2018

DRAFT SCOPING REPORT FOR THE PROPOSED DEVELOPMENT OF 2X500MVA 400/132kV ESKOM INYANINGA SUBSTATION, APPROXIMATELY 100KM INYANINGA – MBEWU 2x400kV POWERLINES AND ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF ETHEKWINI METROPOLITAN MUNICIPALITY, ILEMBE AND UTHUNGULU DISTRICT MUNICIPALITIES IN KWAZULU-NATAL PROVINCE

JULY 2018

NSOVO
ENVIRONMENTAL CONSULTING

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EXECUTIVE SUMMARY

Eskom Holdings SOC Limited (Eskom) is proposing to strengthen the support of electricity to the Kwazulu-Natal region. Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed by Eskom Holdings SOC Limited, as the independent environmental consultant, to investigate the potential environmental impacts of the proposed project. The proposed project will consist of the following activities and infrastructure:

- Construction and operation of the new 2x500MVA 400/132kV Inyaninga substation and ancillaries (control building, admin building, telecommunication lattice mast, and associated infrastructure); and
- Construction of a new Inyaninga-Mbewu 2X400kV powerlines (approximately 100km) from the new Inyaninga Substation to the authorised Mbewu substation and associated infrastructure .

The project site is located within the eThekwini Metropolitan Municipality (Wards 61 and 62), iLembe District (Wards 1, 3, 5, 7, 8, 9, 10, 11, 17, 21, 25 and 27)and uThungulu District (Wards 10, 11, 16, 17, 18, 19, 20, 21, 22, 23 and 24) in the KwaZulu-Natal Province.

In terms of the Environmental Impact Assessment (EIA) Regulations published in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended) (herein referred to as NEMA), the proposed development triggers activities which require Eskom to obtain an Environmental Authorisation (EA) from the National Department of Environmental Affairs (DEA) prior commencing with the construction activities. The description of listed activities which triggers the EIA process is listed in Table 1 below. In terms of the National Water Act (Act no 36 of 1998), a Water Use Licence (WULA) is required for watercourse crossings along the powerline route.

This Scoping Report for the proposed development contains the following:

- The details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the report;
- The location of the proposed activities;
- A plan which locates the proposed activities to be undertaken;
- Description of the scope of the proposed project including the listed activities and the associated structures and infrastructures;
- Description of policy and legislative content within which the development is located and an explanation of how the development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability of the proposed development;
- A full description of the process followed to reach the proposed preferred activities, site and proposed location of the development footprint within the site;
- A plan of study for undertaking the EIA process to be undertaken; and

- An undertaking under oath or affirmation by the EAP.

Four site alternatives for the proposed substation were identified, *viz.* site alternative B, F, X and X3. Subsequently, one alternative will be considered based on the recommendations from the specialist reports and the assessment of the impacts by the EAP. In addition to substation alternatives, three corridors were identified and assessed for the proposed powerlines, *viz.* corridor 1, 2 and 3. Detailed information of all the alternatives considered including site, lay-out, technology and no-go alternatives are discussed in section 7.1 of this report.

This report was made available to the Interested and Affected Parties (I&APs) as well as Organs of State for a period of thirty (30) days in order to afford them an opportunity to review and comment. All comments received are included in the Comments and Response Report which forms part of this report. The Plan of Study for the EIA is also incorporated in this report and is submitted to the Competent Authority (CA) (the DEA) in terms of section 24C of National Environmental Management Act (NEMA). The DEA will assess the draft scoping report and the plan of study for EIA and advice as to whether the project should go into EIA phase or not.

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DOCUMENT CONTROL

PROJECT TITLLE :		
Draft scoping report for the proposed development of 2x500MVA 400/132kV Eskom Inyaninga substation, approximately 100km Inyaninga – Mbewu 2x400kV powerlines and associated infrastructure within the jurisdiction of eThekwini Metropolitan Municipality, ILembe and UThungulu District Municipalities in KwaZulul-Natal province.		
Quality Control		
Report:	Compiled By:	Peer Reviewed By:
Draft Scoping Report	Masala Mahumela _____	Munyadziwa Rikhotso _____

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LIST OF ACRONYMS AND ABBREVATIONS

ARC	Agricultural Research Council
CBA	Critical Biodiversity Area
CLN	Customer Load Network
DEA	Department of Environmental Affairs
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
HV	High Voltage
I&APs	Interested and Affected Parties
km	Kilometres
kV	Kilovolts
MTS	Main Transmission Substation
Mm	Millimetre
NEMA	National Environmental Management Act
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
Tx	Transmission
WULA	Water Use Licence Application

