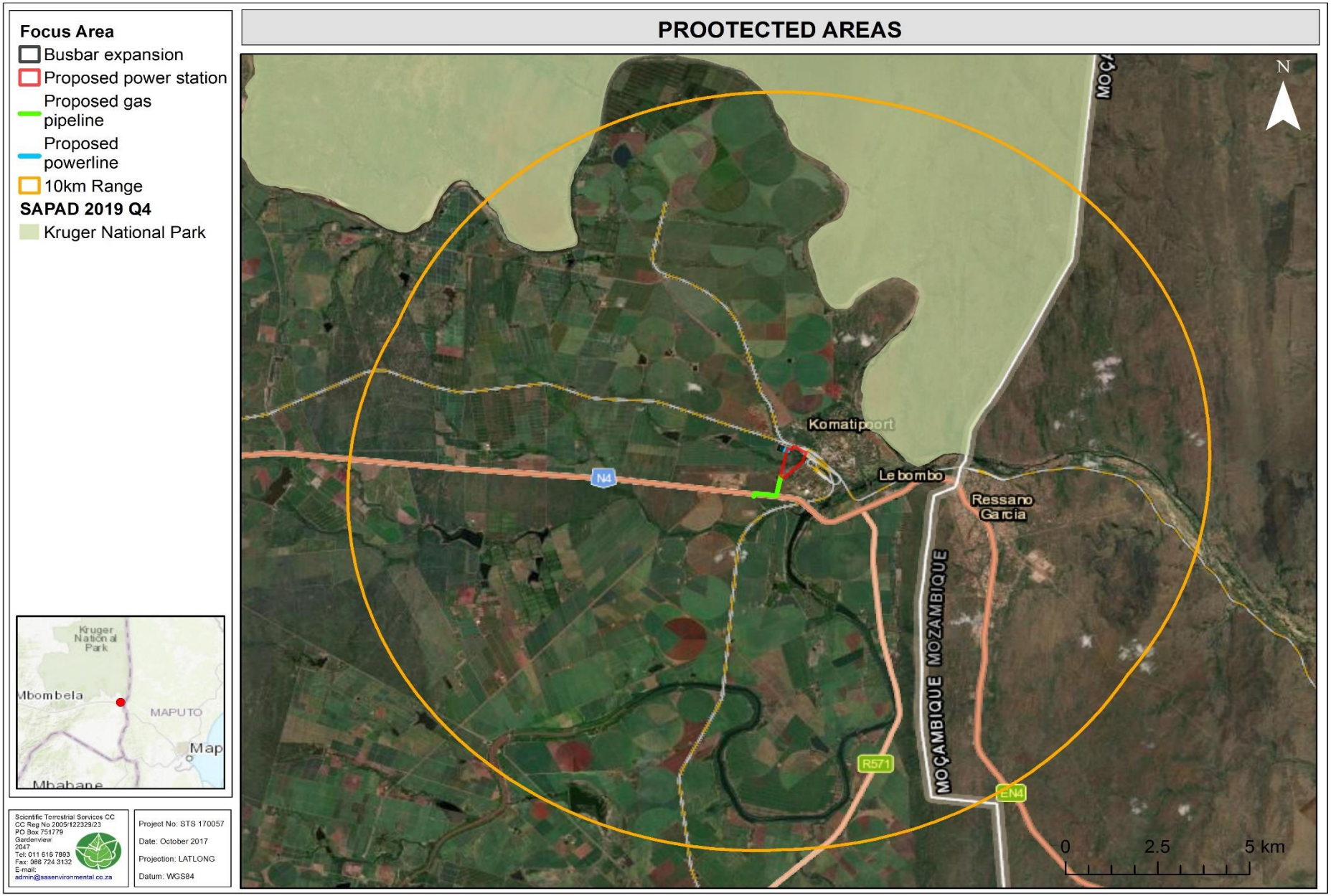

Figure 4: Nationally protected area associated with the focus area (various databases).

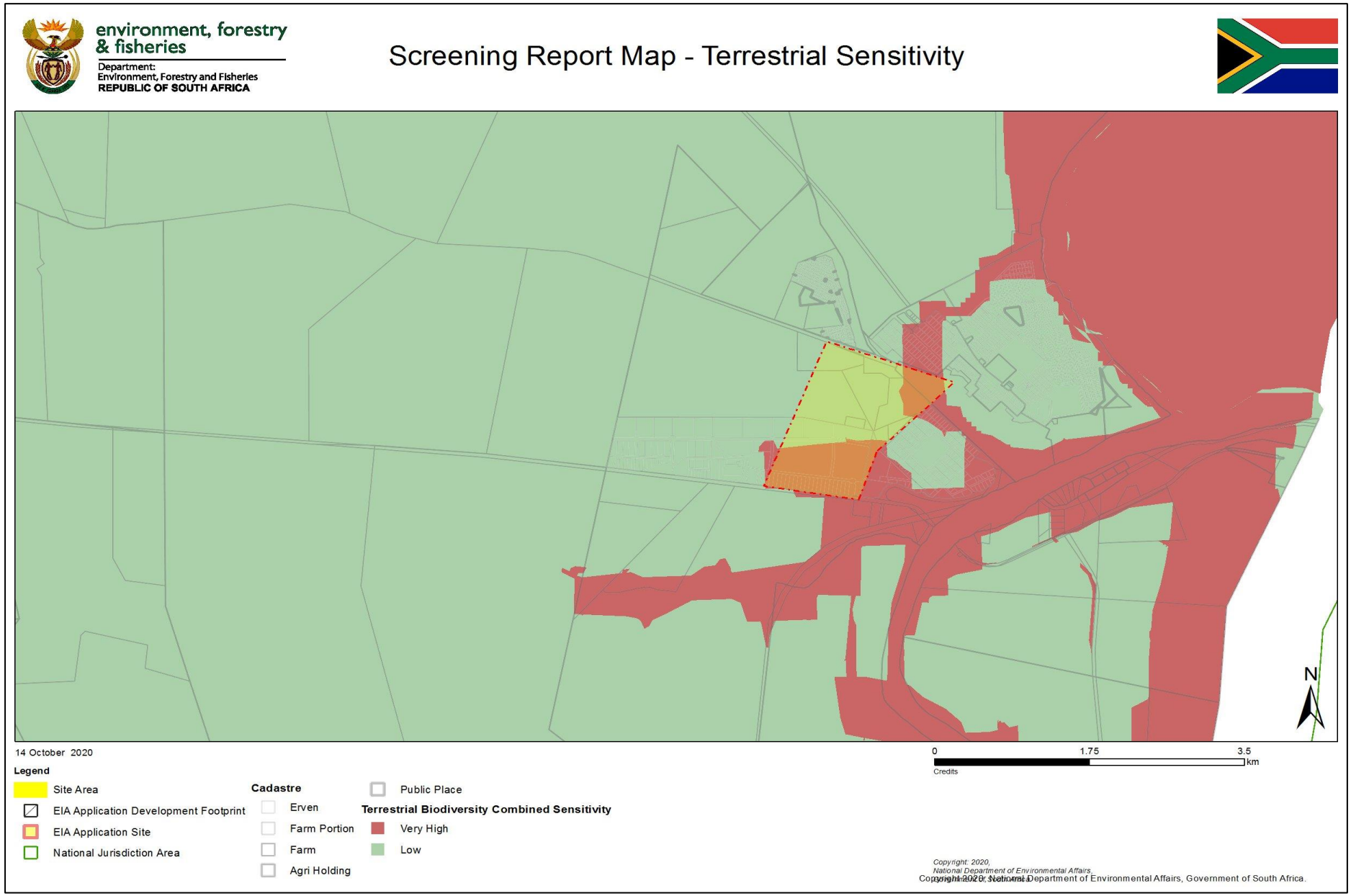

Figure 5: Terrestrial sensitivity map of the focus area as obtained from the National Web Based Environmental Screening Tool (2020).

