ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED ESKOM -SIYATHEMBA 88KV LINE LOOP IN, LOOP OUT AND SUBSTATION:

FAUNA & FLORA SPECIALIST REPORT FOR BASIC ASSESSMENT

PRODUCED FOR NSOVO

ON BEHALF OF ESKOM DISTRIBUTION

BY

3Foxes Biodiversity Solutions

Simon.Todd@3foxes.co.za

March 2018

CONTENTS

NEMA 2014 CHECKLIST

Section		*NEMA 2014 Regulations for Specialist Studies*	Position in report (pg.)	check
1	1	A specialist report prepared in terms of these Regulations must contain—		
	(a)	details of-		
		(i) the specialist who prepared the report; and	4-5	✓
		(ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;		
	(b)	a declaration that the person is independent in a form as may be specified by the competent authority;		✓
	(c)	an indication of the scope of, and the purpose for which, the report was prepared;	6	✓
	(d)	a description of the methodology adopted in preparing the report or carrying out the specialised process;	8-10	✓
	(e)	a description of any assumptions made and any uncertainties or gaps in knowledge;	8	✓
	(f)	a description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment;	10-17	✓
	(g)	recommendations in respect of any mitigation measures that should be considered by the applicant and the competent authority;	20-23	✓
	(h)	a description of any consultation process that was undertaken during the course of carrying out the specialist report;	See main EIA report	✓
	(i)	a summary and copies of any comments that were received during any consultation process; and	See main EIA report	✓
	(j)	any other information requested by the competent authority.		
	2	Where a proposed development and the geographical area within which it is located has been subjected to a pre-assessment using a spatial development tool, and the output of the pre-assessment in the form of a site specific development protocol has been adopted in the prescribed manner, the content of a specialist report may be determined by the adopted site specific development protocol applicable to the specific proposed development in the specific geographical area it is proposed in.	N/A	✓

PROFESSIONAL PROFILE OF CONSULTANT:

Simon Todd is Director of 3Foxes Biodiversity Solutions and has extensive experience in biodiversity assessment, having provided ecological assessments for more than 150 different developments including a large number of power line developments. Simon Todd is a recognised ecological expert and is a past chairman of the Arid-Zone Ecology Forum and has 20 years' experience working throughout the country. Simon Todd is registered with the South African Council for Natural Scientific Professions (No. 400425/11).

Recent experience and relevant projects include the following:

- Vryheid Grid Strengthening Project, near Swellendam. Nsovo Environmental Consultants. 2016.
- Juno-Gromis 400kV Power Line. Ecological Walk-Through study for EMPr. Nsovo Environmental Consultants. 2017.
- Proposed Weskusfleur Substation at Koeberg. Lidwala Consulting Engineers. 2015.
- Proposed Juno-Aurora 765kV Power Line in the Western Cape: Fauna & Flora Specialist Report for Impact Assessment. Nzumbululo Heritage Solutions 2015.
- The proposed Mookodi Integration Phase 2 132kV Power Lines and Ganyesa Substation near Vryburg, North West Province: Fauna & Flora Specialist Basic Assessment Report. Sivest 2014.
- Burchell-Caprum-Mooidraai 132kV Power Line - Fauna & Flora Specialist Report for Basic Assessment. Savannah Environmental 2014.
- Proposed Re-Alignment of The Koeberg – Ankerlig VPower Line: Fauna & Flora Specialist Report for Basic Assessment. Savannah Environmental 2014.
- Grid Connection for Mainstream South Africa Perdekraal Wind Energy Facility. Fauna & Flora Specialist Report for Basic Assessment. ERM 2014.
- Karoshoek Grid Integration Infrastructure. Fauna & Flora Specialist Report for Basic Assessment. Specialist Report for Savannah Environmental. 2012.
- Proposed Kappa-Omega 765 kV Transmission Line. Fauna, Flora & Ecology Walk-Through Report. Specialist Report for ACER Africa. 2013.

1 INTRODUCTION

Eskom Holdings SOC Limited proposes the development of two 1km 88kV loop in loop out power-lines from Burnstone 88kV powerline to the proposed Siyathemba switching station in order to meet electricity demand in the area. Nsovo Environmental Consultants are conducting the required Basic Assessment process for the above development and has appointed 3Foxes Biodiversity Solutions to contribute the terrestrial biodiversity component of the BA. As part of this process, this ecological specialist study details the ecological characteristics of the power line loop corridors and substation alternatives and provides an assessment of the likely ecological impacts likely to be associated with the development of the proposed development. Impacts are assessed for the preconstruction, construction, operation, and decommissioning phases of the development. A variety of avoidance and mitigation measures associated with each identified impact are recommended to reduce the likely impact of the development which should be included in the EMPr for the development. The full scope of study is detailed below.

1.1 SCOPE OF STUDY

The scope of the study includes the following activities

- a description of the environment that may be affected by the activity and the manner in which the environment may be affected by the proposed project
- a description and evaluation of environmental issues and potential impacts (including using direct, indirect and cumulative impacts) that have been identified
- a statement regarding the potential significance of the identified issues based on the evaluation of the issues/impacts
- an indication of the methodology used in determining the significance of potential environmental impacts
- an assessment of the significance of direct indirect and cumulative impacts in terms of the following criteria :

    - the nature of the impact, which shall include a description of what causes the effect, what will be affected and how it will be affected
    - the extent of the impact, indicating whether the impact will be local (limited to the immediate area or site of development), regional, national or international
    - the duration of the impact, indicating whether the lifetime of the impact will be of a short-term duration (0-5 years), medium-term (5- 15 years), long-term (> 15 years, where the impact will cease after the operational life of the activity) or permanent
    - the probability of the impact, describing the likelihood of the impact actually occurring, indicated as improbable (low likelihood) probable (distinct

possibility), highly probable (most likely), or definite (Impact will occur regardless of any preventable measures)
    - the severity/beneficial scale indicating whether the impact will be very severe/beneficial (a permanent change which cannot be mitigated/permanent and significant benefit with no real alternative to achieving this benefit) severe/beneficial (long-term impact that could be mitigated/long-term benefit) moderately severe/beneficial (medium- to long-term impact that could be mitigated/ medium- to long-term benefit), slight or have no effect
    - the significance which shall be determined through a synthesis of the characteristics described above and can be assessed as low medium or high
    - the status which will be described as either positive, negative or neutral
    - the degree to which the impact can be reversed
    - the degree to which the impact may cause irreplaceable loss of resources
    - the degree to which the impact can be mitigated

- a description and comparative assessment of all alternatives
- recommendations regarding practical mitigation measures for potentially significant impacts, for inclusion in the Environmental Management Programme (EMPr)
- an indication of the extent to which the issue could be addressed by the adoption of mitigation measures
- a description of any assumptions uncertainties and gaps in knowledge
- an environmental impact statement which contains :
    - a summary of the key findings of the environmental impact assessment;
    - an assessment of the positive and negative implications of the proposed activity;
    - a comparative assessment of the positive and negative implications of identified alternatives

1.2 ASSESSMENT APPROACH & PHILOSOPHY

The assessment will be conducted according to the 2017 amended EIA Regulations as well as within the best-practice guidelines and principles for biodiversity assessment as outlined by Brownlie (2005) and De Villiers et al. (2005).

This includes adherence to the following broad principles:

- That a precautionary and risk-averse approach be adopted towards projects which may result in substantial detrimental impacts on biodiversity and ecosystems, especially the irreversible loss of habitat and ecological functioning in threatened ecosystems or designated sensitive areas: i.e. Critical Biodiversity Areas (as identified by systematic conservation plans, Biodiversity Sector Plans or Bioregional Plans) and Freshwater Ecosystem Priority Areas.

- Demonstrate how the proponent intends complying with the principles contained in section 2 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA), which, amongst other things, indicates that environmental management should:

    - In order of priority aim to: avoid, minimise or remedy disturbance of ecosystems and loss of biodiversity;
    - Avoid degradation of the environment;
    - Avoid jeopardising ecosystem integrity;
    - Pursue the best practicable environmental option by means of integrated environmental management;
    - Protect the environment as the people's common heritage;
    - Control and minimise environmental damage; and
    - Pay specific attention to management and planning procedures pertaining to sensitive, vulnerable, highly dynamic or stressed ecosystems.

These principles serve as guidelines for all decision-making concerning matters that may affect the environment. As such, it is incumbent upon the proponent to show how proposed activities would comply with these principles and thereby contribute towards the achievement of sustainable development as defined by the NE MA.

In order to adhere to the above principles and best-practice guidelines, the following approach forms the basis for the study approach and assessment philosophy:
The study will include data searches, desktop studies, site walkovers / field survey of the property and baseline data collection, describing:

- A description of the broad ecological characteristics of the site and its surrounds in terms of any mapped spatial components of ecological processes and/or patchiness, patch size, relative isolation of patches, connectivity, corridors, disturbance regimes, ecotones, buffering, viability, etc.

In terms of **pattern**, the following will be identified or described:

Community and ecosystem level

- The main vegetation type, its aerial extent and interaction with neighbouring types, soils or topography;
- Threatened or vulnerable ecosystems (*cf. SA vegetation map/National Spatial Biodiversity Assessment, fine-scale systematic conservation plans, etc*).

Species level

- Red Data Book species (giving location if possible using GPS)
- The viability of an estimated population size of the RDB species that are present (include the degree of confidence in prediction based on availability of

information and specialist knowledge, i.e. High=70-100% confident, Medium 40-70% confident, low 0-40% confident)

- The likelihood of other RDB species, or species of conservation concern, occurring in the vicinity (include degree of confidence).

Fauna

- Describe and assess the terrestrial fauna present in the area that will be affected by the proposed development.
- Conduct a faunal assessment that can be integrated into the ecological study.
- Describe the existing impacts of current land use as they affect the fauna.
- Clarify species of special concern (SSC) and that are known to be:
    - endemic to the region;
    - that are considered to be of conservational concern;
    - that are in commercial trade (CITES listed species);
    - or, are of cultural significance.
- Provide monitoring requirements as input into the Environmental Management Plan (EMP) for faunal related issues.

Other pattern issues

- Any significant landscape features or rare or important vegetation associations such as seasonal wetlands, alluvium, seeps, quartz patches or salt marshes in the vicinity.
- The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).
- The condition of the site in terms of current or previous land uses.

In terms of **process**, the following will be identified or described:

- The key ecological "drivers" of ecosystems on the site and in the vicinity, such as fire.
- Any mapped spatial component of an ecological process that may occur at the site or in its vicinity (i.e. *corridors* such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and *vegetation boundaries* such as edaphic interfaces, upland-lowland interfaces or biome boundaries)
- Any possible changes in key processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.
- Furthermore, any further studies that may be required during or after the EIA process will be outlined.