1 INTRODUCTION

Nsovo Environmental Consulting has been appointed by Eskom Holdings SOC Limited (hereafter referred to as Eskom) to undertake the Environmental Impact Assessment (EIA) study in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the EIA Regulations of December 2014 (as amended in April 2017) for the development of the new 2X500MVA 400/132kV Inyaninga substation, approximately 100km Inyaninga – Mbewu 400kV powerlines and associated infrastructure within the jurisdiction of the eThekwini Metropolitan Municipality (eThekwini), iLembe and uThungulu District Municipalities in the KwaZulu-Natal Province.

The eThekwini Electricity forms part of the Pinetown CLN (Customer Load Network) within the KwaZulul-Natal Operating unit (KZN OU). The eThekwini electricity network has four 275kV Transmission in-feeds from Georgedale, Hector, Illovo and Avon substations to the following substations:

- Avon Substation supplies Ottawa and Durban North Substations;
- Georgedale and Hector Substations supply Klaarwater Substation;
- Ilovo Substation supplies Durban South and Lotus Park Substations; and
- Hector substation supplies Klaarwater substation

The load forecast shows load demand doubling in the geographical area supplied by Ottawa and Durban North Substations in the next 20 years. The area supplied by Klaarwater is expected to grow by 20% and the area supplied by Durban South and Lotus Park Substations is expected to grow by 30% over the same period. Consequently, Eskom proposes the new Inyaninga substation and the Inyaninga-Mbewu 400kV powerline in order to cater for future electricity needs.

The fundamental aim of the proposed development is to provide and meet the needs and demands of the present and future generations within the surrounding communities in terms of the provision of electricity in KwaZulu-Natal and the country as a whole. The proposed development will directly and indirectly improve the standard of living for the Kwazulu-Natal communities as it will create employment opportunities, generate income and contribute to local economy development as well as the country as a whole.

In summary, the proposed project will consist of the following activities and infrastructure:

- Construction and operation of the new 2x500MVA 400/132kV Inyaninga substation and ancillaries; and
- Construction of the new Inyaninga-Mbewu 2X400kV powerlines (approximately 100km long) and associated infrastructure.

Four site alternatives for the proposed Inyaninga substation were identified, *viz.* site alternative B, F, X and X3. Subsequently, one alternative will be considered based on the recommendations from the specialist reports and the assessment of the impacts by the EAP. In addition to substation alternatives, three corridors were identified and assessed for the proposed transmission powerline, *viz.* corridor 1, 2 and 3. Detailed information of all the alternatives considered including site, lay-out, technology and no-go alternatives are discussed in this report.

The study area required for the substation is approximately 800m x 800m (i.e. 640 000m^2). Therefore the substation footprint will be anywhere within the study area. The proposed turn-in powerlines will be approximately 100km 400kV, however, the final distance will be determined by the substation location. The proposed substation site will be located closer to the existing Mbewu substation for Eskom distribution as well as eThekwini Municipality to connect easily and also reasonably close to the existing 400kV powerline for transmission to connect.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed by Eskom Holdings SOC Limited as the independent Environmental Assessment Practitioner (EAP) for the proposed project. Nsovo meets the general requirements for Environmental Assessment Practitioner (EAP) indicated in the EIA Regulation 13 (1). Nsovo is:

- Independent and Objective;
- Has expertise in conducting EIA's;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

Table 1 below provide details of the EAP and relevant experience. A detailed CV and Qualifications of the responsible person are attached as Appendix E.

Table 1: Details of the Environmental Assessment Practitioner (EAP)

Name of Company	Nsovo Environmental Consulting
Person Responsible	Masala Mahumela
Professional Registration	South African Council for Natural Scientific Professions (SACNASP)
Postal Address	P/Bag x29 Postnet Suite 697 Gallo Manor 2052
Telephone Number	011 041 3689
Fax Number	086 602 8821
Email	masala.mahumela@nsovo.co.za
Qualifications & Experience	B.Sc. Honours Environmental Management **10 Years of experience.**
Project Related Expertise	In terms of project related expertise the EAP has completed the following projects: • EMPr, WULA and EA amendment for the proposed Juno Gromis 400kV power line • Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power. • BAR for the proposed Abersethin Substation and loop in and out power lines in Bethlehem. • Basic Assessment for Bloemendal Substation and loop in and out lines. • BAR for the proposed Abersethin Substation and loop in and out power lines in Bethlehem. • EIA, EMP and WULA for Senakangwedi- Senakangwedi B Integration in Limpopo. • EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.