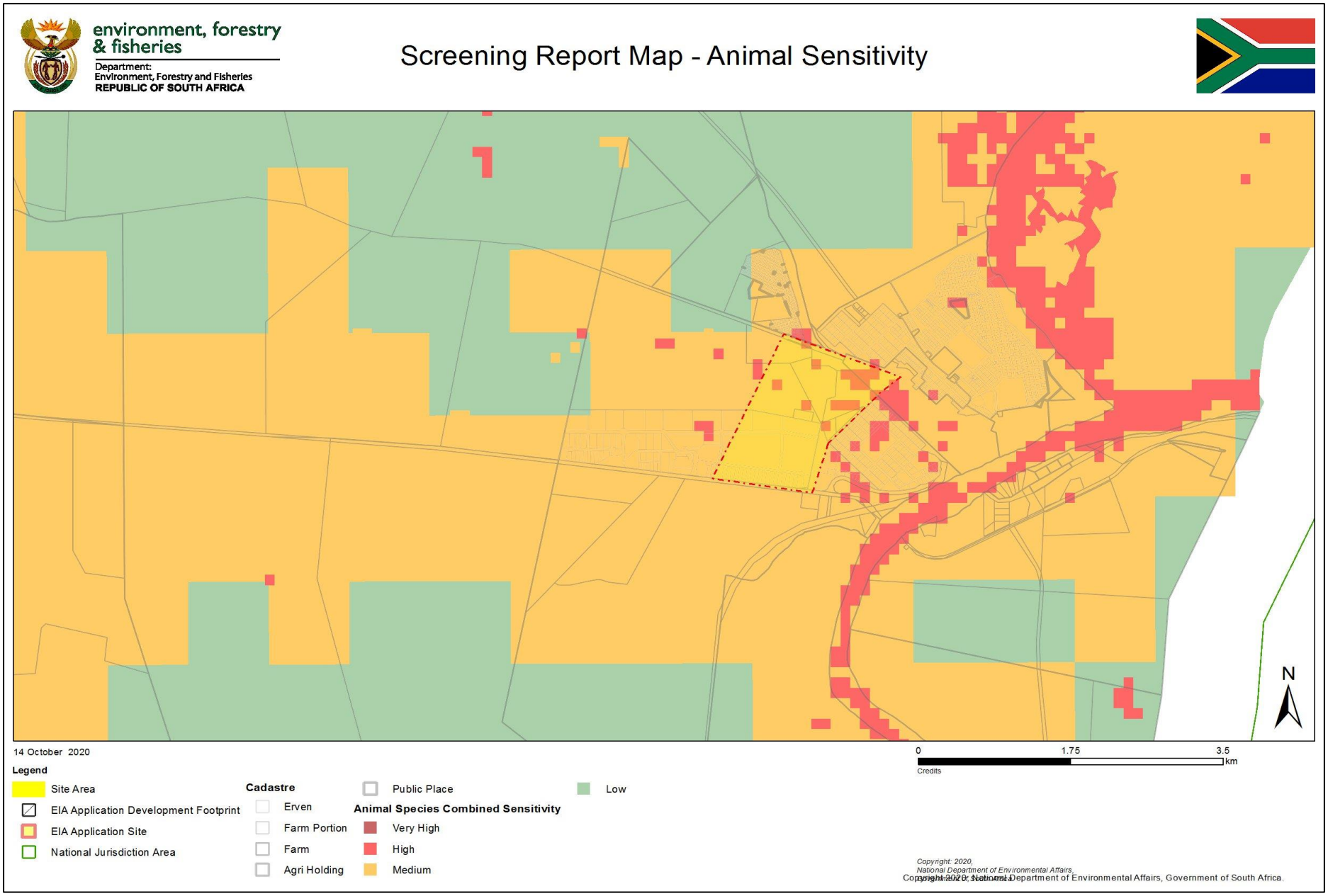

Figure 6: Animal Species sensitivity map for the focus area as obtained from the National Web Based Environmental Screening Tool (2020).

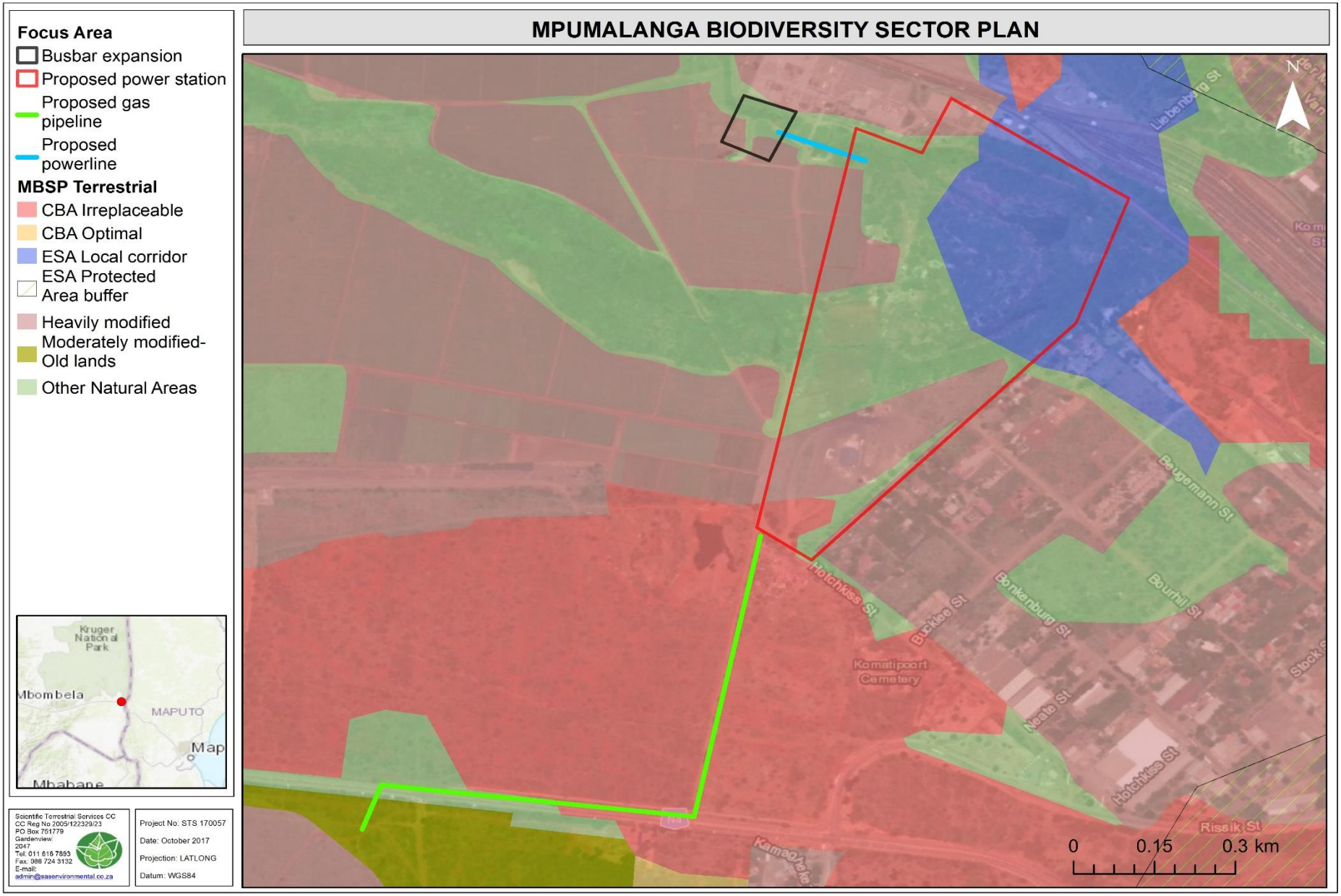

Figure 7: Critical Biodiversity Area (CBA) and Ecological Support Areas (ESA) relating to the focus area, according to MBSP (2014).