- All relevant legislation, permits and standards that would apply to the development will be identified.
- The opportunities and constraints for development will be described and shown graphically on an aerial photograph, satellite image or map delineated at an appropriate level of spatial accuracy.

1.3 RELEVANT ASPECTS OF THE DEVELOPMENT

Eskom proposes the development of a loop in and loop out power line and Siyathemba switching station in order to ensure supply of electricity around Balfour. The proposed project is beneficial as it will ensure supply of electricity around Balfour and will form part of the Grootvlei 88kV network. The proposed development will be located on Farm Vlakfontein 566IR Portion 5 within the jurisdiction of Dipaleseng Local Municipality, Mpumalanga province. Two substation alternatives are being considered, which are illustrated below in Figure 1.

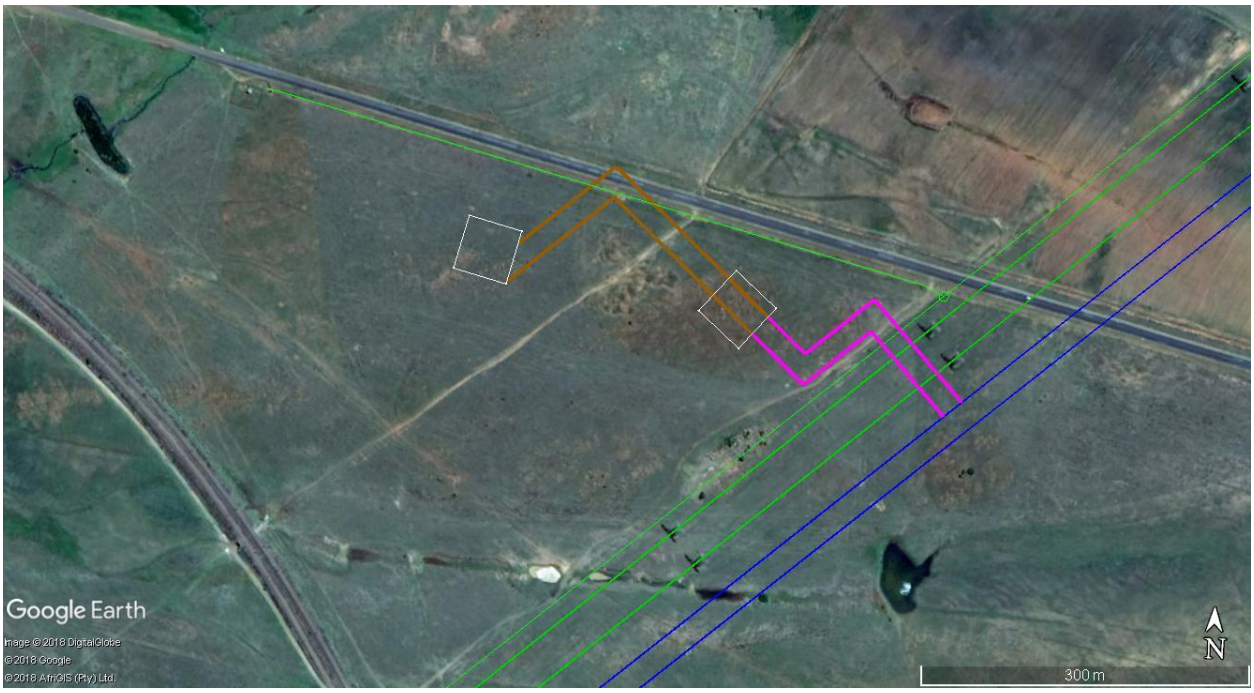

Figure 1. Map of the study area, showing the 2 alternatives considered, with Alternative 1 being the substation with the shorter lines and Alternative 2 being the option further away from the existing Burnstone 88kV line indicated in blue.

2 METHODOLOGY

2.1 DATA SOURCING AND REVIEW

Data sources from the literature consulted and used where necessary in the study includes the following:

Vegetation:

The data sources consulted and used where necessary in the study includes the following:

- Information on plant and animal species recorded for the Quarter Degree Square (QDS) 2628DA, was extracted from the SANBI POSA database. This is a considerably larger area than the study area, but this is necessary to ensure a conservative approach as the study area itself has not been well sampled in the past.
- The IUCN conservation status of the species in the list was also extracted from the database and is based on the Threatened Species Programme, Red List of South African Plants (2018).
- Critical Biodiversity Areas for the site and surroundings were extracted from the Mpumalanga Biodiversity Spatial Plan (2014)
- Threatened Ecosystem data was extracted from the National List of Threatened Ecosytems (SANBI 2011).
- Vegetation types in the area were determined based on the National Vegetation Map (Mucina and Rutherford 2006 and Powrie 2012 update).
- Freshwater and wetland information was extracted from the National Freshwater Ecosystems Protection Assessment, NFEPA (Nel et al. 2011).
- Important catchments and protected areas expansion areas were extracted from the National Protected Areas Expansion Strategy 2008 (NPAES).

Fauna

- Lists of mammals, reptiles and amphibians which are likely to occur at the site were derived based on distribution records from the literature and various spatial databases hosted by the Virtual Museum of the Animal Demograaphy Unit.
- Literature consulted includes Branch (1988) and Alexander and Marais (2007) for reptiles, Du Preez and Carruthers (2009) for amphibians, Friedmann and Daly (2004), EWT & SANBI (2016) for the South African Red Data List of mammals, and Skinner and Chimimba (2005) for mammals.
- The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as a preliminary assessment of the availability and quality of suitable habitat at the site.
- The conservation status of each species is also listed, based on the EWT 2016 Red Listing for mammals.

2.2 SITE VISIT

The site was visited on 18 March 2018 during late summer, following good summer rains leading to highly favourable conditions for the field assessment. The corridors are not very long and the entire length of the substation corridors as well as the two substation alternatives were inspected and sampled in the field. Where present, specific attention was

paid to potentially sensitive features wetlands and rocky outcrops within or near the development footprint. All plant species present along the routes and substation areas were recorded and the presence and abundance of listed and protected species were also recorded where present. Sensitive features were mapped and characterised in the field where present.

2.3 SAMPLING LIMITATIONS AND ASSUMPTIONS

The major potential limitation associated with the sampling approach is the narrow temporal window of sampling. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant and animal species present are captured. However, this is rarely possible due to time and cost constraints and therefore, the representivity of the species sampled at the time of the site visit should be critically evaluated. The site was however sampled during a favourable season the footprint was covered in detail with the result that the results are considered highly reliable and it is highly unlikely that there are any significant species or features present that were not recorded. The lists of amphibians, reptiles and mammals for the study area are based on those observed in the vicinity of the site as well as those likely to occur in the area based on their distribution and habitat preferences. This represents a sufficiently conservative and cautious approach which takes the study limitations into account.

2.4 SENSITIVITY MAPPING & ASSESSMENT

An ecological sensitivity map of the site was produced by integrating the information collected on-site with the available ecological and biodiversity information available in the literature and various spatial databases. This includes delineating the different habitat units identified in the field and assigning sensitivity values to the units based on their ecological properties, conservation value and the observed presence of species of conservation concern. The ecological sensitivity of the different units identified in the mapping procedure was rated according to the following scale:

- **Low** – Areas of natural or transformed habitat with a low sensitivity where there is likely to be a negligible impact on ecological processes and terrestrial biodiversity. Most types of development can proceed within these areas with little ecological impact.
- **Medium**- Areas of natural or previously transformed land where the impacts are likely to be largely local and the risk of secondary impact such as erosion low. These areas usually comprise the bulk of habitats within an area. Development within these areas can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.
- **High** – Areas of natural or transformed land where a high impact is anticipated due to the high biodiversity value, sensitivity or important ecological role of the area. These areas may contain or be important habitat for faunal species or provide

important ecological services such as water flow regulation or forage provision. Development within these areas is undesirable and should only proceed with caution as it may not be possible to mitigate all impacts appropriately.

- **Very High** – Critical and unique habitats that serve as habitat for rare/endangered species or perform critical ecological roles. These areas are essentially no-go areas from a developmental perspective and should be avoided as much as possible.

In some situations, areas were also classified between the above categories, such as Medium High, where it was deemed that an area did not fit well into a certain category but rather fell most appropriately between two sensitivity categories. However, it is important to note that these are **not** ranged categories such as Medium to High as this creates uncertainty as to whether an area falls at the top or the bottom of such scales.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 BROAD-SCALE VEGETATION PATTERNS

The site is restricted to the Andesite Mountain Bushveld vegetation type of the Savannah Biome (Figure 2). The only other vegetation type in the broad area is Soweto Highveld Grassland, but this is some distance from the study area.

Andesite Mountain Bushveld occurs in Gauteng, North-West, Mpumalanga and Free State in separate areas associated with the Bronberg Ridge in eastern Pretoria extending to Welbekend; from Hartebeesthoek in the west along the valley between the two parallel ranges of hills to Atteridgeville; hills in southern Johannesburg; several hills encompassing Nigel, Willemsdal, Coalbrook and Suikerbosrand and the outer ring of ridges of the Vredefort Dome as well as some hills to the northeast of Potchefstroom. It consists of a dense mediu-tall thorny bushveld with a well-developed grass layer on hills slopes and some valleys with undulating landscape. Andesite Mountain Bushveld is associated wtih Tholeitic basalt of the Klipriviervberg Group and also dark shale, micaceous sandstone and siltstone and thin coal seams. It occurs on rocky, clayier soils of mainly Mispah and Glenrosa forms with landtypes mainly Ib and Fb, with some Ba and Bb. It is classified as Least Threatened with about 7% conserved mainly in the Suikerbosrand Nature Reserve and Magaliesberg Nature Area. About 15% has been transformed, mainly through cultivation, but also some urbanisation.

Although a short species list associated with Andesite Mountain Bushveld is provided in Mucina and Rutherford (2006), this is not repeated here as the actual species present at the site are detailed in Section 3.6.