3 DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY

This section provides a description of the locality and property on which the activity is to be undertaken as well as the environmental aspects affecting or affected by the proposed development.

3.1 LOCALITY OF THE PROPOSED PROJECT

3.1.1 PROVINCE

The proposed project is located in KwaZulu-Natal province which is located in the South-East of South Africa along the Indian Ocean. It borders the Eastern Cape, Free State and Mpumalanga provinces as well as Lesotho, Swaziland and Mozambique.

3.1.2 MUNICIPAL WARDS

The proposed project will traverse various communal and private owned farms within the Municipalities and Wards indicated in Table 2 below:

Table 2: Details of the Municipalities and their wards within the proposed area

Municipality	Local Municipality	Ward Number
eThekwini Metropolitan Municipality	EThekwini	58, 60, 61 and 62
iLembe District Municipality	KwaDukuza	1, 3, 7, 9, 17, 21, 22, 25 and 27
	Mandeni	3, 4, 5, 6, 8, 9, 10,11, 12, 16 and 17
	Maphumulo	7
	Ndwedwe	1, 2, 3, 4, 6, 7, 8, 10, 11 and 12
uThungulu District Municipality	City of uMhlathuze	10, 11, 24, 25 and 29
	Ntambanana	7
	uMlalazi	14, 15, 16, 17, 18, 19, 20, 21, 22, 23 and 24

3.1.3 AFFECTED FARMS

The farms affected by the proposed project together with the 21-digit Surveyor General Code are presented in **Appendix G.** The GPS centre points coordinates for the alternatives substation sites and corridors are indicated in Table 3 and 4 respectively below.

3.1.4 COORDINATES

Tables 3 and 4 below provide coordinates of the proposed substation sites as well as powerline corridors.

Table 3: The GPS coordinates of the centre points for the substation alternative sites

Substation Alternative Site	Latitude	Longitude
Inyaninga Alternative site B	29°35'05.143"S	31°04'16.697"E
Inyaninga Alternative site F	29°32'07.911"S	31°06'38.658"E
Inyaninga Alternative site X	29°30'43.215"S	31°09'00.819"E
Inyaninga Alternative site X3	29°35'56.522"S	31°05'01.035"E
Existing Avon substation	29°25'02.003"S	31°09'39.009"E
Existing Mbewu substation	28°42'19.029"S	31°45'36.077"E
Existing Durban North substation	29°35'02.008"S	31°03'54.086"E

Table 4: Start, middle and end coordinate of the three proposed corridors under consideration

Corridor	Start	Middle	End
Corridor 1	28°42'21.33"S 31°45'50.16"E	29°10'48.96"S 31°20'40.90"E	29°36'34.28"S 31°05'13.76"E
Corridor 2	28°42'21.33"S 31°45'50.16"E	29°10'56.43"S 31°25'06.98"E	29°32'09.00"S 31°06'28.62"E
Corridor 3	28°42'21.33"S 31°45'50.16"E	28°52'02.70"S 31°37'08.34"E	29°04'16.46"S 31°23'26.77"E

3.1.5 LOCALITY MAP

Figure 1 below (locality map) depicts the proposed study area at a scale of 1:50 000. The proposed study area is characterised by farming activities (dominated by sugarcane), residential developments and natural forests and open land (See Figures 2). Furthermore, this area is also characterised by undulating rolling hills along the corridors.