3.2 Floral and faunal Species of Conservation Concern (SCC)

3.2.1 Floral SCC

Threatened/protected species are species that are facing a high risk of extinction. Any species classified in the IUCN categories Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) is a threatened species. Furthermore, SCC are species that have a high conservation importance in terms of preserving South Africa's high floristic diversity and include not only threatened species, but also those classified in the categories Extinct in the Wild (EW), Regionally Extinct (RE), Near Threatened (NT), Critically Rare, Rare and Declining. A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA). A record of floral SCC and their habitat requirements was acquired from these primary sources:

- Southern African plant names and floristic details from SANBI, i.e. the new Plant of Southern Africa online database (POSA) (http://posa.sanbi.org/);
  - This website provides access to South African plant names (taxa), specimens (herbarium sheets) and observations of plants made in the field (botanical records). Data is obtained from the Botanical Database of Southern Africa (BODATSA), which contains records from the National Herbarium in Pretoria (PRE), the Compton Herbarium in Cape Town (NBG & SAM) and the KwaZulu-Natal Herbarium in Durban (NH).
  - Information on habitat requirements etc. is obtained from the SANBI Red List of South African Plants website (http://redlist.sanbi.org/).
  - Typically, data is extracted for the Quarter Degree Square (QDS) in which the focus area is situated but where it is deemed appropriate, a larger area can be included.
- NEMBA TOPS (2015) listed for Mpumalanga Province.
- The list of Schedule 11 Protected Plants [Section 69 (1)(a)] and Schedule 12 Specially Protected Plants [Section 69 (1)(b)] under the Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998).
- Data obtained from the Mpumalanga Tourism and Parks Agency for the Komatipoort region.
- A List of Protected Tree Species under Section 12 of the National Forest Act, 1998 (Act No. 84 of 1998).

South Africa uses the internationally endorsed IUCN Red List Categories and Criteria in the Red List of South African plants. This scientific system is designed to measure species' risk

of extinction. The purpose of this system is to highlight those species that are most urgently in need of conservation action. Due to its strong focus on determining risk of extinction, the IUCN system does not highlight species that are at low risk of extinction but may nonetheless be of high conservation importance. Because the Red List of South African plants is used widely in South African conservation practices such as systematic conservation planning or protected area expansion, we use an amended system of categories designed to highlight those species that are at low risk of extinction but of conservation concern.

Definitions of the national Red List categories

Categories marked with **N** are non-IUCN, national Red List categories for species not in danger of extinction but considered of conservation concern. The IUCN equivalent of these categories is Least Concern (LC).

- **Extinct (EX)** A species is Extinct when there is no reasonable doubt that the last individual has died. Species should be classified as Extinct only once exhaustive surveys throughout the species' known range have failed to record an individual.
- **Extinct in the Wild (EW)** A species is Extinct in the Wild when it is known to survive only in cultivation or as a naturalized population (or populations) well outside the past range.
- **Regionally Extinct (RE)** A species is Regionally Extinct when it is extinct within the region assessed (in this case South Africa), but wild populations can still be found in areas outside the region.
- **Critically Endangered, Possibly Extinct (CR PE)** Possibly Extinct is a special tag associated with the category Critically Endangered, indicating species that are highly likely to be extinct, but the exhaustive surveys required for classifying the species as Extinct has not yet been completed. A small chance remains that such species may still be rediscovered.
- **Critically Endangered (CR)** A species is Critically Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Critically Endangered, indicating that the species is facing an extremely high risk of extinction.
- **Endangered (EN)** A species is Endangered when the best available evidence indicates that it meets at least one of the five IUCN criteria for Endangered, indicating that the species is facing a very high risk of extinction.
- **Vulnerable (VU)** A species is Vulnerable when the best available evidence indicates that it meets at least one of the five IUCN criteria for Vulnerable, indicating that the species is facing a high risk of extinction.
- **Near Threatened (NT)** A species is Near Threatened when available evidence indicates that it nearly meets any of the IUCN criteria for Vulnerable and is therefore likely to become at risk of extinction in the near future.
- [N]**Critically Rare** A species is Critically Rare when it is known to occur at a single site but is not exposed to any direct or plausible potential threat and does not otherwise qualify for a category of threat according to one of the five IUCN criteria.
- [N]**Rare** A species is Rare when it meets at least one of four South African criteria for rarity but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria. The four criteria are as follows:
    - Restricted range: Extent of Occurrence (EOO) <500 km2, OR
    - Habitat specialist: Species is restricted to a specialized microhabitat so that it has a very small Area of Occupancy (AOO), typically smaller than 20 km2, OR
    - Low densities of individuals: Species always occurs as single individuals or very small subpopulations (typically fewer than 50 mature individuals) scattered over a wide area, OR
    - Small global population: Less than 10 000 mature individuals.
- **Least Concern** A species is Least Concern when it has been evaluated against the IUCN criteria and does not qualify for any of the above categories. Species classified as Least Concern are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.
- **Data Deficient - Insufficient Information (DDD)** A species is DDD when there is inadequate information to make an assessment of its risk of extinction, but the species is well defined. Listing of species in this category indicates that more information is required, and that future research could show that a threatened classification is appropriate.
- **Data Deficient - Taxonomically Problematic (DDT)** A species is DDT when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible.
- **Not Evaluated (NE)** A species is Not Evaluated when it has not been evaluated against the criteria. The national Red List of South African plants is a comprehensive assessment of all South African indigenous plants, and therefore all species are assessed and given a national Red List status. However, some species

included in Plants of southern Africa: an online checklist are species that do not qualify for national listing because they are naturalized exotics, hybrids (natural or cultivated), or synonyms. These species are given the status Not Evaluated and the reasons why they have not been assessed are included in the assessment justification.

According to the MTPA and POSA numerous floral SCC are expected to occur within the QDS (2531BD) (Table 3).

Table 2: POSA plant list for the QDS (2531BD) (SANBI, http://posa.sanbi.org/sanbi/Explore).

Family	Species	IUCN	Growth Form
Asphodelaceae	*Aloe komatiensis*	EN	Succulent, herb
Rubiaceae	*Pavetta zeyheri*	EN	Dwarf shrub

EN = Endangered

Table 3: MTPA plant list for the Komatipport area.

Family	Scientific Name	Conservation RSA	MTPA	Endemic
Apocynaceae	*Adenium swazicum*	CR	CR	FSA
Rubiaceae	*Pavetta zeyheri subsp. microlancea*	Rare	Rare	
Acanthaceae	*Barleria oxyphylla*	Rare	Rare	FSA
Brassicaceae	*Cleome schlechteri*	DDD	DDD	SA
Apocynaceae	*Orbea paradoxa*	LC	VU	Not
Orchidaceae	*Ansellia africana*	Declining	Declining	Not
Hyacinthaceae	*Drimia intricata*	LC	Muthi	Not
Amaryllidaceae	*Crinum stuhlmannii*	Declining	Declining	Not

CR = Critically Endangered; FSA = LC = Least Concern; SA = South Africa

Table 4: Schedule 11 - PROTECTED PLANTS (SECTION 69 (1) (a))