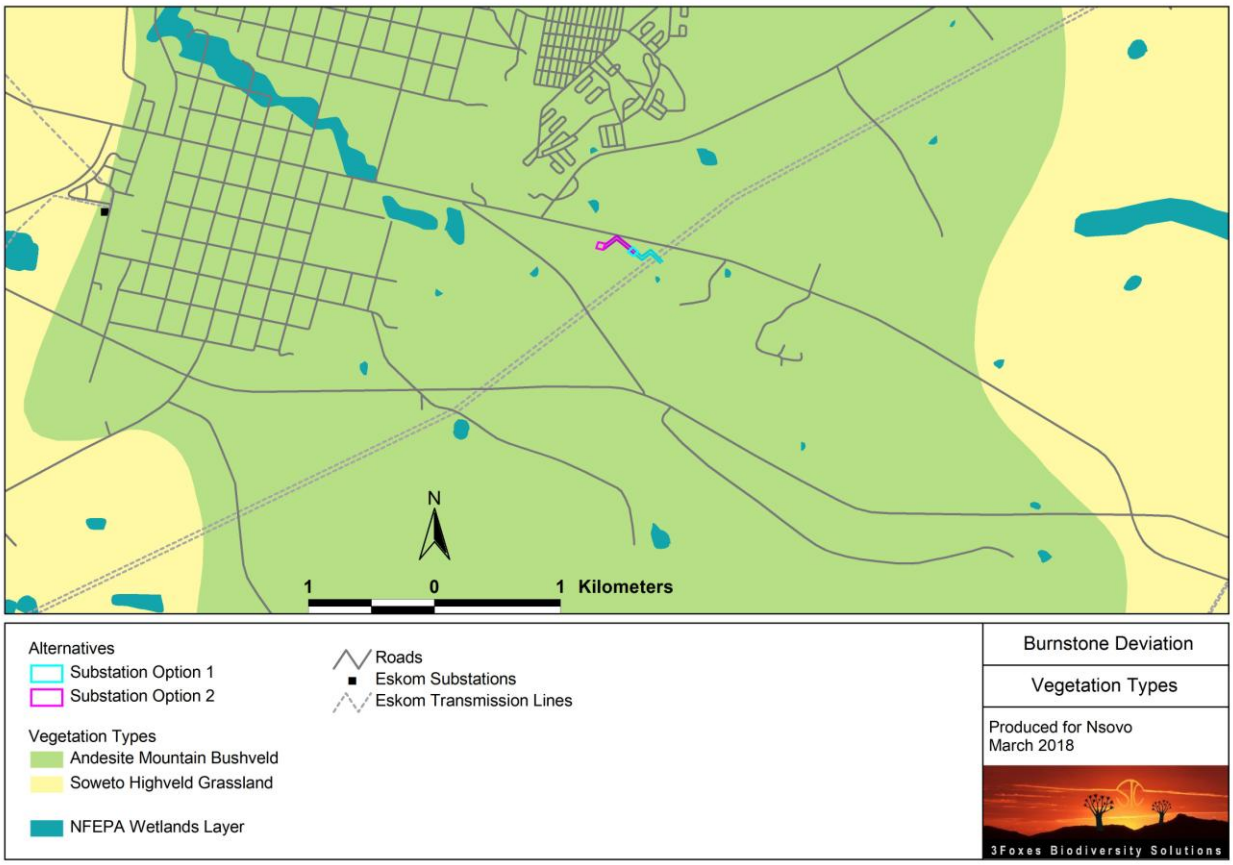

Figure 2. Vegetation map (Mucina and Rutherford 2006/2012) of the Burnstone-Siyathemba site and surrounding area.

3.2 CRITICAL BIODIVERSITY AREAS & BROAD SCALE ECOLOGICAL PROCESSES

The 2014 Mpumalanga Biodiversity Sector Plan for the study area is depicted below in Figure 3. The site lies within a Critical Biodiversity Area which forms part of the optimal design of the spatial plan. In other words, the site is not considered irreplaceable, but is required to meet vegetation targets and forms part of the optimal design of the plan, with the result that while there may be other areas that can meet the required targets, these would need to be larger than the current CBA or would not be contiguous with other required areas. Development impacts on CBAs are undesirable because this may result in a direct loss of biodiversity within the CBA or an impact on the integrity and functioning of the CBA. The footprint of the current development is however low and occurs in an area with a relatively high level of existing disturbance. The impact of the development on the affected CBA is therefore considered to be relatively low and would be of a local nature only.

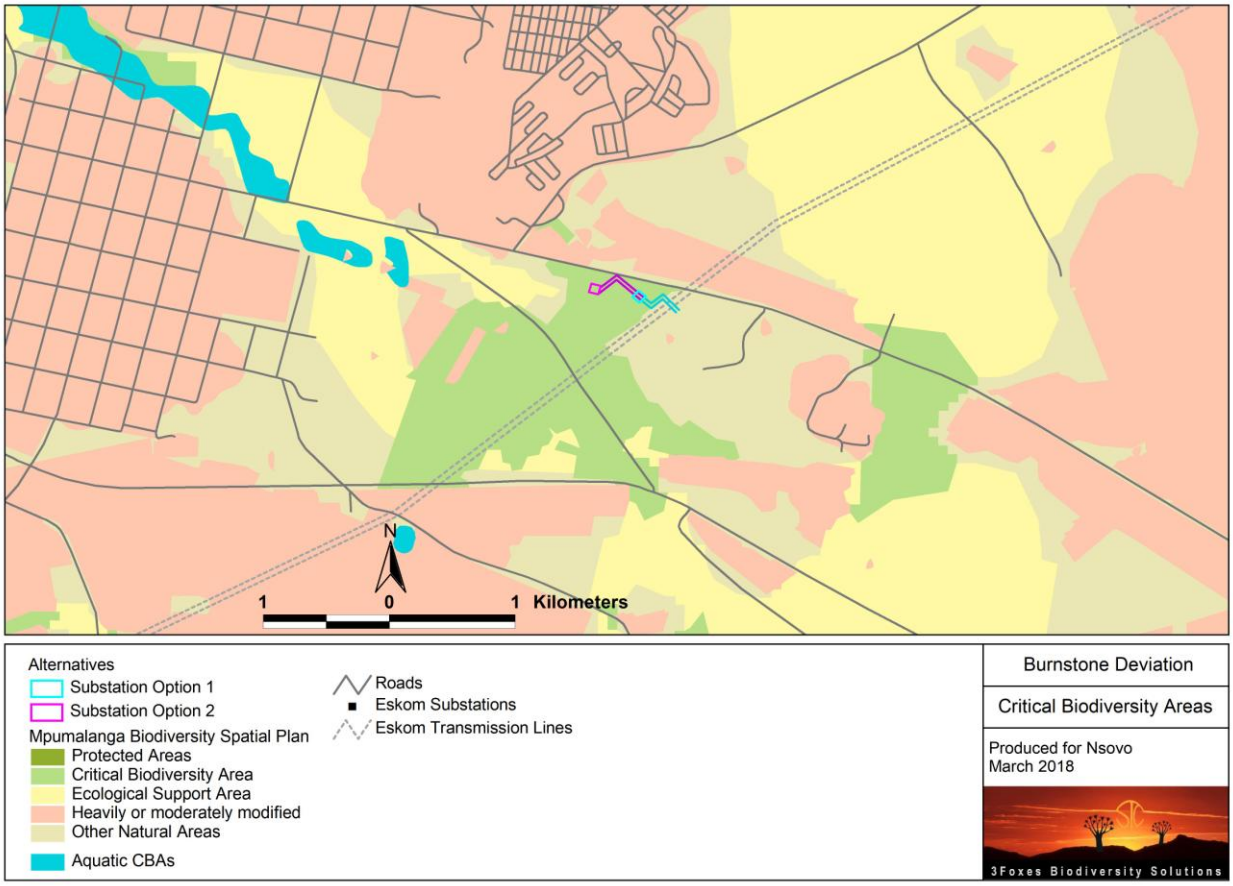

Figure 3. Extract of the 2014 Mpumalanga Biodiversity Spatial Plan showing the Critical Biodiversity Areas in the broad area around the study site.

3.3 Listed & Protected Plant Species

According to the SANBI SIBIS database, 220 species have have recorded from the vicinity of the study area. However, the area has not been well sampled in the past and the species list for the area is not considered complete or comprehensive. Only five species of conservation concern are known from the area (Table 1), although as mentioned above, the area has not been well-sampled and additional species of conservation concern are likely to be present within the wider area. However, the development footprint was well covered in the field assessment and no species of significant concervation concern were observed at the site.

Table 1. Listed plant species known from the vicinity of the study area based on records the SANBI POSA database. None of these species were observed present within the development footprint.

Family	Species	Status
AMARYLLIDACEAE	*Crinum bulbispermum*	Declining
ORCHIDACEAE	*Brachycorythis conica subsp. transvaalensis*	EN
ASPHODELACEAE	*Kniphofia typhoides*	NT
IRIDACEAE	*Gladiolus robertsoniae*	NT
ORCHIDACEAE	*Habenaria barbertoni*	NT

3.4 SITE DESCRIPTION

The site consists of open grassland with shrubs and small trees present only on larger rocky outcrops where there is some refuge from fire. There are some service roads, previous excavations and other types of disturbance present at the site, but overall it can be considered largely natural. The affected area is fairly flat with shallow soils and a series of low rocky areas distributed across the site. There is a small wetland about 230m from Substation Alternative 1, but this is well beyond the development footprint and would not be affected by the development.

The vegetation of the site is dominated by grasses with a well developed forb component and occasional trees and low shrubs concentrated on the more rocky ground. Grasses present include *Cymbopogon pospischilii*, *Digitaria eriantha*, *Setaria nigrirostris*, *Tristachya leucothrix*, *Andropogon schirensis*, *Melinis repens*, *Themeda triandra*, *Brachiaria serrata*, *Heteropogon contortus* and *Cynodon dactylon*. Low trees and shrubs present include *Searsia discolor*, *Searsia pyroides*, *Celtis africana*, *Rhamnus prinoides*, *Diospyros lycioides*, *Euclea crispa* subsp. *crispa*, *Lantana rugosa, Pollichia campestris*, *Teucrium trifidum, Osteospermum scariosum, Asparagus laricinus* and *Indigofera hedyantha*. Forbs and geophytes present include *Boophone disticha*, *Gladiolus crassifolius*, *Eucomis autumnalis*, *Kniphofia ensifolia*, *Aloe greatheadii* var. *davyana*, *Berkheya pinnatifida*, *Berkheya radula*, *Monsonia angustifolia*, *Hermannia linnaeoides*, *Gerbera viridifolia*, *Blepharis integrifolia*, *Dicoma anomala*, *Hibiscus microcarpus*, *Helichrysum aureonitens*, *Helichrysum callicomum*, *Helichrysum nudifolium* var. *nudifolium*, *Hilliardiella aristata*, *Acalypha caperonioides* var. *caperonioides*, *Rhynchosia totta* var. *totta*, *Striga bilabiata* subsp. *bilabiata*, *Solanum sisymbriifolium*.

Alien species abundance at the site is relatively low, but several species were observed to be present including *Datura stramonium*, *Tagetes minuta*, *Bidens pilosa*, *Conyza bonariensis*, *Cirsium vulgare*, *Bromus catharticus* and *Pennisteum clandestinum*.

Figure 4. Looking east over the footprint area of Substation Option 1 towards the Burnstone 88kV power line, showing the rocky ground which characterises this area. The vegetation consists of largely natural grassland with occasional woody shrubs and an adundance of forbs.

Figure 5. Looking south over the footprint area of Substation Option 2, showing the similarity of this area to the footprint of Substation Option 1. The vegetation is dominated by grasses and low forbs with occasional woody shrubs.