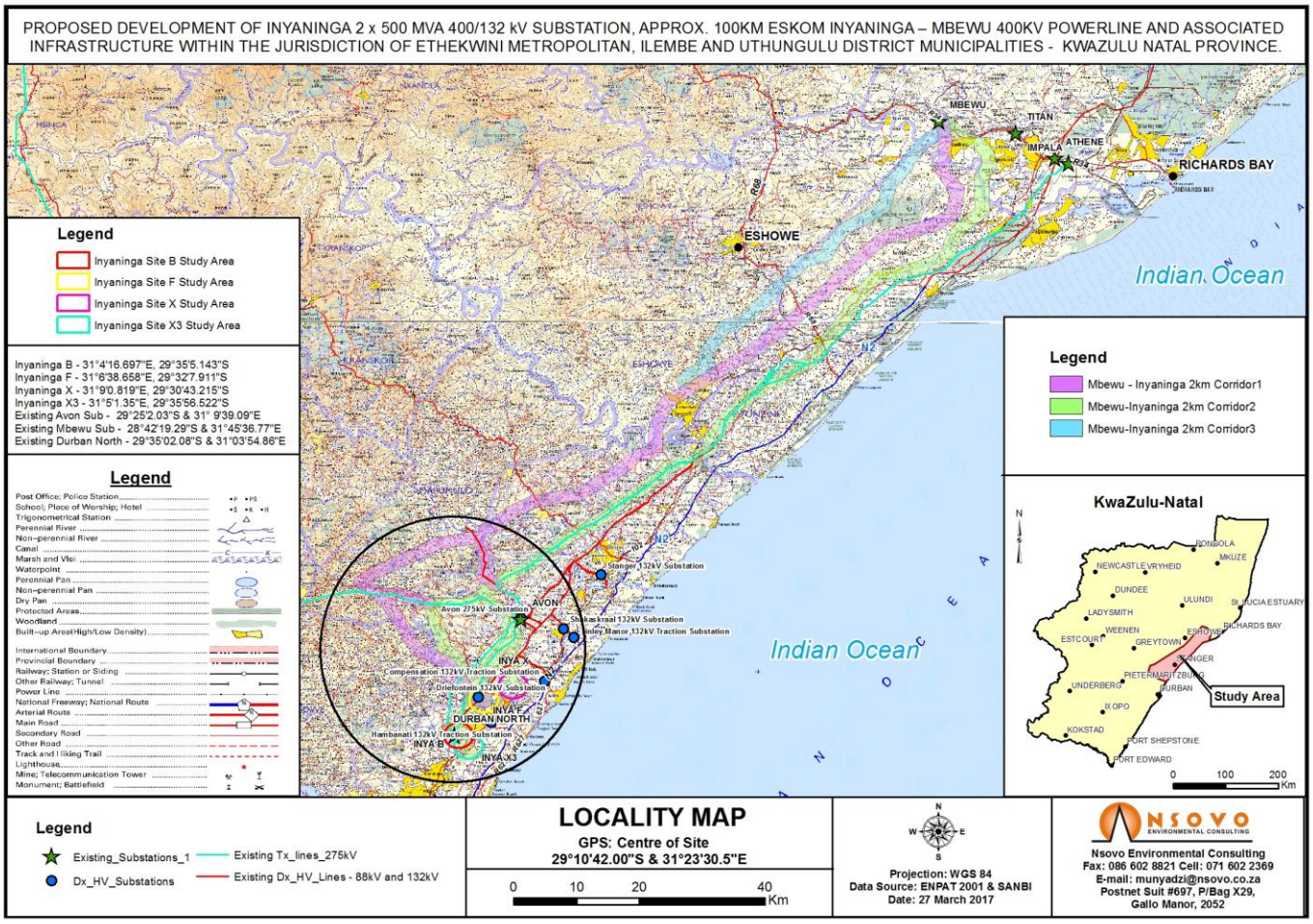

Figure 1: Locality map of the proposed project showing site alternatives and proposed power line corridors

3.2 SURROUNDING LAND USES

3.2.1 FARMING

Majority of the proposed study area has been transformed by intensive agriculture with all four substation site alternatives falling within agricultural land which is mainly used for the sugarcane cultivation (See Figure 2A) and pine plantation (See Figure 2B). However, other practices such as horse rearing and subsistence farming are also taking place.