Common Name	Scientific Name
all species of trees ferns, excluding the bracken fern	All species of the Genus: *Cyathea capensis and Cyathea dregei*
all species of cycards in Republic of South Africa and the seedling of the species of cycards referred to in schedule 12	All species of the family Zamiaceae occurring in the Republic of South Africa and the seedlings of the species of Encephalartos referred to in Schedule 12
all species of yellow wood	*Podocarpus spp.*
all species of arum lilies	*Zantedeschia spp.*
"volstruiskom"	*Schizobasis intricate*
"knolklimop"	*Bowiea volubilis*
All species of red-hot pokers	*Kniphofia spp.*
All species of aloes, excluding: (a) All species not occurring in Mpumalanga and (b) The following species: all species of haworthias all species of agapanthus all species of squill	Aloe spp., excluding: (a) All species not occurring in Mpumalanga (b) The following species: *Haworthia spp.* *Agapanthus spp.* *Scilla spp.*
all species of pineapple flower	*Eucomis spp.*
all species of dracaena	*Dracaena spp.*
all species of paint brush	*Haemanthus spp. and Scadoxis spp.*
Cape poison bulb	*Boophane disticha*
all species of clivia	*Clivia spp.*
all species of brunsvigia	*Brunsvigia spp.*
all species of crinum	*Crinum spp.*
ground lily	*Ammocharis coranica*
all species of fire lily	*Cyrtanthus spp.*
river lily	*Hesperantha coccinea*
all species of watsonia	*Watsonia spp.*

all species of gladioli	*Gladiolus spp.*
wild ginger	*Siphonochilus aethiopicus*
all species of orchids	All species of the family Orchidacaea
all species of the family proteaceae	All species of the family Proteacea
all species of black stinkwood	*Ocotea spp.*
kiaat	*Pterocarpus angolensis*
tamboti	*Spirostachys africana*
the following species of euphorbias: Euphorbia bernardii and Euphorbia grandialata	The following species of euphorbias: *Euphorbia bernardii and Euphorbia grandialata*
common bersama	*Bersama tysoniana*
red ivory	*Berchemia zeyheri*
Pepperbark tree	*Warburgia salutaris*
all species of adenia	*Adenia spp.*
bastard onion wood	*Cassipourea gerrrdii*
assegai tree	*Curtisia dentata*
all species of olive trees	all species of the Genus Olea
all species of impala lilies	all species of the Genus Adenium
kudu lily	*Pachypodium saundersii*
all species of brachystelma	*Brachystelma spp.*
all species of ceropegia	*Ceropegia spp.*
all species of huerniopsis and huernia	*Huernipsis and Huernia spp.*
all species of duvalia	*Duvalia spp.*
all species of stapeliads	*Stapelia spp.*
all species of orbeanthus	*Orbeanthus spp.*
all species of orbeas	*Orbea spp.*
all species of orbeopsis	*Orbeopsis soo.*

Table 5: Schedule 12 - SPECIALLY PROTECTED PLANTS (SECTION 69 (1) (b))

Common Name	Scientific Name
(a) all plants, excluding seedlings, of the following species of cycads: *dolomiticus, dyer, middleburg, eugene marais, heenan, inopinus, laevifolius, lanatus, lebombo, ngoyanus, paucidentatus, modjadje and villosus*	(a) all plants, excluding seedlings, of the following species of the Genus *Encephalartos: E. dolomiticus, E. dyerianus, E. middleburgensis, E. eugene maraissii, E. heenanii, E. inopinus, E. laevifolius, E. lanatus, E. transvenosus and E. villosus and* many species derived from the above species
(b) all plants of the following. species of *cycards: cupidus and humilus*	*(b)* all plants of the following species of the Genus *Encephalartos: E. cupids and E. humilus*
(c) all species of cycadsin their natural habitat	(c) all plants of the Genus *Encephalartos* in their natural habitat

Table 6: List of protected tree species under the National Forest Act (NFA, 2019).

Scientific Name	Common Name
Vachellia erioloba	Camel thorn
Vachellia haematoxylon	Grey Camel Thorn
Adansonia digitata	Baobab
Afzelia quanzensis	Pod mahogany
Balanites subsp. maughamii	Torchwood
Barringtonia racemosa	Powder-puff tree
Boscia albitrunca	Shepherd's tree
Brachystegia spiciformis	Msasa
Breonadia salicina	Matumi
Bruguiera gymnorrhiza	Black mangrove
Cassipourea swaziensis	Swazi onionwood
Catha edulis	Bushman's tea

Scientific Name	Common Name
Ceriops tagal	Indian mangrove
Cleistanthus schlechteri var. schlechteri	False tamboti
Colubrina nicholsonii	Pondo weeping thorn
Combretum imberbe	Leadwood
Curtisia dentata	Assegai
Elaeodendron transvaalensis	Bushveld saffron
Erythrophysa transvaalensis	Bushveld red balloon
Euclea pseudebenus	Ebony guarri
Ficus trichopoda	Swamp fig
Leucadendron argenteum	Silver tree
Lumnitzera racemose var. racemosa	Tonga mangrove
Lydenburgia abbottii	Pondo bushman's tea
Lydenburgia cassinoides	Sekhukhuni bushman's tea
Mimusops caffra	Coastal red milkwood
Newtonia hildebrandtii var. hildebrandtii	Lebombo wattle
Ocotea bullata	Stinkwood
Ozoroa namaquensis	Gariep resin tree
Philenoptera violacea	Apple-leaf
Pittosporum viridiflorum	Cheesewood
Podocarpus elongatus	Breede River yellowwood
Podocarpus falcatus (Afrocarpus falcatus)	Outeniqua yellowwood
Podocarpus henkelii	Henkel's yellowwood
Podocarpus latifolius	Real yellowwood
Protea comptonii	Saddleback sugarbush
Protea curvata	Serpentine sugarbush
Prunus africana	Red stinkwood
Pterocarpus angolensis	Wild teak
Rhizophora mucronata	Red mangrove
Sclerocarya birrea subsp. caffra	Marula
Securidaca longepedunculata	Violet tree
Sideroxylon inerme subsp. inerme	White milkwood
Tephrosia pondoensis	Pondo poison pea
Warburgia salutaris	Pepper-bark tree
Widdringtonia cedarbergensis	Clanwilliam cedar
Widdringtonia schwarzii	Willowmore cedar

Should any floral SCC be encountered within the focus area during any development activities, these species should be marked and avoided. A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 7 of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA). If it is not possible to avoid all individual species, a permit application to remove or relocate the protected species must be submitted and approval should be granted prior to any activities taking place. Rescue and relocation of tall trees is not considered feasible, and it is therefore recommended that the proposed layout be designed in such a way to avoid all tall protected tree species (>3 m).

3.2.2 Faunal SCC

The tables below indicate the faunal SCC that are expected to occur within the focus area, obtained from the MTPA, the Mpumalanga State of the Environment Report (2003) and

Species listed as protected under the Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998):

Table 7: List of bird species likely to be observed within the Komatipoort region (MTPA).

Common Name	Scientific Name	Conservation RSA	MTPA	Endemic
African Finfoot	*Podica senegalensis*	VU	VU	
Bateleur	*Terathopius ecaudatus*	EN	EN	-
White-backed Vulture	*Gyps africanus*	CR	CR	-

CR = Critically Endangered; EN = Endangered

Table 8: List of mammal species and IUCN Red List Category (Cohen & Camacho, 2002a) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	MP 2003 Status
Cape mole rat	*Georychus capensis*	EN
Sclater's golden mole	*Chlorotalpa sclateri montana*	CR
Highveld golden mole	*Amblysomus septentrionalis*	VU
Rough-haired golden mole	*Chrysospalax villosus rufopallidus*	CR
Juliana's golden mole	*Neamblysomus julianae*	EN
Robust golden mole	*Amblysomus robustus*	VU
Meester's golden mole	*Amblysomus hottentotus meesteri*	VU
Laminate vlei rat	*Otomys laminatus*	VU
Peak-saddle horseshoe bat	*Rhinolophus blasii empusa*	EN
Lesser long-fingered bat	*Miniopterus fraterculus*	VU
Welwitsch's hairy bat	*Myotis welwitschii*	EN
Short-eared trident bat	*Cloeotis percivali australis*	EN
Aardvark	*Orycteropus afer*	NE
Oribi	*Ourebia ourebi*	VU
African striped weasel	*Poecilogale albinucha*	LC
Wild dog	*Lycaon pictus*	EN
Pangolin	*Manis temminckii*	VU
Aardwolf	*Proteles cristatus*	NE
African Leopard	Panthera pardus	NE
Natal red rock rabbit	Pronolagus crassicaudatus ruddi	NE