Figure 6. Looking east along the loop-in loop-out line alignment towards the Burnstone 88kV power line. This area consists of open grassland and is not considered high sensitive and has been impacted to some degree by livestock grazing as well as high fire frequency which has likely reduced the overall abundance of woody species from the area.

3.5 FAUNAL COMMUNITIES

Mammals

According to the MammalMap database (Annex 2), more than 70 terrestrial mammals are known from the broader study area, of which at least 40 are considered potentially present at the site. A large proportion of the mammals recorded from the wider area are conservation dependent larger ungulates (Zebra, Wildebeest etc.) or predators (Lion, Cheetah) and would not occur at the site. Of those species potentially present at the site it is likely that only a subset of these are actually present at the site as the area is not fenced and has open access to the local urban area and it is likely that dogs and hunting have eliminated most susceptible and disturbance-sensitive species from the area. This would include some of the listed species recorded in the area including the Oribi (EN), Serval (NT), Brown Hyeana (NT), Spotted Hyeana (NT). Listed species that may be present at the site include the African White-tailed Rat *Mystromys albicaudatus* (EN) and Southern African Hedgehog *Atelerix frontalis* (NT). The Highveld Golden Mole *Amblysomus septentrionalis* (NT) is also known from the broader area but has not been recorded as far west as Balfour and is not likely to be present at the site. The impact on the White-tailed Rat and Hedgehog is likely to be very low as these species are widely distributed and the site is not likely to be

an important refuge area for these two species. Given the low footprint of the development, overall long-term impacts on mammals are likely to be low and of a local nature only.

Reptiles

According to the ReptileMap database, 47 reptile species have been recorded from the degree square covering the site (Annex 3). This includes only one listed species the Striped Harlequin Snake *Homoroselaps dorsalis* (NT), which has a wide distribution across most of Gauteng, Mpumalanga, Kwa-Zulu Natal and the Free State as well as parts of Limpopo and Swaziland. The extent of the development is low and would not significantly this species which has a naturally fragmented population and is unlikely to be abundant at the site.

In general, impacts on reptiles are likely to be low as the extent of habitat loss generated by the development would be low and there are no habitats of high significance for reptiles within the site. There are however some resident reptiles at the site, especially among the rocky outcrops which provide shelter for geckos, skinks and snakes and there should be a preconstruction search and rescue for such species before the affected areas are cleared.

Amphibians

Twelve frog species are known from the half degree square which includes the study area and nineteen from the whole degree square. There are no important frog habitats within the development footprint and the area is considered to be of relatively low significance for frogs. There are however some wetlands near to the study area but these are several hundred meters from the development footprint and would not be directly affected by the development. Only one species of conservation concern is know from the area, the Giant Bullfrog *Pyxicephalus adspersus* (NT). While it is likely that this species is present in the area, the site itself is not likely to be important for this species and the development would not impact this species to a significant degree. Given the low overall extent of the development, impacts on amphibians are likely to be relatively low and no very high impacts are likely.

3.6 SITE SENSITIVITY ASSESSMENT

The sensitivity map for the study area is illustrated below in Figure 7. There is not a lot of variation in vegetation composition and hence sensitivity across the study area. Although the rocky areas are considered somewhat more sensitive than the surrounding grassland, this is not a large difference as the rocky outcrops are not well developed and do not have a well-developed associated flora or faunal community. Overall the affected area is considered moderate sensitivity and there is also little difference between the two

substation alternatives as both will impact a similar array of habitats. However Option 1 is considered preferable to Option 2 because it is closer to the existing power lines and so the extent of disturbance associated with the power line would be reduced. However, overall there is little difference in impact and both alternatives are considered acceptable.

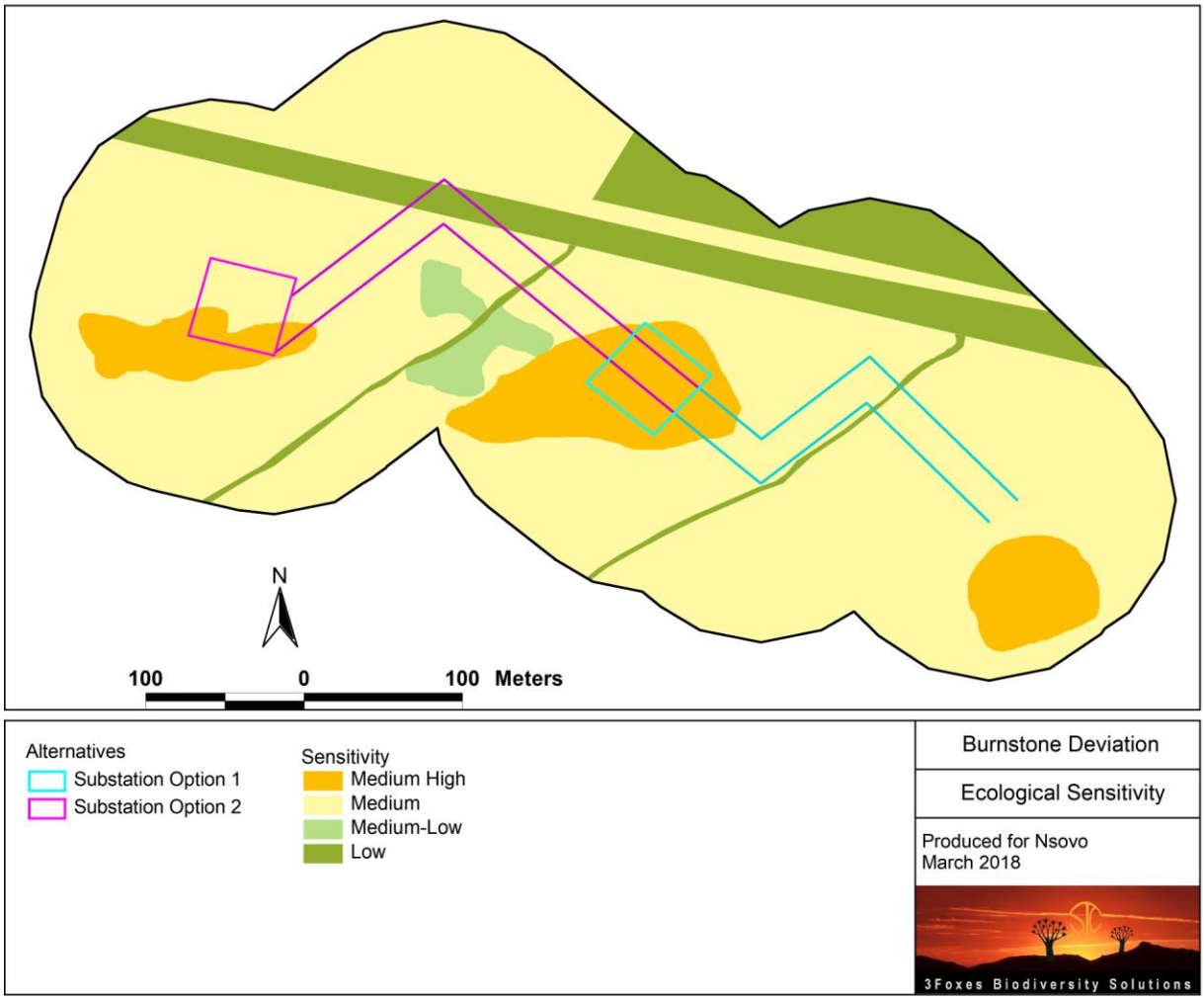

Figure 7. Ecological sensitivity map of the area affected by the Siyatemba Substation and Loop-in Loop-out lines and adjacent areas.

4 IDENTIFICATION & NATURE OF IMPACTS

4.1 CONSTRUCTION PHASE IMPACTS

The likely impacts on the terrestrial ecology of the site resulting from the development of the Siyathemba substation and associated powerlines are identified and discussed below with reference to the characteristics and features of the study area.

Impacts on vegetation and listed or protected plant species

Vegetation clearing for the substation, pylons, servitude roads and other infrastructure would result in loss of currently intact vegetation and on plant species of conservation concern. Although this impact can be reduced through a preconstruction walk-through, some impact on currently intact vegetation is inevitable and cannot be avoided. The overall extent of the development footprint is less than 1ha and as a result, this impact would be of local consequence only.

Direct Faunal Impacts.

Increased levels of noise, pollution, disturbance and human presence during construction of the substation and powerline will be detrimental to fauna. Sensitive and shy fauna are likely to move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. Slower types such as tortoises, snakes and amphibians would be most susceptible and the impact would be largely concentrated to the construction phase when vehicle activity is high. Disturbance would however be transient and restricted to the construction phase and as a result would be of short duration. Although habitat loss would be of long-term effect, the loss of less than 1ha of habitat would be of low consequence for fauna as there are not highly localised species known from the area.

4.2 OPERATIONAL PHASE IMPACTS

Faunal Impacts

During the operational phase of the development, impacts on fauna are likely to be very low and with standard mitigation and avoidance, no significant impacts on fauna during operation are anticipated. This impact is therefore not assessed for the Operational Phase.

Impact on Critical Biodiversity Areas

The footprint falls within areas that have been demarcated as CBAs and the loss of habitat within the CBAs would potentially result in a loss of biodiversity as well as a potential loss in ecosystem function within the CBA, with negative consequences for biodiversity maintenance in the long-term. Given the low extent of the development footprint this impact would be of local impact only.

4.3 CUMULATIVE IMPACTS

Cumulative impacts on broad-scale ecological processes

Habitat loss due to construction of the substation and power line would result in cumulative habitat loss and increased habitat fragmentation and potentially result in a loss of broad-scale landscape connectivity. Although the area has been significantly impacted by

cumulative habitat loss, the contribution of the current development is very low and is not considered to be a significant contributor to cumulative impact in the area.

5 ASSESSMENT METHODOLOGY

Assessment & Significance Criteria

Direct, indirect and cumulative impacts of the issues identified in this report are assessed in terms of the following criteria:

- The **nature** which includes a description of what causes the effect what will be affected and how it will be affected.
- The **extent** wherein it is indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 is assigned as appropriate (with 1 being low and 5 being high):
- The **duration** wherein it is indicated whether:
    - the lifetime of the impact will be of a very short duration (0- 1 years) - assigned a score of 1.
    - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2.
    - medium-term (5-15 years) - assigned a score of 3
    - long term (> 15 years) - assigned a score of 4; or
    - permanent - assigned a score of 5
- The **magnitude** quantified on a scale from 0-10 where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way 8 is high (processes are altered to the extent that they temporarily cease) and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** of occurrence, which shall describe the (likelihood of the impact actually occurring. Probability will be estimated on a scale of 1-5 where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but of low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).

The **significance** which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high;
and;
the status, which will be described as either positive, negative or neutral.
the degree to which the impact can be reversed.
the degree to which the impact may cause irreplaceable loss of resources.
the degree to which the impact can be mitigated.