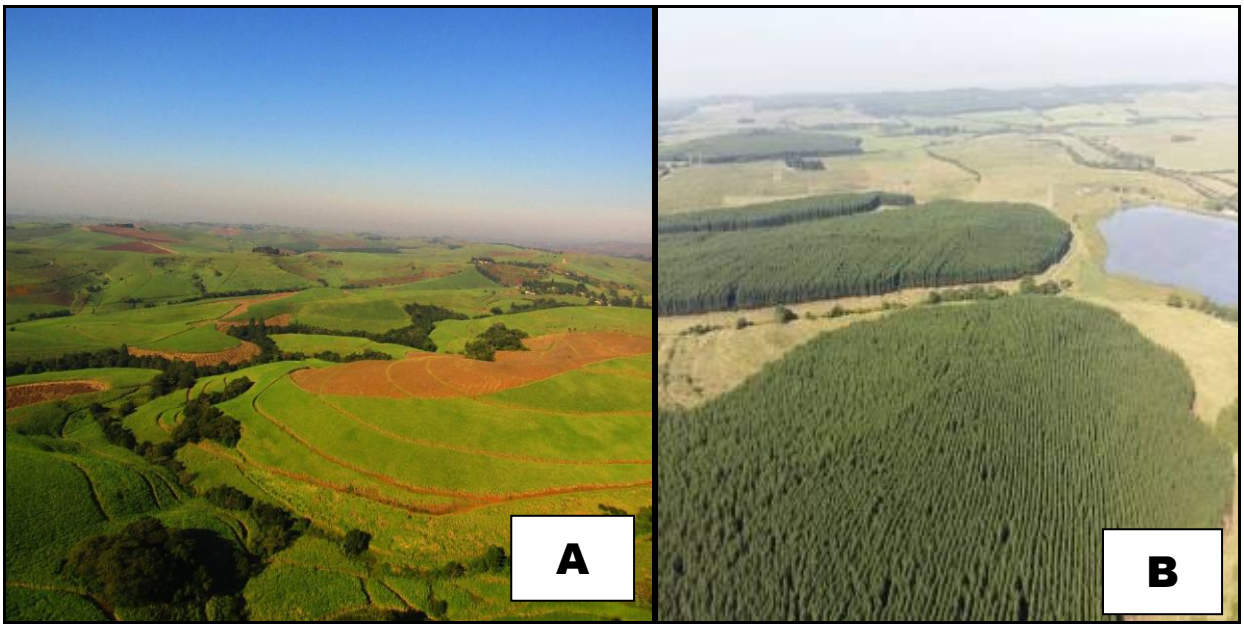

Figure 2: Photograph A shows sugarcane plantation while photograph B shows pine tree plantation

3.2.2 RESIDENTIAL

The residential properties located along the study area are rural communities and subsistence farming is also taking place particularly within low density residential areas.

3.2.3 COMMERCIAL AND INDUSTRIAL

The main economic sectors within the affected Municipalities are indicated in Table 5 below.

Table 5: Main economic sectors (Integrated Development Plan (IDP), 2017)

Economic Sectors	Percentage Contribution
Finance	22%
Manufacturing	22%
Community services	18%
Trade	16%
Transport	16%
Construction	3%
Electricity	2%

3.2.4 SURFACE INFRASTRUCTURE

3.2.4.1 Road Network

The proposed study area traverses inland parallel the N2 and R102. The N2 is a national route in South Africa that runs from Western Cape Province (i.e. Cape Town) through Eastern Cape Province (i.e. Port Elizabeth and East London) through KwaZulu-Natal province (i.e. eThekwini which is the proposed study area) ending in Mpumalanga Province. It is the main highway along the Indian Ocean coast with a total distance of 2,255km.

3.2.5 POWER LINES AND ASSOCIATED INFRASTRUCTURE

There are several other existing power lines and substations located along the proposed area. Existing substations include the Avon and Durban North while the proposed powerline will loop into the authorised Mbewu substation.

4 DESCRIPTION OF THE SCOPE PROPOSED ACTIVITIES

This section provides the description of the proposed activities with specific focus on the listed activities which triggers the EIA process.

4.1 BACKGROUND AND THE PROPOSED SCOPE OF WORK

As indicated above, the eThekwini electricity network has four 275kV Transmission in-feeds from Georgedale, Hector, Illovo and Avon Substations. The load forecast shows load demand doubling in these geographical areas; consequently, Eskom proposes the development of the Inyaninga Substation and associated 2x400kV Inyaninga-Mbewu powerlines in order to cater for future electricity demands.

Subsequently, the proposed scope of work entails primarily the development of the following:

- Construction and operation of the new Inyaninga 2x500MVA 400/132kV and ancillaries; and
- Construction of approximately 100km, 2X400kV Inyaninga-Mbewu powerlines to be connected from the new Inyaninga substation to the Mbewu substation.

4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT

The construction phase of the proposed project is expected to take approximately 3 years. This section describes the key activities to be undertaken as part of the planning and construction phases of the project.

4.2.1 CORRIDOR WALK-DOWN

Prior to commencement of construction activities, a corridor walk down will be undertaken as part of final construction EMPr compilation. The main aim of conducting the corridor walk-down is to ensure that sensitive areas are identified, avoided where need be and buffers are created for conservation purposes.