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; NE=Not Evaluated

Table 9: List of bird species and IUCN Red List Category (Cohen & Camacho, 2002b) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
White winged Flufftail	*Sarothrura ayresi*	CR
Rudd's Lark	*Heteromirafra ruddi*	CR
Yellow breasted Pipit	*Hemimacronyx chloris*	VU
Bald Ibis	*Geronticus calvus*	VU
Botha's Lark	*Spizocorys fringillaris*	EN
Wattled Crane	*Bugeranus carunculatus*	CR
Blue Crane	*Anthropoides paradiseus*	VU
Grey Crowned Crane	*Balearica reguloru,*	VU
Blue Swallow	*Hirundo atrocaerulea*	CR
Pink throated Twinspot	*Hypargos margaritatus*	NT
Chestnut banded Plover	*Charadrius pallidus*	NT
Striped Flufftail	*Sarothrura affinis*	VU
Southern Ground Hornbill	*Bucorvus leadbeateri*	VU
Black-rumped Buttonquail	*Turnix hottentotta nana*	EN
Blue Korhaan	*Eupodotis caerulescens*	VU
Stanley's Bustard	*Neotis denhami*	VU
African Marsh Harrier	*Circus ranivorus*	VU
Grass Owl	*Tyto capensis*	VU
Lesser Flamingo	*Phoeniconaias minor*	NT

Greater Flamingo	*Phoeniconaias roseus*	NT
White bellied Korhaan	*Eupodotis senegalensis*	VU
Saddle billed Stork	*Ephippiorhynchus senegalensis*	CR
Lappet faced Vulture	*Torgos tracheliotos*	EN
White headed Vulture	*Trigonoceps occipitalis*	EN
Bateleur	*Terathopius ecaudatus*	VU
Cape Vulture	*Gyps coprotheres*	VU
Martial Eagle	*Polemaetus bellicosus*	VU
Peregrine Falcon	*Falco peregrinus minor*	VU
Taita Falcon	*Falco fasciinucha*	NT

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; NT= Near Threatened

Table 10: List of reptile species and their IUCN Red List Category (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Haacke's flat gecko	*Afroedura haackei*	EN
Abel Erasmus Pass flat gecko	*Afroedura sp.*	EN
Mariepskop flat gecko	*Afroedura sp.*	EN
Rondavels flat gecko	*Afroedura sp.*	EN
Forest/Natal purple-glossed snake	*Amblyodipsas concolor*	VU
Lowveld shieldnosed snake	*Aspidelaps scutatus intermedius*	VU
Dwarf chameleon	*Bradypodion transvaalense*	VU
Sungazer/ Giant girdled lizard	*Cordylus giganteus*	VU
Barberton girdled lizard	*Cordylus warreni barbertonensis*	VU
Lebombo girdled lizard	*Cordylus warreni*	VU
Swazi rock snake	*Lamprophis swazicus*	VU
Transvaal flat lizard	*Platysaurus orientalis*	NT
Wilhelm's flat lizard	*Platysaurus wilhelmi*	VU
Montane burrowing skink	*Scelotes mirus*	LC
Breyer's longtailed seps	*Tetradactylus breyeri*	VU
Copper Grass Lizard	*Chamaesaura aenea*	NT

EN= Endangered; VU= Vulnerable; NT= Near Threatened; LC= Least Concern

Table 11: List of amphibian species and their IUCN Red List Category (Williamson & Theron, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Karoo Toad	*Bufo gariepensis nubicolus*	VU
Natal Ghost Frog	*Heleophryne natalensis*	VU
Spotted Shovel-Nosed Frog	*Hemisus guttatus*	VU
Yellow Striped Reed Frog	*Hyperolius semidiscus*	VU
Plain Stream Frog	*Strongylopus wageri*	VU
Giant Bullfrog	*Pyxicephalus adspersus*	VU
Greater Leaf-Folding Frog	*Afrixalus fornasini*	VU
Whistling Rain Frog	*Breviceps sopranus*	VU

VU= Vulnerable

Table 12: List of invertebrate species and their IUCN Red List Category (De Wet, 2002) as listed in the Mpumalanga State of the Environment Report (2003).

Common Name	Scientific Name	Status
Rossouw's Copper	*Aloeides rossouwi*	EN
Barbara's Copper	*Aloeides barbarae*	EN
Swanepoel's Blue	*Lepidochrysops swanepoeli*	EN
Jeffery's Blue	*Lepidochrysops jefferyi*	EN
Stoffberg Widow	*Dingana fraterna*	EN
Marsh Sylph*	*Metisella meninx*	VU
Cloud Copper	*Aloeides nubilus*	VU
Catshead Sprite - Coenagrionidae	*Pseudagrion coeleste*	CR
Balinsky's Sprite - Coenagrionidae	*Pseudagrion inopinatum*	VU

Newton's Sprite - Coenagrionidae	*Pseudagrion newtoni*	VU
Sjostedt's Sprite - Coenagrionidae	*Pseudagrion sjoestedti pseudojoestedti*	CR
Elliot's Hawker-Aeshnidae	*Aeshna ellioti usambarica*	VU
Unicorn Cruiser - Corduliidae	*Phyllomacromia monoceros*	CR

EN= Endangered; CR= Critically Endangered; VU= Vulnerable; P = Protected

Table 13: Avifaunal Species for the pentad 2525_3130, and 2530_3130 within the QDS 2531BC & 2531DA.

PENTADS	LINK TO PENTAD SUMMARY ON THE SOUTH AFRICAN BIRD ATLAS PROJECT 2 WEB PAGE
2525_3130	http://sabap2.adu.org.za/coverage/pentad/2525_3130
2530_3130	http://sabap2.adu.org.za/coverage/pentad/2530_3130

Table 14: Schedule 1 - SPECIALLY PROTECTED GAME (SECTION 4 (1) (a)) (MNCA)

Common name	Scientific name
Elephant	*Loxodonta africana*
All species of rhinoceros	all species of the Family Rhinocerotidae

Table 15: Schedule 2 - PROTECTED GAME (SECTION 4 (1) (b)) (MNCA)

Common name	Scientific name
AMPHIBIANS, REPTILES AND MAMMALS	
Bullfrog	Pyxicephalus adspersus
All species of reptiles excluding the water leguan, rock leguan and all species of snakes	All species of the Class Reptilia excluding *Varanus niloticus*, *Varanus exanthematicus* and all species of the Sub Order Serpentes
Riverine Rabbit	*Bungolagus monticularis*
Hedgehog	*Atelerix frontalis*
Samango Monkey	*Cercophithecus mitis*
Bushbaby	*Otolemur crassicaudatus*
Lesser Bushbaby	*Galago moholi*
Honey-Badger	*Mellivora capensis*
Pangolin	*Manis temminckii*
Aardwolf	*Proteles cristatus*
Cape Hunting Dog	*Lycaon pictus*
Brown Hyaena	*Hyaena brunnea*
Antbear	*Orycteropus afer*
Mountain Zebra	*Equus zebra*
Hartmann's Zebra	*Equus zebra hartmannae*
Hippopotamus	*Hippopotamus amphibius*
Giraffe	*Giraffa camelopardalis*
Nyala	*Tragelaphus angasi*
Red Duiker	*Cephalophus natalensis*
Blue Duiker	*Philantomba monticola*
Reedbuck	*Redunca arundinum*
Mountain Reedbuck	*Redunca fulvorufula*
Sable Antelope	*Hippotragus niger*
Roan Antelope	*Hippotragus equinus*
Black Wildebeest	*Connochaetes gnou*
Tsessebe	*Damaliscus lunatus*
Lichtenstein's Hartebeest	*Alcelaphus lichtensteinii*
Klipspringer	*Oreotragus oreotragus*
Oribi	*Ourebia ourebi*
Steenbok	*Raphicerus campestris*
Sharpe's Grysbok	*Raphicerus sharper*
Suni	*Neotragus moschatus*
Grey Rhebok	*Pelea capreolus*