The **significance** is calculated by combining the criteria in the following formula:

S = (E + D + M)P
Where
S = significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The significance weightings for each potential impact are as follows:

- **<30** points : **Low** (i.e. where this impact would not have a direct influence on the decision to develop in the area)
- **30-60** points : **Medium** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated)
- **>60** points: **High** (i.e. where the impact must have an influence on the decision process to develop in the area).

6 IMPACT ASSESSMENT

6.1 CONSTRUCTION PHASE IMPACTS

Impacts are assessed below for the construction and operational phases of the development.

Impacts on vegetation and protected plant species

Vegetation clearing for the substation and loop-in loop-out lines will impact vegetation and species of conservation concern.

Issue	Option	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
Vegetation Impacts During Construction	Option 1	No	Negative	1	4	2	4	28 = Low
		Yes	Negative	1	4	1	3	18 = Low
	Option 2	No	Negative	1	4	2	4	28 = Low
		Yes	Negative	1	4	2	3	22 = Low
Corrective Actions	• There should be a preconstruction walk-through of the substation footprint area and power line alignments to identify species of conservation concern that should be avoided or translocated. • Existing roads and access routes should be used wherever possible. • Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably							

	previously transformed areas if possible. • Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development. • Preconstruction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. • Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However caution should be exercised to avoid using material that might entangle fauna.

Faunal Impacts During Construction

Increased levels of noise, pollution, disturbance and human presence during construction will be detrimental to fauna resident or utilising the site. Sensitive and shy fauna would move away from the area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. Some mammals and reptiles would also be vulnerable to illegal collection or poaching.

Issue	Option	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
Fauna Impacts During Construction	Option 1	No	Negative	1	1	2	3	12 = Low
		Yes	Negative	1	1	1	2	6 = Low
	Option 2	No	Negative	1	1	2	3	12 = Low
		Yes	Negative	1	1	1	2	6 = Low
Corrective Actions	• Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person. • Existing roads and access routes should be used wherever possible. • During construction all vehicles should adhere to demarcated tracks or roads and the speed limit should not exceed 40km/h on larger roads and should be 20-30km/h on smaller access tracks. • All construction staff should undergo environmental induction before construction commences in order to raise awareness and reduce potential faunal impacts. • To avoid impacts on amphibians, all spills of hazardous material should be cleared in the appropriate manner according to the nature and identity of the spill and all contaminated soil removed from the site. • No fires should be allowed within the site as there is a risk of runaway veld fires. • If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the						

	appropriate manner as related to the nature of the spill.

6.2 OPERATIONAL PHASE IMPACTS

Impact on Critical Biodiversity Areas

The development fall within a CBA and the loss of habitat in CBAs may impact the ecological functioning of the CBAs and reduce biodiversity within the affected areas.

Issue	Option	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
Impacts on CBAs	Option 1	No	Negative	1	4	2	3	21 = Low
		Yes	Negative	1	4	2	2	14 = Low
	Option 2	No	Negative	1	4	2	3	21 = Low
		Yes	Negative	1	4	2	2	14 = Low
Corrective Actions	• The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas as far as possible. • The facility should be lit in an environmentally-friendly manner with low-uv emitting lights that do not attract insects at night. • The facility should not have electrified fencing on the outside fence within 30cm of the ground as this may negatively affect fauna.							

6.3 CUMULATIVE IMPACTS

Cumulative impacts on broad-scale ecological processes

Habitat loss due to construction of the substation and power line would contribute to cumulative impacts in the area. This would also increase habitat fragmentation and potentially result in a loss of broad-scale landscape connectivity.

Issue	Option	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
Impacts on CBAs	Corridor 1	No	Negative	1	4	2	2	14 = Low

		Yes	Negative	1	4	2	1	7 = Low
	Corridor 2	No	Negative	1	4	2	2	14 = Low
		Yes	Negative	1	4	2	1	7 = Low
Corrective Actions	• The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas.							

7 IDENTIFICATION OF PREFERRED ALTERNATIVES

The comparative assessment of the three power line corridor alternatives is provided below.

Key

PREFERRED	The alternative will result in a low impact / reduce the impact
FAVOURABLE	The impact will be relatively insignificant
NOT PREFERRED	The alternative will result in a high impact / increase the impact
NO PREFERENCE	The alternative will result in equal impacts

SIYATHEMBA SUBSTATION AND LOOP-IN LOOP-OUT LINES

Alternative	Preference	Reasons (incl. potential issues)
Option 1	PREFERRED	Substation Option 1 includes similar features in the footprint to Option 2 but the loop–in loop-out lines are shorter with the result that the overall footprint of the development would be lower.
Option 2	FAVOURABLE	Substation Option 2 is considered a favourable alternative but because the loop-in loop-out lines are longer than those for Option 1 it is considered less favourable. However, the difference between Option 1 and Option 2 is small and should Option 1 not be feasible for some reason, this is still considered to be a viable and acceptable substation alternative.

8 CONCLUSIONS & RECOMMENDATIONS

The two Siyathemba substation options are located less than 200m apart and as a result do not differ significantly in terms of the affected vegetation and fauna within the development footprint. No plant species of conservation concern were observed within the development

footprint and there were no faunal habitats of high value within the affected area. As the total footprint of the development is expected to be less than 1ha, the overall impact of the development on fauna and fauna is likely to be low. The site is however located within a CBA which is of potential concern. However, the low footprint of the development would not generate a significant impact on the CBA and it is not likely that the functioning of the CBA would be significantly affected. Although the area has been significantly affected by transformation, the contribution of the substation and associated power lines would be low and is not considered to contribute to cumulative impacts to a significant degree.

In terms of the preferred alternative, Substation Option 1 includes similar features in the footprint to Option 2 but the loop–in loop-out lines are shorter with the result that the overall footprint of the development would be lower and Option 1 is therefore identified as the preferred alternative. Substation Option 2 is however also considered to be an acceptable alternative but because the loop-in loop-out lines are longer than those for Option 1 it is considered less favourable. However, the difference between Option 1 and Option 2 is small and should Option 1 not be feasible for some reason, this is still considered to be a viable substation alternative with acceptable impacts.

The impacts of the Siyathemba Substation and associated loop-in loop-out lines on terrestrial ecosystems will be low and the development is deemed acceptable from an ecological perspective and as such should not be prevented from proceeding based on the ecological considerations as covered in this report.

9 LITERATURE CITED

Alexander, G. & Marais, J. 2007. *A Guide to the Reptiles of Southern Africa*. Struik Nature, Cape Town.

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

Branch W.R. 1998. *Field guide to snakes and other reptiles of southern Africa*. Struik, Cape Town.

Brownlie, S. 2005. Guideline for Involving Biodiversity Specialists in EIA Processes: Edition 1. CSIR Report No ENV-S-C 2005 053 C. Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town. 63 pp.

De Villiers CC, Driver A, Clark B, Euston-Brown DIW, Day EG, Job N, Helme NA, Holmes PM, Brownlie S and Rebelo AB (2005) *Fynbos Forum Ecosystem Guidelines for Environmental Assessment in the Western Cape.* Fynbos Forum and Botanical Society of South Africa, Kirstenbosch.

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

Minter LR, Burger M, Harrison JA, Braack HH, Bishop PJ & Kloepfer D (eds). 2004. Atlas and Red Data book of the frogs of South Africa, Lesotho and Swaziland. SI/MAB Series no. 9. Smithsonian Institution, Washington, D.C

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

Passmore, N.I. & Carruthers, V.C. 1995. *South African Frogs: A complete guide*. Witwatersrand University Press, Johannesburg. 322 pp.

Skinner, J.D. & Chimimba, C.T. 2005. The mammals of the Southern African Subregion. Cambridge University Press, Cambridge.

10 ANNEX 1. LIST OF PLANT SPECIES

List of plant species of conservation concern which are known to occur in the broad vicinity of the Siyathemba study area, according to the SANBI POSA database.

Family	Naturalised	Species	Threat status
ACANTHACEAE		*Justicia flava (Vahl) Vahl*	LC
AMARANTHACEAE	*	*Achyranthes aspera L. var. aspera*	Not Evaluated
AMARYLLIDACEAE		*Boophone disticha (L.f.) Herb.*	Declining
AMARYLLIDACEAE		*Crinum bulbispermum (Burm.f.) Milne-Redh. & Schweick.*	Declining
AMARYLLIDACEAE		*Haemanthus montanus Baker*	LC
ANACARDIACEAE		*Searsia discolor (E.Mey. ex Sond.) Moffett*	LC
ANACARDIACEAE		*Searsia magalismontana (Sond.) Moffett subsp. magalismontana*	LC
ANACARDIACEAE		*Searsia pyroides (Burch.) Moffett var. gracilis (Engl.) Moffett*	LC
ANACARDIACEAE		*Searsia pyroides (Burch.) Moffett var. pyroides*	LC
ANACARDIACEAE		*Searsia rigida (Mill.) F.A.Barkley var. margaretae (Burtt Davy ex Moffett) Moffett*	LC
ANACARDIACEAE		*Searsia rigida (Mill.) F.A.Barkley var. rigida*	LC
APIACEAE		*Afrosciadium magalismontanum (Sond.) P.J.D.Winter*	LC
APIACEAE		*Berula thunbergii (DC.) H.Wolff*	LC
APIACEAE		*Heteromorpha arborescens (Spreng.) Cham. & Schltdl. var. abyssinica (Hochst. ex A.Rich.) H.Wolff*	LC
APOCYNACEAE		*Asclepias albens (E.Mey.) Schltr.*	LC
APOCYNACEAE		*Asclepias eminens (Harv.) Schltr.*	LC
APOCYNACEAE		*Asclepias gibba (E.Mey.) Schltr. var. gibba*	LC
APOCYNACEAE		*Asclepias gibba (E.Mey.) Schltr. var. media N.E.Br.*	LC
APOCYNACEAE		*Asclepias meyeriana (Schltr.) Schltr.*	LC
APOCYNACEAE		*Asclepias stellifera Schltr.*	LC
APOCYNACEAE		*Aspidoglossum biflorum E.Mey.*	LC
APOCYNACEAE		*Aspidoglossum interruptum (E.Mey.) Bullock*	LC
APOCYNACEAE		*Aspidoglossum lamellatum (Schltr.) Kupicha*	LC
APOCYNACEAE		*Aspidoglossum ovalifolium (Schltr.) Kupicha*	LC
APOCYNACEAE		*Brachystelma foetidum Schltr.*	LC
APOCYNACEAE		*Gomphocarpus fruticosus (L.) Aiton f. subsp. fruticosus*	LC
APOCYNACEAE		*Gomphocarpus physocarpus E.Mey.*	LC
APOCYNACEAE		*Gomphocarpus rivularis Schltr.*	LC
APOCYNACEAE		*Orbea cooperi (N.E.Br.) L.C.Leach*	LC
APOCYNACEAE		*Schizoglossum periglossoides Schltr.*	LC
APOCYNACEAE		*Woodia mucronata (Thunb.) N.E.Br.*	LC
APOCYNACEAE		*Xysmalobium undulatum (L.) Aiton f. var. undulatum*	LC
APONOGETONACEAE		*Aponogeton junceus Lehm.*	LC
APONOGETONACEAE		*Aponogeton rehmannii Oliv.*	LC
ARACEAE		*Zantedeschia albomaculata (Hook.) Baill. subsp. albomaculata*	LC
ASPARAGACEAE		*Asparagus angusticladus (Jessop) J.-P.Lebrun & Stork*	LC
ASPARAGACEAE		*Asparagus devenishii (Oberm.) Fellingham & N.L.Mey.*	LC
ASPARAGACEAE		*Asparagus setaceus (Kunth) Jessop*	LC
ASPHODELACEAE		*Bulbine abyssinica A.Rich.*	LC
ASPHODELACEAE		*Bulbine frutescens (L.) Willd.*	LC
ASPHODELACEAE		*Bulbine narcissifolia Salm-Dyck*	LC
ASPHODELACEAE		*Kniphofia ensifolia Baker*	LC
ASPHODELACEAE		*Kniphofia typhoides Codd*	NT
ASPHODELACEAE		*Trachyandra erythrorrhiza (Conrath) Oberm.*	NT
ASTERACEAE		*Artemisia afra Jacq. ex Willd. var. afra*	LC
ASTERACEAE		*Berkheya pinnatifida (Thunb.) Thell. subsp. ingrata (Bolus) Roessler*	LC
ASTERACEAE		*Berkheya radula (Harv.) De Wild.*	LC
ASTERACEAE		*Berkheya seminivea Harv. & Sond.*	LC
ASTERACEAE		*Chrysocoma ciliata L.*	LC
ASTERACEAE		*Cineraria aspera Thunb.*	LC