4.2.2 ACCESS ROADS

Primary access to the proposed sites will be through the N2 and/or R102 while secondary access will be public roads as well as private farm roads negotiated with land owners. However, where there is no access, both permanent and temporary roads may need to be established; therefore the establishment phase will entail the development of a road wider than 4 metres with a reserve less than 13, 5 metres. The proposed temporary access road will be 6m wide while the permanent road will be 7m; both roads will be compliant with the requirements of gravel road; construction which comprises of raised gravel extended with meadow drainage in flat terrain, with additional meters to cater for the 'V' type drainage in rolling terrain. Where necessary, suitable erosion control measures such as the construction of gabions and culverts to control storm-water will be implemented.

4.2.3 VEGETATION CLEARANCE

Fifty five meter (55m) servitude will be required for each of the proposed 2x400kV powerlines. As such, flora located within the immediate construction footprint will be cleared for construction purposes. Clearance of the affected flora shall be in accordance with the requirements of the Environmental Management Programme (EMPr) as well as Eskom's policies and guidelines.

4.2.4 CONSTRUCTION OF SUBSTATION AND ERECTION OF PYLONS

The civil works will include the establishment of foundations for the proposed Inyaninga substation, powerline and associated infrastructure.

4.2.5 STEELWORKS STRUCTURES

Various types of pylons are under consideration and final selection will depend on the terrain and the possible visual aspects of the selected pylon will be taken into consideration. The pylons are usually transported in segments and assembled on site; which will be the case with the proposed project.

4.2.6 STRINGING

Once the pylons have been erected, the conductors will be strung between the pylons and bird guards installed as recommended by the specialists.

4.2.7 TELECOMMUNICATION MAST

The proposed development will also involve the installation of a telecommunication lattice mast at the substation that will be used for communication purposes.

4.2.8 COMPLETION OF CONSTRUCTION WORK

Once construction work is complete, the site will be rehabilitated as per the specifications of the EMPr and approved Method Statements, among other activities. The rehabilitation activities will include:

- Removal of excess building material and waste;
- Repairing any damage caused by construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous vegetation where necessary

4.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

Table 6: Listed Activities applicable to this project

Listed activities	Activity/Project description
GN R. 984 Item 9: The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	The proposed project entails the development of approximately 100 km Inyaninga-Mbewu 2X400kV electricity transmission powerline
GN R. 983 Item 12: "The development of– (ii) infrastructure or structures with a physical footprint of 100 square metres or more;	The proposed project entails the development of Eskom Inyaninga 2x500MVA substation with a physical footprint of more than 100 square metres which may be developed within or in close

Listed activities	Activity/Project description
Where such development occurs – (a) within a watercourse"; or (c) If no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	proximity to a watercourse. The proposed 100km 2x400kV powerline will require a total of 110m servitude and it is anticipated that some of the pylons may be developed within or in proximity to watercourses.
GN R. 985 Item 3 The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes, where the mast or tower- a) Is to be placed on as site not previously used for this purpose; and b) Will exceed 15m in height. **d. KwaZulu-Natal** vi) a protected area identified in terms of NEMPAA, excluding conservancies; viii) Critical Biodiversity areas as identified in systematic biodiversity plans adopted by competent authority or in bioregional plans	The proposed substation will require installation of a telecommunication lattice mast of more than 15m that will be used for communication purposes. The mast will be placed on a site that that was not previously used for this purpose in proximity to protected areas.
GN R. 985 Item 4: "The development of a road wider than 4 metres with a reserve less than 13, 5 metres. **d. KwaZulu-Natal** (vi). A protected area identified in terms of NEMPAA (vii). Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans (xii) Outside the urban areas; (as) Areas within 10 kilometres from the national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core	Additional access roads wider than 4 metres with reserve less than 13.5 meters will be constructed within protected areas and CBA outside urban areas. Moreover, the road would be used during both construction and operations of the proposed substation and 400kV power line.

Listed activities	Activity/Project description
areas of biosphere reserve".	

5 APPLICABLE LEGISLATION AND GUIDELINES

Appendix 2 of the EIA Regulations, section 1(e), requires that a description of applicable legislations be included in the scoping report. Therefore, this section list and describe the Acts and legislations applicable to the development of the proposed project. The subsequent section presents a list of the current South African environmental legislation, which is considered to be pertinent to the development and operation of the proposed project. A description of legislation pertaining to the project is summarised in Table 7 below.

The list of legislations that are applicable to the project is not an exhaustive analysis; however, it provides a guideline to the relevant aspects of each Act.