Common name	Scientific name
Eland	*Taurotragus oryx*
Waterbuck	*Kobus ellipsiprymnus*
Cape Clawless Otter	*Aonyx capensis*
Spotted Necked Otter	*Lutra maculicollis*
BIRDS	
Any bird which is a wild animal, excluding a bird referred to in Schedule 3, and the -	
White Breasted Cormorant	*Phalacrocorax lucidus*
Reed Cormorant	*Phalacrocorax africanus*
Red-Eyed Turtle Dove	*Streptopelia semitorquata*
Cape Turtle Dove	*Streptopelia capicola*
Laughing Dove	*Streptopelia senegalensis*
all species of mousebirds	all species of the Family Colidae
Pied Crow	*Corvus albus*
Black Crow	*Corvus capensis*
Red-Eyed Bulbul	*Pycnonotus nigricans*
Black-Eyed Bulbul	*Pycnonotus barbatus*
Red-Winged Starling	*Onychognathus morio*
Cape Sparrow	*Passer melanurus*
Spotted-Backed Weaver	*Ploceus cucullatus*
Cape Weaver	*Ploceus capensis*
Masked Weaver	*Ploceus velatus*
Red-Billed Quelea	*Quelea quelea*
Red Bishop	*Euplectes orix*

Table 16: Schedule 4 - PROTECTED WILD ANIMALS (SECTION 4 (1) (d)) (MNCA)

Common name	Scientific name
Spotted hyaena	*Crocuta crocuta*
Cheetah	*Acinonyx jubatus*
Leopard	*Panthera pardus*
Lion	*Panthera Leo*
African buffalo	*Syncerus caffer*

Table 17: Schedule 5 - WILD ANIMALS TO WHICH THE PROVISIONS OF SECTION 33 APPLY (MNCA)

Common name	Scientific name
Water Monitor Lizard	*Varanus niloticus*
White throated rock monitor lizard	*Varanus exanthematicus*
All species of snakes	all species of the Sub Order Serpentes
Any bird which is a wild animal but which is not game, excluding the ostrich	*Struthio camelus*
Chacma Baboon	*Papio ursinus*
Vervet Monkey	*Cercophitecus mitis*
All Dassies	Family: Procaviidae
All Mongooses	Family: Viverridae
Tree Squirrel	*Paraxerus cepapi*
Warthog	*Phacochoerus aethiopicus*
Serval	*Felis serval*
Civet	*Civettictis civetta*
Cape Fox	*Vulpes chama*
Side Striped Jackal	*Canis adustus*
All Genets	*Genetia* spp.
Springhare	*Pedetes capensis*
African Wild Cat	*Felis lybica*

Table 18: Schedule 7 - INVERTEBRATES (SECTION 35 (1)) (MNCA)

Common name	Scientific name
All species of baboon spiders belonging to the genera referred to hereby	*Ceratogyrus* spp., *Harpactira* spp. and *Pterinochilus* spp.

Numerous faunal SCC are expected to occur within the Mpumalanga Province. Based on digital signatures it is evident that a watercourse is present within the focus area. This watercourse could be identified as sensitive and of increased importance providing more foraging and breeding opportunity for faunal species common and SCC. A site visit will have to be undertaken to determine whether any faunal SCC will occur within the focus area, especially within the watercourse habitat, or within close proximity to the focus area. Should any development activities take place care should be taken to avoid collision with these species (SSC listed as threatened by the IUCN and Mpumalanga Nature Conservation Act are of particular concern). Hunting and trapping of faunal species (common and SCC) are prohibited and if any faunal species are encountered within the focus area it should be rescued and relocated to similar suitable habitat within the vicinity of the focus area. With the Kruger National Park located within 2 km of the focus area the likelihood of avifaunal SCC migrating between the KNP and surrounding areas, including the focus area, or utilising the surrounding areas for foraging is high. This will however have to be confirmed with a site visit from a suitably qualified specialist.

4 IMPACT ASSESSMENT

The tables below serve to summarise the significance of potential impacts on terrestrial habitat that may result due to proposed development activities from a desktop basis. In addition, it also indicates the required mitigatory and management measures required to minimise potential ecological impacts and presents an assessment of the significance of the impacts taking into consideration the available mitigatory measures, assuming that they are fully implemented.

The following essential mitigation measures are considered to be standard best practice measures applicable to activities of this nature, in conjunction with those stipulated in the individual tables in the following sections, which define the mitigatory measures specific to the minimisation of impacts on natural resources within the focus area.

Project footprint

- It is highly recommended that any development activities near natural undisturbed areas, if present within the focus area, or within the watercourse located within the focus area, should be avoided or minimised as far as possible as they are potentially regarded to be of ecological importance. Edge effects from any activities occurring in areas surrounding these habitat units must be effectively mitigated in order to prevent impacts on the areas;

- It is recommended that no development occurs within the watercourse or its regulated zone, should this not be feasible, a water use licence application process can be applied for to allow development within the regulated zone. A watercourse assessment will need to be conducted to determine the extent of the watercourse, thereafter determining the potential development constraints and required authorisations;
- All footprint areas should remain as small as possible and should not encroach onto surrounding areas beyond the necessary areas. It must be ensured that watercourses, if any, beyond the approved development footprint are off-limits to vehicles and personnel;
- The boundaries of footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas. Edge effects will need to be extremely carefully controlled if the project is to proceed;
- Planning of temporary roads and access routes should avoid natural areas and be restricted to existing gravel roads where possible;
- Appropriate sanitary facilities must be provided for the life of the proposed construction activities and all waste removed to an appropriate waste facility; and
- No fires should be permitted in or near the focus area.

Alien floral species

- Alien and invasive vegetation control should take place throughout the duration of the development activities;
- Proliferation of alien and invasive species is expected within any disturbed area. These species should be eradicated and controlled to prevent their spread beyond the footprint. Alien plant seed dispersal within the top layers of the soil within footprint areas, that will have an impact on future rehabilitation, has to be controlled; and
- Removal of the alien and weed species encountered within the footprint area must take place in order to comply with existing legislation (amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 and Section 28 of the National Environmental Management Act, 1998).

SCC and Protected floral and faunal species

- Prohibit the collection of plant material for firewood or medicinal uses;
- Should any SCC or other protected floral and faunal species be encountered within the focus area, the following should be ensured:
  - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas;

- Permit applications should be obtained from the relevant authorities where applicable; and
- A suitably qualified specialist should oversee all rescue and relocation plans;

➢ No trapping or hunting of fauna is to take place.

Vehicle maintenance

➢ All vehicles must be regularly inspected for leaks. Re-fuelling must take place on a sealed surface area to prevent ingress of hydrocarbons into topsoil;

➢ In the event of a vehicle breakdown, maintenance of vehicles must take place with care and the recollection of spillage should be practiced near the surface area to prevent ingress of hydrocarbons into topsoil and subsequent habitat loss; and

➢ All spills should be immediately cleaned up and treated accordingly.

Watercourses

➢ If any activity is to take place within the proximity of the watercourse and associated regulated zone, the extent of encroachment will need to be extremely well controlled and limited. Appropriate mitigation and well managed systems will need to be implemented to prevent potential impact on water quality and quantity within and adjacent to the watercourse areas. Overall however, activities within watercourses should be avoided as far as possible; and

➢ Should any activities be proposed within the watercourses and associated regulated zones, including rehabilitation, this must be authorised by the Department of Water and Sanitation (DWS) in terms of Section 21 (c) & (i) of the National Water Act (Act 36 of 1998).