ASTERACEAE		*Denekia capensis Thunb.*	LC
ASTERACEAE		*Euryops transvaalensis Klatt subsp. transvaalensis*	LC
ASTERACEAE		*Felicia filifolia (Vent.) Burtt Davy subsp. filifolia*	LC
ASTERACEAE		*Geigeria aspera Harv. var. aspera*	LC
ASTERACEAE		*Geigeria burkei Harv. subsp. burkei var. intermedia (S.Moore) Merxm.*	LC
ASTERACEAE		*Gerbera ambigua (Cass.) Sch.Bip.*	LC
ASTERACEAE		*Gerbera viridifolia (DC.) Sch.Bip.*	LC
ASTERACEAE		*Helichrysum aureonitens Sch.Bip.*	LC
ASTERACEAE		*Helichrysum caespititium (DC.) Harv.*	LC
ASTERACEAE		*Helichrysum callicomum Harv.*	LC
ASTERACEAE		*Helichrysum chionosphaerum DC.*	LC
ASTERACEAE		*Helichrysum nudifolium (L.) Less. var. nudifolium*	LC
ASTERACEAE		*Hilliardiella aristata (DC.) H.Rob.*	LC
ASTERACEAE		*Lasiospermum pedunculare Lag.*	LC
ASTERACEAE		*Schistostephium crataegifolium (DC.) Fenzl ex Harv.*	LC
ASTERACEAE		*Senecio discodregeanus Hilliard & B.L.Burtt*	LC
ASTERACEAE		*Senecio erubescens Aiton var. erubescens*	LC
ASTERACEAE		*Senecio hieracioides DC.*	LC
ASTERACEAE		*Senecio inaequidens DC.*	LC
ASTERACEAE	*	*Tragopogon dubius Scop.*	Not Evaluated
ASTERACEAE	*	*Xanthium strumarium L.*	Not Evaluated
AYTONIACEAE		*Plagiochasma rupestre (J.R.& G.Forst.) Steph. var. rupestre*	
AZOLLACEAE	*	*Azolla filiculoides Lam.*	Not Evaluated
BRYACEAE		*Brachymenium acuminatum Harv.*	
BRYACEAE		*Bryum argenteum Hedw.*	
CAMPANULACEAE		*Wahlenbergia denticulata (Burch.) A.DC. var. denticulata*	LC
COMMELINACEAE		*Commelina africana L. var. africana*	LC
CONVOLVULACEAE		*Convolvulus ocellatus Hook.f. var. ocellatus*	LC
CONVOLVULACEAE		*Convolvulus sagittatus Thunb.*	LC
CONVOLVULACEAE	*	*Cuscuta campestris Yunck.*	Not Evaluated
CONVOLVULACEAE		*Falkia oblonga Bernh. ex C.Krauss*	LC
CONVOLVULACEAE		*Ipomoea crassipes Hook. var. crassipes*	LC
CONVOLVULACEAE		*Ipomoea oblongata E.Mey. ex Choisy*	LC
CONVOLVULACEAE		*Ipomoea oenotheroides (L.f.) Raf. ex Hallier f.*	LC
CONVOLVULACEAE		*Ipomoea ommanneyi Rendle*	LC
CRASSULACEAE		*Crassula setulosa Harv. var. setulosa forma setulosa*	Not Evaluated
CYPERACEAE		*Bulbostylis contexta (Nees) M.Bodard*	LC
CYPERACEAE		*Cyperus capensis (Steud.) Endl.*	LC
CYPERACEAE		*Cyperus congestus Vahl*	LC
CYPERACEAE		*Cyperus esculentus L. var. esculentus*	LC
CYPERACEAE		*Cyperus longus L. var. tenuiflorus (Rottb.) Boeck.*	LC
CYPERACEAE		*Cyperus marginatus Thunb.*	LC
CYPERACEAE		*Fuirena pubescens (Poir.) Kunth var. pubescens*	LC
CYPERACEAE		*Kyllinga erecta Schumach. var. erecta*	LC
DIPSACACEAE		*Cephalaria oblongifolia (Kuntze) Szab≤*	LC
EBENACEAE		*Diospyros lycioides Desf. subsp. guerkei (Kuntze) De Winter*	LC
EBENACEAE		*Euclea crispa (Thunb.) G"rke subsp. crispa*	LC
EUPHORBIACEAE		*Acalypha caperonioides Baill. var. caperonioides*	DDT
EUPHORBIACEAE		*Clutia monticola S.Moore var. monticola*	LC
EUPHORBIACEAE		*Clutia natalensis Bernh.*	LC
EUPHORBIACEAE		*Clutia pulchella L. var. pulchella*	LC
EUPHORBIACEAE		*Euphorbia inaequilatera Sond. var. inaequilatera*	LC
EUPHORBIACEAE		*Euphorbia striata Thunb. var. striata*	LC
FABACEAE		*Argyrolobium molle Eckl. & Zeyh.*	LC
FABACEAE		*Argyrolobium tuberosum Eckl. & Zeyh.*	LC
FABACEAE		*Dolichos linearis E.Mey.*	LC
FABACEAE		*Elephantorrhiza elephantina (Burch.) Skeels*	LC
FABACEAE		*Eriosema pauciflorum Klotzsch x E. salignum E.Mey.*	Not Evaluated
FABACEAE		*Eriosema salignum E.Mey.*	LC

FABACEAE		*Indigofera confusa Prain & Baker f.*	LC
FABACEAE		*Indigofera hedyantha Eckl. & Zeyh.*	LC
FABACEAE		*Melolobium wilmsii Harms*	LC
FABACEAE		*Pearsonia sessilifolia (Harv.) Dummer subsp. filifolia (Bolus) Polhill*	LC
FABACEAE		*Rhynchosia calvescens Meikle*	LC
FABACEAE		*Rhynchosia totta (Thunb.) DC. var. totta*	LC
GENTIANACEAE		*Sebaea erosa Schinz*	LC
GENTIANACEAE		*Sebaea leiostyla Gilg*	LC
GERANIACEAE		*Pelargonium alchemilloides (L.) L'HΘr.*	LC
GERANIACEAE		*Pelargonium luridum (Andrews) Sweet*	LC
GERANIACEAE		*Pelargonium minimum (Cav.) Willd.*	LC
GERANIACEAE		*Pelargonium nelsonii Burtt Davy*	LC
HYACINTHACEAE		*Ornithogalum flexuosum (Thunb.) U.& D.Mⁿll.-Doblies*	LC
HYPOXIDACEAE		*Hypoxis argentea Harv. ex Baker var. argentea*	LC
ICACINACEAE		*Cassinopsis ilicifolia (Hochst.) Kuntze*	LC
IRIDACEAE		*Babiana bainesii Baker*	LC
IRIDACEAE		*Dierama mossii (N.E.Br.) Hilliard*	LC
IRIDACEAE		*Freesia grandiflora (Baker) Klatt subsp. grandiflora*	LC
IRIDACEAE		*Gladiolus crassifolius Baker*	LC
IRIDACEAE		*Gladiolus permeabilis D.Delaroche subsp. edulis (Burch. ex Ker Gawl.) Oberm.*	LC
IRIDACEAE		*Gladiolus robertsoniae F.Bolus*	NT
IRIDACEAE		*Gladiolus sericeovillosus Hook.f. subsp. calvatus (Baker) Goldblatt*	LC
IRIDACEAE		*Moraea pallida (Baker) Goldblatt*	LC
JUNCACEAE		*Juncus exsertus Buchenau*	LC
LAMIACEAE		*Acrotome inflata Benth.*	LC
LAMIACEAE		*Ajuga ophrydis Burch. ex Benth.*	LC
LAMIACEAE		*Teucrium trifidum Retz.*	LC
LYTHRACEAE		*Nesaea sagittifolia (Sond.) Koehne var. sagittifolia*	LC
MALVACEAE		*Hermannia coccocarpa (Eckl. & Zeyh.) Kuntze*	LC
MALVACEAE		*Hermannia comosa Burch. ex DC.*	LC
MALVACEAE		*Hermannia cristata Bolus*	LC
MALVACEAE		*Hermannia floribunda Harv.*	LC
MALVACEAE		*Hermannia grandistipula (Buchinger ex Hochst.) K.Schum.*	LC
MALVACEAE		*Hermannia stellulata (Harv.) K.Schum.*	LC
MALVACEAE		*Hibiscus aethiopicus L. var. ovatus Harv.*	LC
MALVACEAE		*Hibiscus microcarpus Garcke*	LC
MYROTHAMNACEAE		*Myrothamnus flabellifolius Welw.*	DDT
ONAGRACEAE	*	*Oenothera tetraptera Cav.*	Not Evaluated
ORCHIDACEAE		*Bonatea antennifera Rolfe*	LC
ORCHIDACEAE		*Brachycorythis conica (Summerh.) Summerh. subsp. transvaalensis Summerh.*	EN
ORCHIDACEAE		*Corycium nigrescens Sond.*	LC
ORCHIDACEAE		*Eulophia hians Spreng. var. nutans (Sond.) S.Thomas*	LC
ORCHIDACEAE		*Habenaria barbertoni Kraenzl. & Schltr.*	NT
ORCHIDACEAE		*Habenaria epipactidea Rchb.f.*	LC
OROBANCHACEAE		*Alectra orobanchoides Benth.*	LC
OROBANCHACEAE		*Alectra pumila Benth.*	LC
OROBANCHACEAE		*Sopubia cana Harv. var. cana*	LC
OROBANCHACEAE		*Striga asiatica (L.) Kuntze*	LC
OROBANCHACEAE		*Striga bilabiata (Thunb.) Kuntze subsp. bilabiata*	LC
PAPAVERACEAE		*Papaver aculeatum Thunb.*	LC
PHYLLANTHACEAE		*Phyllanthus glaucophyllus Sond.*	LC
POACEAE		*Alloteropsis semialata (R.Br.) Hitchc. subsp. semialata*	LC
POACEAE		*Andropogon schirensis Hochst. ex A.Rich.*	LC
POACEAE		*Aristida congesta Roem. & Schult. subsp. congesta*	LC
POACEAE		*Aristida diffusa Trin. subsp. burkei (Stapf) Melderis*	LC
POACEAE		*Aristida junciformis Trin. & Rupr. subsp. junciformis*	LC
POACEAE		*Aristida scabrivalvis Hack. subsp. scabrivalvis*	LC
POACEAE		*Catalepis gracilis Stapf & Stent*	LC
POACEAE		*Chloris virgata Sw.*	LC