Table 7: Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	• National Environmental Management: Act 1998, (Act No. 107 of 1998) as amended. • Environmental Impact Assessment Regulations, December 2014 as amended in April 2017	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) apply to all listed projects. Construction and operation of activities have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors. The Environmental Impact Assessment (EIA) process followed is in compliance with the NEMA and the Environmental Impact Assessment Regulations of December 2014 as amended The proposed development involves "listed activities", as defined by NEMA. Listed activities are an activity which may potentially have detrimental impacts on the environment and therefore require Environmental Authorisation (EA) from the relevant Competent Authority, in this case DEA.

Aspect	Relevant Legislation	Brief Description
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004(Act 39 of 2004)	The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act makes provision for measures to control dust, noise and offensive odours. Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it provides that the Minister or

Aspect	Relevant Legislation	Brief Description
		MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance or other measures aimed at the control of dust.
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation , 1989 (Act 73 of 1989).
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of law relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. It is highly likely that proposed project will traverse or encroach on water resources; therefore the necessary licence will be obtained in due course.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act Agriculture has been identified as one of the primary activities within the study area; predominantly sugar cane farming. It is highly likely that the proposed activities will impact the agricultural activities.

Aspect	Relevant Legislation	Brief Description
Human Rights	The Constitution of South Africa, 1996 (Act No. 108 of 1996	The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). The state is obliged "to respect, protect, promote and fulfil the social, economic and environmental rights of everyone…" The environmental right states that: "Everyone has the right - a) To an environment that is not harmful to their health or well-being; and b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that - -Prevent pollution and ecological degradation; -Promote conservation; and -Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."
Waste	National Environmental Management: Waste Act 59 of 2008	This act provide fundamental reform of the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This act also ensures the provision of national norms and standards for regulating the management of waste by all spheres of government. The National Environmental Management: Waste Act provides for specific waste management measures; licensing and control of waste management activities; remediation of contaminated land; compliance and enforcement; and for matters connected therewith.

In preparation of the scoping report, these Acts were read with absolute consideration of municipal policies, plans and by-laws as well as consideration of Eskom policies and world best practices.

6 DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

This section provide the justification for the need of the proposed project to be undertaken mainly focusing on the benefits and importance of the proposed project to the people of KwaZulu-Natal and the country as a whole. The motivation and the need of the proposed project are discussed as follows:

6.1 MOTIVATION FOR THE DEVELOPMENT

Eskom Transmission's ten years plan indicates that a reliable electricity supply of acceptable quality is essential for the economic development of South Africa. It is also a prerequisite for socio-economic development, as it paves the way to access to education, improved nutrition and health care, and jobs, amongst others. The transmission system plays a vital role in the delivery of a reliable, high quality electricity supply throughout the region and South Africa at large, by delivering electricity in bulk to load centres and end-users. From there, the distribution networks owned by Eskom and municipalities deliver electricity to end-users. The transmission system needs to be well-maintained to deliver a reliable supply of electricity, and it also needs to be strengthened to meet changing customer needs.

Consequently, the proposed Inyaninga substation and associated powerline form part of the Network Strengthening which is driven by industries and agriculture (i.e. mainly sugarcane plantation around proposed location) and it forms part of the new infrastructure that Eskom has planned, the objective being to ensure reliable electricity supply.

The proposed project will ensure the following:

- That the supply link between the planned Mbewu substation and the proposed Inyaninga substation supply network is strengthened; and
- Improvement in reliability of electricity supply which will benefit agriculture, tourism, residential and industries in the area; and Improvement of South Africa's socio-economic status.

6.2 BENEFITS OF THE PROJECT

The proposed project is beneficial as it will allow for load growth in the region. It is envisaged that the proposed development would ensure reliable supply to industry, predominantly the agricultural, tourism, residential and manufacturing industries in the area; this will indirectly benefit communities as reliable electricity will result in uninterrupted production and therefore growth in industry, which could potentially yield additional jobs. The overarching impact will be positive economic spinoffs, which benefit the community, the region and country at large.

Electrification has significant positive benefits from a socio-economic and ecological perspective. The provision of electricity leads to a number of social benefits for organs of state, individuals, industries and communities including the following:

- Enables development; and Encourages small and medium enterprise development, and as a result, contributes to a possible increase in disposable income.

6.2.1 SUPPORTING STRATEGIES

At the regional level, the project would contribute to reliability of power supply. There would also be a less tangible but nonetheless important benefit of positioning the Municipality ahead in terms of sustainable energy supply. At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (DME 1998). The priorities to which this project would contribute are laying the groundwork for enhancing power supply and electrification capacity.