Soils

➢ Sheet runoff from access roads should be slowed down by the strategic placement of berms;

➢ Should any active erosion be observed, measures to rehabilitate such areas should be implemented; and

Rehabilitation

➢ Rehabilitate all disturbed areas that may be impacted by the proposed development activities to ensure that the ecology and functionality of these areas are re-instated. Rehabilitation should also ensure the prevention of any potential latent impacts on the area;

➢ As much vegetation growth as possible should be retained around the focus area in order to protect soils; and

All alien vegetation in the vicinity of the focus area should be removed regularly throughout the life of the activities and reseeded with a climate appropriate veld reclamation mix.

4.1 Impact 1: Impact on Floral Species of Conservation Concern

For the purpose of this study, the key activities associated with development activities that may affect the ecology of the area include:

- The utilisation of temporary tracks to the footprint areas;
- Vegetation clearing for the site establishment;
- Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment;
- Site levelling;
- Trenching for the establishment of the gas pipeline, should the proposed gas pipeline be underground; and
- Digging for the pylons of the powerlines.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Unmanaged	4	4	3	2	3	8	8	64 (Medium-low)

Essential mitigation measures:

- A walkdown/active search for Floral SCC must be conducted within the focus area prior to any activities taking place.
- Floral SCC encountered within the footprint, are to be either protected *in situ* or relocated as appropriate. This specifically relates to species which can potentially be successfully rescued and relocated, provided that permit application for the disturbance of these protected species is approved;
- Keep the proposed development footprint as small as possible;
- As far as possible development within sensitive habitat units must be avoided;
- All disturbed areas must be concurrently rehabilitated during construction of access roads and vegetation clearing for temporary contractors laydown areas;
- The existing integrity of flora surrounding the focus area should be upheld and no activities should occur outside the footprint area; and
- Edge effect control needs to be implemented to avoid further habitat degradation outside of the proposed footprint area.

Recommended mitigation measures:

- All sensitive areas are to be demarcated and access into these areas should minimised as far as possible.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Managed	3	4	2	2	2	7	6	42 (Low)

Probable latent impacts:

- If inadequately controlled activities takes place within any sensitive habitat units permanent loss of floral SCC will potentially occur; and
- Permanent loss of SCC habitat and SCC individuals.

4.2 Impact 2: Impact on Faunal Species of Conservation Concern

For the purpose of this study, the key activities associated with the proposed development activities that may affect the ecology of the focus area include:

- The utilisation of temporary tracks to the footprint areas;
- Vegetation clearing for the site establishment;
- Alien species proliferation due to edge effects caused by vegetation clearing for access roads and site establishment;
- Site levelling;
- Trenching for the establishment of the gas pipeline, should the proposed gas pipeline be underground; and
- Digging for the pylons of the powerlines.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Unmanaged	4	4	3	2	3	8	8	64 (Low)

Essential mitigation measures:

- The proposed development footprint areas should remain as small as possible and where possible be confined to already disturbed areas;
- As far as possible development within sensitive habitat units must be avoided;
- Edge effects of all development activities, such as erosion and alien plant species proliferation, which may affect faunal habitat within surrounding areas, need to be strictly managed;
- All disturbed areas must be concurrently rehabilitated;
- All informal fires in the vicinity of the development footprint should be prohibited; and
- No trapping or hunting of fauna is to take place.

Recommended mitigation measures:

- It is recommended that a speed limit of 40km/h be implemented on all roads running through the focus area in order to minimise risk to SCC and other fauna from vehicles.

Management	Probability of Impact	Sensitivity of receiving environment	Severity	Spatial scale	Duration of impact	Likelihood	Consequence	Significance
Managed	3	4	2	2	2	7	6	42 (Low)

Probable latent impacts

- If development takes place within the sensitive Habitat Units permanent loss of faunal SCC carrying capacity will potentially occur.

4.3 Impact Assessment Conclusion

Based on the above impact assessment it is evident that there are two possible key impacts associated with the proposed development activity from a biodiversity and freshwater resource management point of view. The tables below summarise the findings, indicating the significance of the impacts before management takes place and the likely impact if management and mitigation takes place. From the tables it is evident that the development activities will have Medium-low impacts on the faunal and floral ecology prior to mitigation. With mitigation measures fully implemented and managed, the impacts can be reduced to Low.

Table 19: A summary of the results obtained from the assessment of watercourse, floral and faunal ecological impacts arising from development activities.

Impact	Unmanaged	Managed
1: Impact of floral species of conservational concern	Medium-low	Low
2: Impact of faunal species of conservational concern	Medium-low	Low

5 CONCLUSION

Scientific Terrestrial Services (STS) was appointed to conduct a desktop terrestrial biodiversity assessment as part of the environmental assessment and authorisation process for the proposed development of a Busbar extension, power station, associated powerline and a gas pipeline, in Komatipoort, Mpumalanga Province (hereafter collectively referred to as “focus area”).

Based on the preliminary desktop assessment, the focus area falls within an ecosystem of least concern, namely the Thsokwane-Hlane Basalt Lowveld. The focus area is not located within a protected area, however, it is situated approximately 2 km south of the Kruger National Park. According to the Mpumalanga Biodiversity Sector Plan (MBSP, 2014) the north eastern portion of the focus area is located within an ESA local corridor, and a small portion of the power station and the majority of the proposed gas pipeline is located within an irreplaceable CBA. The remaining portions of the focus area is located within areas classified as either “heavily modified” or “other natural areas”.

According to the National web based environmental screening tool (2020), the southern and a portion in the north east of the focus area has a very high terrestrial sensitivity. The focus area is considered to have a medium sensitivity for plant species due to the potential presence of the *Pavetta zeyheri subsp. microlancea*. For the Animal Species theme, the majority of the focus area is considered to have a medium sensitivity due to the potential presence of sensitive species such as Aves – *Circus ranivorus* (African marsh harrier) and *Sagittarius serpentarius* (Secretarybird). Scattered portions throughout the focus area is considered to be of high animal sensitivity due to sensitive species such as Aves – *Ephippiorhynchus senegale* (saddle-billed stork). A field assessment will have to be undertaken to verify the current sensitivity of the habitat as well as the presence of the floral and faunal species within the focus area.

Following the desktop analysis of the biodiversity associated with the focus area, it is determined that a full biodiversity assessment will need to be undertaken to determine the sensitivity and the potential impacts to the focus area should the proposed development receive Environmental Authorisation.

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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 seasonality, time and budgetary constraints relevant to the type and level of investigation undertaken as well as the project program and STS CC and its staff, at their sole discretion, reserve the right to 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 598 Alien and Invasive Species Regulations (2014), including the Government Notice No. 1003 Alien Invasive Species List as published in the Government Gazette 43726 of 2020, 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. This act in terms of alien and invasive species aims to:

- Prevent the unauthorised 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 NEMBA 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, 2014):

- **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.

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.

The Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998) (MNCA)

The Mpumalanga Nature Conservation Act (MNCA; Act 10 of 1998) provides for the protection of indigenous plants. Subject to the provisions of this Act, no person shall:

- Pick, be in possession of, sell, purchase, donate, receive as a gift, import into, export or remove from the Province, or convey:
  - A specially protected plant; or
  - A protected plant.
- Pick any indigenous plant:
  - On a public road;
  - On land next to a public road within 100m measured from the centre of the road;
  - Within an area bordering any natural watercourse, whether wet or dry, up to and within a distance of 50m from the high watermark on either side of the natural watercourse; or
  - In a Provincial Park, a site of Ecological Importance or a Protected Natural Environment.

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

- Schedule 1: Specifically Protected Game (Section 4 (1) (a));
- Schedule 2: Protected Game (Section 4 (1) (b));
- Schedule 4: Protected Wild Animals (Section 4 (1) (d));
- Schedule 7: Invertebrates (Section 35 (1));
- Schedule 11: Protected Plants (Section 69 (1) (a)); and
- Schedule 12: Specifically Protected Plants (Section 69 (1) (b)).