POACEAE	*	*Cymbopogon pospischilii (K.Schum.) C.E.Hubb.*	Not Evaluated
POACEAE		*Cymbopogon prolixus (Stapf) E.Phillips*	LC
POACEAE		*Digitaria eriantha Steud.*	LC
POACEAE	*	*Digitaria sanguinalis (L.) Scop.*	Not Evaluated
POACEAE		*Digitaria ternata (A.Rich.) Stapf*	LC
POACEAE		*Diheteropogon amplectens (Nees) Clayton var. amplectens*	LC
POACEAE		*Eragrostis curvula (Schrad.) Nees*	LC
POACEAE		*Eragrostis micrantha Hack.*	LC
POACEAE		*Eragrostis planiculmis Nees*	LC
POACEAE		*Eragrostis trichophora Coss. & Durieu*	LC
POACEAE		*Harpochloa falx (L.f.) Kuntze*	LC
POACEAE		*Hyparrhenia dregeana (Nees) Stapf ex Stent*	LC
POACEAE		*Hyparrhenia hirta (L.) Stapf*	LC
POACEAE		*Panicum schinzii Hack.*	LC
POACEAE		*Panicum stapfianum Fourc.*	LC
POACEAE		*Panicum volutans J.G.Anderson*	LC
POACEAE	*	*Paspalum notatum Fl^{n}ggΘ*	Not Evaluated
POACEAE		*Setaria pumila (Poir.) Roem. & Schult.*	LC
POACEAE		*Setaria sphacelata (Schumach.) Stapf & C.E.Hubb. ex M.B.Moss var. torta (Stapf) Clayton*	LC
POACEAE		*Sporobolus natalensis (Steud.) T.Durand & Schinz*	LC
POACEAE		*Themeda triandra Forssk.*	LC
POACEAE		*Trachypogon spicatus (L.f.) Kuntze*	LC
POACEAE		*Tragus racemosus (L.) All.*	LC
POACEAE		*Tristachya rehmannii Hack.*	LC
POLYGALACEAE		*Polygala albida Schinz subsp. albida*	LC
POLYGONACEAE		*Persicaria attenuata (R.Br.) Sojβk subsp. africana K.L.Wilson*	LC
POLYGONACEAE		*Polygonum plebeium R.Br.*	LC
POTAMOGETONACEAE		*Potamogeton nodosus Poir.*	LC
POTTIACEAE		*Bryoerythrophyllum campylocarpum (M^{n}ll.Hal.) H.A.Crum*	
PROTEACEAE		*Protea welwitschii Engl.*	LC
RANUNCULACEAE	*	*Ranunculus multifidus Forssk.*	
RESEDACEAE		*Oligomeris dregeana (M^{n}ll.Arg.) M^{n}ll.Arg.*	LC
RHAMNACEAE		*Helinus integrifolius (Lam.) Kuntze*	LC
RUBIACEAE		*Kohautia amatymbica Eckl. & Zeyh.*	LC
RUBIACEAE		*Pachystigma thamnus Robyns*	LC
RUBIACEAE		*Pentanisia angustifolia (Hochst.) Hochst.*	LC
SALICACEAE		*Salix mucronata Thunb. subsp. woodii (Seemen) Immelman*	LC
SCROPHULARIACEAE		*Chaenostoma leve (Hiern) Kornhall*	LC
SCROPHULARIACEAE		*Hebenstretia angolensis Rolfe*	LC
SCROPHULARIACEAE		*Jamesbrittenia aurantiaca (Burch.) Hilliard*	LC
SCROPHULARIACEAE		*Nemesia umbonata (Hiern) Hilliard & B.L.Burtt*	LC
SCROPHULARIACEAE		*Veronica anagallis-aquatica L.*	LC
SINOPTERIDACEAE		*Cheilanthes hirta Sw. var. brevipilosa W.& N.Jacobsen forma laxa (Kunze) W.& N.Jacobsen*	
SINOPTERIDACEAE		*Cheilanthes hirta Sw. var. hirta*	LC
SINOPTERIDACEAE		*Pellaea calomelanos (Sw.) Link var. calomelanos*	LC
SOLANACEAE	*	*Datura ferox L.*	Not Evaluated
SOLANACEAE	*	*Solanum pseudocapsicum L.*	Not Evaluated
SOLANACEAE		*Solanum retroflexum Dunal*	LC
SOLANACEAE	*	*Solanum sisymbriifolium Lam.*	Not Evaluated
SOLANACEAE		*Withania somnifera (L.) Dunal*	LC
THYMELAEACEAE		*Gnidia gymnostachya (C.A.Mey.) Gilg*	LC
VERBENACEAE		*Lantana rugosa Thunb.*	LC
VERBENACEAE		*Priva meyeri Jaub. & Spach var. meyeri*	LC

11 ANNEX 2. LIST OF MAMMALS

List of mammals which have been recorded in the broad area around the Siyathemba site based on the ADU MammalMap Database.

Family	Genus	Species	Subspecies	Common name	Red list category	No. records	Likely Presence
Muridae	*Gerbilliscus*	*leucogaster*		Bushveld Gerbil	Data Deficient	2	1
Mustelidae	*Poecilogale*	*albinucha*		African Striped Weasel	Data deficient	1	1
Soricidae	*Crocidura*	*mariquensis*		Swamp Musk Shrew	Data Deficient	113	
Soricidae	*Myosorex*	*varius*		Forest Shrew	Data Deficient	2	1
Soricidae	*Suncus*	*infinitesimus*		Least Dwarf Shrew	Data Deficient	2	1
Bovidae	*Ourebia*	*ourebi*		Oribi	Endangered	8	
Nesomyidae	*Mystromys*	*albicaudatus*		African White-tailed Rat	Endangered	1	1
Bathyergidae	*Cryptomys*	*hottentotus*		Southern African Mole-rat	Least Concern	5	1
Bovidae	*Aepyceros*	*melampus*		Impala	Least Concern	1	
Bovidae	*Alcelaphus*	*buselaphus*		Hartebeest	Least Concern	191	
Bovidae	*Antidorcas*	*marsupialis*		Springbok	Least Concern	117	
Bovidae	*Connochaetes*	*gnou*		Black Wildebeest	Least Concern	286	
Bovidae	*Connochaetes*	*taurinus*	*taurinus*	Blue Wildebeest	Least Concern	1	
Bovidae	*Damaliscus*	*pygargus*	*phillipsi*	Blesbok	Least Concern	318	
Bovidae	*Kobus*	*ellipsiprymnus*		Waterbuck	Least Concern	1	
Bovidae	*Oreotragus*	*oreotragus*		Klipspringer	Least Concern	2	
Bovidae	*Pelea*	*capreolus*		Vaal Rhebok	Least Concern	6	
Bovidae	*Raphicerus*	*campestris*		Steenbok	Least Concern	61	1
Bovidae	*Redunca*	*arundinum*		Southern Reedbuck	Least Concern	38	
Bovidae	*Redunca*	*fulvorufula*		Mountain Reedbuck	Least Concern	8	
Bovidae	*Sylvicapra*	*grimmia*		Bush Duiker	Least Concern	15	1
Bovidae	*Taurotragus*	*oryx*		Common Eland	Least Concern	175	
Bovidae	*Tragelaphus*	*angasii*		Nyala	Least Concern	1	
Bovidae	*Tragelaphus*	*strepsiceros*		Greater Kudu	Least Concern	28	
Canidae	*Canis*	*mesomelas*		Black-backed Jackal	Least Concern	98	1
Canidae	*Vulpes*	*chama*		Cape Fox	Least Concern	2	1
Cercopithecidae	*Papio*	*ursinus*		Chacma Baboon	Least Concern	1	1
Equidae	*Equus*	*quagga*		Plains Zebra	Least Concern	335	
Felidae	*Caracal*	*caracal*		Caracal	Least Concern	4	1
Felidae	*Felis*	*nigripes*		Black-footed Cat	Least Concern	1	1
Felidae	*Felis*	*silvestris*		Wildcat	Least Concern	4	1
Felidae	*Panthera*	*pardus*		Leopard	Least Concern	3	
Galagidae	*Galago*	*senegalensis*		Senegal Bushbaby	Least Concern	1	
Giraffidae	*Giraffa*	*camelopardalis*	*camelopardalis*	Nubian Giraffe	Least Concern	1	
Herpestidae	*Atilax*	*paludinosus*		Marsh Mongoose	Least Concern	12	1
Herpestidae	*Cynictis*	*penicillata*		Yellow Mongoose	Least Concern	24	1
Herpestidae	*Herpestes*	*ichneumon*		Egyptian Mongoose	Least Concern	1	1