APPENDIX C: Ecological Impact Assessment Methodology

In order for the EAP to allow for sufficient consideration of all environmental impacts, impacts were assessed 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 are possessed by an organisation.
- An **environmental aspect** is an 'element of an organizations activities, products and services which can interact with the environment'[5]. 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 well-being, 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 below. 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[6].

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 takes into account the recommended management measures required to mitigate the impacts. Measures such as demolishing infrastructure, and reinstatement and rehabilitation of land, are considered post-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 (No. 108 of 1997) in instances of uncertainty or lack of information, by

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

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

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 features affected < 100m	1
Development specific / within the site boundary / < 100ha impacted / Linear features affected < 1000m	2
Local area / within 1 km of the site boundary / < 2000ha impacted / Linear features affected < 3000m	3
Regional within 5 km of the site boundary / < 5000ha impacted / Linear features affected < 10 000m	4
Entire habitat unit / Entire system / > 5000ha impacted / Linear features affected > 10 000m	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.

	CONSEQUENCE (Severity + Spatial Scope + Duration)														
LIKELIHOOD (Frequency of activity + Frequency of impact)	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	Consider the viability of the project. Very strict measures to be implemented to mitigate impacts according to the impact mitigation hierarchy	Actively promote the project
High	101 - 125	Consider alternatives in terms of project execution and location. Ensure designs take environmental sensitivities into account and Ensure management and housekeeping is maintained and attention to impact minimisation is paid according to the impact mitigation hierarchy	Promote the project and monitor ecological performance
Medium High	76 – 100	Consider alternatives in terms of project execution and Ensure management and housekeeping is maintained and attention to impact minimisation is paid according to the impact mitigation hierarchy	Implement measures to enhance the ecologically positive aspects of the project while managing any negative impacts
Medium Low	51 - 75	Ensure management and housekeeping is maintained and attention to impact minimisation is paid	Implement measures to enhance the ecologically positive aspects of the project while actively managing any negative impacts
Low	26 - 50	Promote the project and ensure management and housekeeping is maintained	Monitor ecological performance and pay extensive attention to minimising potential negative environmental impacts
Low Very	1 - 25	Promote the project	Actively seek measures to implement impact minimisation according to the impact mitigation hierarchy and identify positive ecological aspects to be promoted

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 further planned development of the project, 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:
  - Infill activities
  - Rehabilitation
- 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.

APPENDIX D: Vegetation Type

Tshokwane-Hlane Basalt Lowveld (SVI5)

Figure D1: SVI 5 Tshokwane-Hlane Basalt Lowveld: Deciduous closed woodland occurring on clay flats with *Acacia gerrardii, A. tortilis, Combretum hereroense* and *C. imberbe* looking over the Nwanetsi River, Kruger National Park (Mucina & Rutherford, 2006, Figure 9.48)

Table D1: Dominant & typical floristic species of the Granite Lowveld (Mucina & Rutherford, 2012)

Group	Species
WOODY SPECIES	
Tall trees	*Acacia nigrescens (d), Sclerocarya birrea subsp. caffra (d), Philenoptera violacea*
Small trees	*Acacia borleae, A. gerrardii, A. nilotica, A. tortilis subsp. heteracantha, Albizia harveyi, Combretum hereroense, C. imberbe, Lannea schweinfurthii var. stuhlmannii, Peltophorum africanum, Pterocarpus rotundifolius*
Tall shrubs	*Dichrostachys cinerea, Grewia bicolor, Gymnosporia maranguensis, Rhus gueinzii.*
Low shrubs	*Acalypha segetalis, Dicoma tomentosa, Hermannia glanduligera, Justicia flava, J. protracta subsp. protracta, Seddera suffruticosa, Tragia dioica, Boscia foetida subsp. minima* (endemic)
HERBACEOUS SPECIES	
Herbaceous climber	*Commicarpus plumbagineus*
Herb	*Chamaecrista mimosoides, Gisekia africana, Thunbergia dregeana*
Succulent herbs	*Aloe zebrina, Orbea paradoxa, O. rogersii.*
GRAMINOID SPECIES	
Graminoids	*Bothriochloa radicans (d), Digitaria eriantha subsp. eriantha (d), Panicum coloratum (d), P. maximum (d), Themeda triandra (d), Urochloa mosambicensis (d), Aristida congesta, Cenchrus ciliaris, Eragrostis superba, Heteropogon contortus.*

***(d) – Dominant species for the vegetation type**

APPENDIX E: Details, Expertise And Curriculum Vitae of Specialists

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

Sanja Erwee	BSc Zoology (University of Pretoria)
Nelanie Cloete	MSc Botany and Environmental Management (University of Johannesburg)

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

Company of Specialist:	Scientific Terrestrial Services		
Name / Contact person:	Nelanie Cloete		
Postal address:	PO. Box 751779, Gardenview		
Postal code:	2047	Cell:	084 311 4878
Telephone:	011 616 7893	Fax:	086 724 3132
E-mail:	Nelanie@sasenvgroup.co.za		
Qualifications	MSc Environmental Management (University of Johannesburg) MSc Botany (University of Johannesburg) BSc (Hons) Botany (University of Johannesburg) BSc (Botany and Zoology) (Rand Afrikaans University)		
Registration / Associations	Professional member of the South African Council for Natural Scientific Professions (SACNASP) Member of the South African Association of Botanists (SAAB) Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group Member of the Grassland Society of South Africa (GSSA)		

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

I, Sanja Erwee, declare that -

- I act as the **independent specialist** in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the 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, Nelanie Cloete (reviewer), 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 NELANIE CLOETE

PERSONAL DETAILS

Position in Company	Senior Scientist, Member Botanical Science and Terrestrial Ecology
Joined SAS Environmental Group of Companies	2011

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Professional member of the South African Council for Natural Scientific Professions (SACNASP – Reg No. 400503/14)
Member of the South African Association of Botanists (SAAB)
Member of the International Affiliation for Impact Assessments (IAIAsa) South Africa group
Member of the Grassland Society of South Africa (GSSA)
Member of the Botanical Society of South Africa (BotSoc)
Member of the Gauteng Wetland Forum (GWF)

EDUCATION

Qualifications

MSc Environmental Management (University of Johannesburg)	2013
MSc Botany (University of Johannesburg)	2007
BSc (Hons) Botany (University of Johannesburg)	2005
BSc (Botany and Zoology) (Rand Afrikaans University)	2004

Short Courses

Certificate – Department of Environmental Science in Legal context of Environmental Management, Compliance and Enforcement (UNISA)	2009
Introduction to Project Management - Online course by the University of Adelaide	2016
Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, focusing on WULAs and IWWMPs	2017

AREAS OF WORK EXPERIENCE

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

KEY SPECIALIST DISCIPLINES

Biodiversity Assessments

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

Freshwater Assessments

- Desktop Freshwater Delineation
- Freshwater Verification Assessment
- Freshwater (wetland / riparian) Delineation and Assessment
- Freshwater Eco Service and Status Determination
- Rehabilitation Assessment / Planning
- Plant species and Landscape Plan

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

SAS ENVIRONMENTAL GROUP OF COMPANIES – SPECIALIST CONSULTANT INFORMATION CURRICULUM VITAE OF SANJA ERWEE

PERSONAL DETAILS

Position in Company	GIS Technician and Visual Specialist
Joined SAS Environmental Group of Companies	2014

EDUCATION

Qualifications

BSC Zoology (University of Pretoria)	2013

Short Courses

Global Mapper	2015
SANBI BGIS Course	2017
Global Mapper Lidar Course	2017
ESRI MOOC ARCGIS Cartography	2018

AREAS OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Northern Cape, Western Cape Free State

KEY SPECIALIST DISCIPLINES

Freshwater Assessments

- Desktop Freshwater Delineation
- Plant species and Landscape Plan

Visual Impact Assessment

- Visual Baseline and Impact Assessments
- Visual Impact Peer Review Assessments
- View Shed Analyses
- Visual Modelling

GIS

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