Herpestidae	*Herpestes*	*pulverulentus*		Cape Gray Mongoose	Least Concern	1	1
Herpestidae	*Herpestes*	*sanguineus*		Slender Mongoose	Least Concern	17	1
Herpestidae	*Suricata*	*suricatta*		Meerkat	Least Concern	13	1
Hyaenidae	*Proteles*	*cristata*		Aardwolf	Least Concern	2	1
Hystricidae	*Hystrix*	*africaeaustralis*		Cape Porcupine	Least Concern	45	1
Leporidae	*Lepus*	*capensis*		Cape Hare	Least Concern	3	1
Leporidae	*Lepus*	*saxatilis*		Scrub Hare	Least Concern	24	1
Leporidae	*Pronolagus*	*randensis*		Jameson's Red Rock Hare	Least Concern	6	
Leporidae	*Pronolagus*	*rupestris*		Smith's Red Rock Hare	Least Concern	2	
Macroscelididae	*Elephantulus*	*myurus*		Eastern Rock Elephant Shrew	Least Concern	36	1
Muridae	*Aethomys*	*ineptus*		Tete Veld Aethomys	Least Concern	3	
Muridae	*Aethomys*	*namaquensis*		Namaqua Rock Mouse	Least Concern	397	1
Muridae	*Gerbilliscus*	*brantsii*		Highveld Gerbil	Least Concern	5	1
Muridae	*Mastomys*	*coucha*		Southern African Mastomys	Least Concern	32	1
Muridae	*Mastomys*	*natalensis*		Natal Mastomys	Least Concern	3	1
Muridae	*Mus*	*minutoides*		Southern African Pygmy Mouse	Least Concern	6	1
Muridae	*Otomys*	*angoniensis*		Angoni Vlei Rat	Least Concern	2	1
Muridae	*Otomys*	*auratus*		Southern African Vlei Rat	Least Concern	47	1
Muridae	*Rhabdomys*	*pumilio*		Xeric Four-striped Grass Rat	Least Concern	2279	1
Mustelidae	*Aonyx*	*capensis*		African Clawless Otter	Least Concern	27	
Mustelidae	*Ictonyx*	*striatus*		Striped Polecat	Least Concern	2	1
Nesomyidae	*Dendromus*	*mystacalis*		Chestnut African Climbing Mouse	Least Concern	1	1
Nesomyidae	*Steatomys*	*pratensis*		Common African Fat Mouse	Least Concern	1	1
Orycteropodidae	*Orycteropus*	*afer*		Aardvark	Least Concern	1	1
Sciuridae	*Xerus*	*inauris*		South African Ground Squirrel	Least Concern	2	1
Suidae	*Phacochoerus*	*africanus*		Common Warthog	Least Concern	1	
Suidae	*Potamochoerus*	*larvatus*	*koiropotamus*	Bush-pig	Least Concern	1	1
Thryonomyidae	*Thryonomys*	*swinderianus*		Greater Cane Rat	Least Concern	3	1
Viverridae	*Civettictis*	*civetta*		African Civet	Least Concern	9	
Viverridae	*Genetta*	*genetta*		Common Genet	Least Concern	4	1
Viverridae	*Genetta*	*tigrina*		Cape Genet	Least Concern	3	1
Mustelidae	*Hydrictis*	*maculicollis*		Spotted-necked Otter	Least Concern (IUCN 2008)	3	
Procaviidae	*Procavia*	*capensis*		Cape Rock Hyrax	Least Concern ver 3.1 (2015)	4	
Chrysochloridae	*Amblysomus*	*septentrionalis*		Highveld Golden Mole	Near Threatened	2	
Erinaceidae	*Atelerix*	*frontalis*		Southern African Hedgehog	Near Threatened	7	1
Felidae	*Leptailurus*	*serval*		Serval	Near Threatened	21	1
Hyaenidae	*Crocuta*	*crocuta*		Spotted Hyaena	Near Threatened	1	
Hyaenidae	*Hyaena*	*brunnea*		Brown Hyena	Near Threatened	26	
Felidae	*Acinonyx*	*jubatus*		Cheetah	Vulnerable	1	
Felidae	*Panthera*	*leo*		Lion	Vulnerable	1	

12 ANNEX 3. LIST OF REPTILES

List of reptiles which are likely to occur in the vicinity of the Siyathemba study area. Conservation status is from Bates et al. (2014).

Family	Genus	Species	Subspecies	Common name	Red list category
Agamidae	*Agama*	*aculeata*	*distanti*	Distant's Ground Agama	Least Concern
Agamidae	*Agama*	*atra*		Southern Rock Agama	Least Concern
Chamaeleonidae	*Bradypodion*	*ventrale*		Eastern Cape Dwarf Chameleon	Least Concern
Chamaeleonidae	*Chamaeleo*	*dilepis*	*dilepis*	Common Flap-neck Chameleon	Least Concern
Colubridae	*Crotaphopeltis*	*hotamboeia*		Red-lipped Snake	Least Concern
Colubridae	*Dasypeltis*	*scabra*		Rhombic Egg-eater	Least Concern
Cordylidae	*Cordylus*	*vittifer*		Common Girdled Lizard	Least Concern
Cordylidae	*Pseudocordylus*	*melanotus*	*melanotus*	Common Crag Lizard	Least Concern
Elapidae	*Elapsoidea*	*sundevallii*	*media*	Highveld Garter Snake	Not Assessed
Elapidae	*Hemachatus*	*haemachatus*		Rinkhals	Least Concern
Gekkonidae	*Hemidactylus*	*mabouia*		Common Tropical House Gecko	Least Concern
Gekkonidae	*Lygodactylus*	*capensis*	*capensis*	Common Dwarf Gecko	Least Concern
Gekkonidae	*Pachydactylus*	*affinis*		Transvaal Gecko	Least Concern
Gekkonidae	*Pachydactylus*	*capensis*		Cape Gecko	Least Concern
Gerrhosauridae	*Gerrhosaurus*	*flavigularis*		Yellow-throated Plated Lizard	Least Concern
Lacertidae	*Nucras*	*lalandii*		Delalande's Sandveld Lizard	Least Concern
Lacertidae	*Pedioplanis*	*burchelli*		Burchell's Sand Lizard	Least Concern
Lamprophiidae	*Aparallactus*	*capensis*		Black-headed Centipede-eater	Least Concern
Lamprophiidae	*Atractaspis*	*bibronii*		Bibron's Stiletto Snake	Least Concern
Lamprophiidae	*Boaedon*	*capensis*		Brown House Snake	Least Concern
Lamprophiidae	*Duberria*	*lutrix*	*lutrix*	South African Slug-eater	Least Concern
Lamprophiidae	*Homoroselaps*	*dorsalis*		Striped Harlequin Snake	Near Threatened
Lamprophiidae	*Homoroselaps*	*lacteus*		Spotted Harlequin Snake	Least Concern
Lamprophiidae	*Lamprophis*	*aurora*		Aurora House Snake	Least Concern
Lamprophiidae	*Lycodonomorphus*	*inornatus*		Olive House Snake	Least Concern
Lamprophiidae	*Lycodonomorphus*	*rufulus*		Brown Water Snake	Least Concern
Lamprophiidae	*Lycophidion*	*capense*	*capense*	Cape Wolf Snake	Least Concern
Lamprophiidae	*Prosymna*	*sundevallii*		Sundevall's Shovel-snout	Least Concern
Lamprophiidae	*Psammophis*	*brevirostris*		Short-snouted Grass Snake	Least Concern
Lamprophiidae	*Psammophis*	*crucifer*		Cross-marked Grass Snake	Least Concern
Lamprophiidae	*Psammophis*	*subtaeniatus*		Western Yellow-bellied Sand Snake	Least Concern
Lamprophiidae	*Psammophylax*	*rhombeatus*	*rhombeatus*	Spotted Grass Snake	Least Concern
Lamprophiidae	*Pseudaspis*	*cana*		Mole Snake	Least Concern
Leptotyphlopidae	*Leptotyphlops*	*scutifrons*	*conjunctus*	Eastern Thread Snake	Not evaluated
Leptotyphlopidae	*Leptotyphlops*	*scutifrons*	*scutifrons*	Peters' Thread Snake	Not evaluated
Pelomedusidae	*Pelomedusa*	*galeata*		South African Marsh Terrapin	Not evaluated

Pelomedusidae	*Pelomedusa*	*subrufa*		Central Marsh Terrapin	Least Concern
Scincidae	*Acontias*	*gracilicauda*		Thin-tailed Legless Skink	Least Concern
Scincidae	*Panaspis*	*wahlbergii*		Wahlberg's Snake-eyed Skink	Least Concern
Scincidae	*Trachylepis*	*capensis*		Cape Skink	Least Concern
Scincidae	*Trachylepis*	*punctatissima*		Speckled Rock Skink	Least Concern
Scincidae	*Trachylepis*	*varia*		Variable Skink	Least Concern
Testudinidae	*Stigmochelys*	*pardalis*		Leopard Tortoise	Least Concern
Typhlopidae	*Afrotyphlops*	*bibronii*		Bibron's Blind Snake	Least Concern
Typhlopidae	*Rhinotyphlops*	*lalandei*		Delalande's Beaked Blind Snake	Least Concern
Viperidae	*Bitis*	*arietans*	*arietans*	Puff Adder	Least Concern
Viperidae	*Causus*	*rhombeatus*		Rhombic Night Adder	Least Concern

13 ANNEX 3. LIST OF AMPHIBIANS

List of amphibians which are likely to occur in the vicinity of the Siyathemba study area.

Family	Genus	Species	Common name	Red list category	No. records
Brevicepitidae	*Breviceps*	*adspersus*	Bushveld Rain Frog	Least Concern	1
Bufonidae	*Schismaderma*	*carens*	Red Toad	Least Concern	20
Bufonidae	*Sclerophrys*	*capensis*	Raucous Toad	Least Concern	20
Bufonidae	*Sclerophrys*	*garmani*	Olive Toad	Least Concern	3
Bufonidae	*Sclerophrys*	*gutturalis*	Guttural Toad	Least Concern	99
Hyperoliidae	*Kassina*	*senegalensis*	Bubbling Kassina	Least Concern	70
Hyperoliidae	*Semnodactylus*	*wealii*	Rattling Frog	Least Concern	25
Phrynobatrachidae	*Phrynobatrachus*	*natalensis*	Snoring Puddle Frog	Least Concern	7
Pipidae	*Xenopus*	*laevis*	Common Platanna	Least Concern	35
Pyxicephalidae	*Amietia*	*delalandii*	Delalande's River Frog	Least Concern	67
Pyxicephalidae	*Amietia*	*fuscigula*	Cape River Frog	Least Concern	36
Pyxicephalidae	*Amietia*	*poyntoni*	Poynton's River Frog	Not evaluated	2
Pyxicephalidae	*Cacosternum*	*boettgeri*	Common Caco	Least Concern	108
Pyxicephalidae	*Pyxicephalus*	*adspersus*	Giant Bull Frog	Near Threatened	11
Pyxicephalidae	*Strongylopus*	*fasciatus*	Striped Stream Frog	Least Concern	11
Pyxicephalidae	*Tomopterna*	*cryptotis*	Tremelo Sand Frog	Least Concern	27
Pyxicephalidae	*Tomopterna*	*natalensis*	Natal Sand Frog	Least Concern	42