7 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN THE SITE

The identification of alternatives is an important component of the EIA process. The identified alternatives were assessed in terms of environmental acceptability, technical as well as economic feasibility during the EIA process wherein the preferred alternative is highlighted and presented to the Authorities.

Four alternative substation sites and the no-go alternative are being considered for the proposed Inyaninga 2x500 MVA 400/132Kv substation, while 3 corridors are considered for the proposed 2X400kV powerline. The 2x400kV powerline will be constructed to connect from the proposed Inyaninga substation to the authorised Mbewu substation. The final corridor will be determined by the location of the Inyaninga substation site. The project has considered technical alternatives (Section 7.1) of which were found to be economically and environmentally viable compared to other options. The alternatives are presented as part of this scoping report and will be assessed further during the EIA phase.

The selection of project alternatives was primarily based on Eskom's prefeasibility study that technically determined the broad location based on the need. Subsequent site visits were undertaken by the engineering, the design, environmental and specialist teams. Further a detailed public consultation is being undertaken to assess the viability of the selected alternative sites which resulted in the identification of more sites for consideration to assess the economic need and desirability of the project, the site selection process also focused on reviewing the municipal Integrated Development Plan, Eskom's 10 Year Development Plan, and associated documents that address current and future development in and around the area.

7.1 DETAILS OF ALTERNATIVES CONSIDERED

This section describes, in detail, all the alternative considered for the proposed substation, powerline and associated infrastructures. This includes the technical, structural, site (location) and no-go alternatives which are discussed as follows:

7.1.1 TECHNICAL ALTERNATIVES

Two technical alternatives have been identified for the proposed project i.e. the overhead powerline and underground cabling. Instead of constructing the proposed powerline above ground, underground construction is considered to be an alternative. The advantages of the underground alternative would include a reduced impact on bird interaction and a distinct visual impact benefit.

However, the underground powerline alternative would not be the most feasible for the proposed project owing to the undulating nature of the area. This could cause major technical problems and would have major cost implications. Technically, underground cables need to be insulated against the surrounding soil. On low voltage reticulation networks (11kV & 22kV) the heat generated by the cable is low enough for standard insulation to be used; however, on larger power lines (e.g. 400kV as proposed) the method of electrical and heat insulation becomes more burdensome.

Control of electrical losses and heat control are critical for underground cables. As a result, cables are as much as 4 times the diameter and 10 times the weight of equivalent overhead lines. Heat control is also a factor in the laying of the cables. The three phases of low and medium voltage cables (up to 132kV) can be placed in the same trench, while the phases for high voltage cables must be spaced apart, typically in a flat formation.

Bush fires, lightning strikes and bird related faults make up 80% of faults on overhead transmission power lines in South Africa; however, such risks are not associated with underground cables. Further, faulting on underground cable is rare. When faults occur on overhead lines they are usually re-energised by automatically reclosing the circuit-breaker within a few seconds of the fault. More serious faults, such as a damaged line may be easily found and repaired within a few days at most. Underground cables have faults that are almost exclusively permanent, requiring inspection and correction on site. This usually requires excavating a section of the powerline. As a result, finding the location of faults is not easy unless there is clear evidence of excavation damage. Therefore, the search and repair of underground cables can take several weeks. This may severely compromise the network of the operation.

Economically, costs vary and are dependent on terrain, land use and size of line. However, underground cabling is in orders of magnitude greater than overhead power lines. Underground 132kV is 3 to 10 times more expensive than overhead lines. There is not much expertise for higher voltage underground cabling in the country; as a result such expertise would have to be sourced from the international market.

In terms of maintenance, underground cables are reported to be much more reliable, but outages are more difficult to fix as it is harder to find the faults, and therefore the outages last much longer. The lifespan for underground cables is reported to be much shorter, about half that of overhead power lines.

None of the two alternatives are dismissed, as such; they will be assessed further during the EIA phase.

7.1.2 STRUCTURAL ALTERNATIVES

Several design alternatives have been proposed and they include one or more of the following pylons:

- Cross-Rope suspension type;
- Self-supporting type; and
- Guyed V towers.

The above designs are illustrated in Figures 4, 5, 6, 7, 8 and 9 below. It is important to note that the topography will largely dictate the types of towers to be used. From this perspective, it should be noted that where the line crosses undulating terrains and when it changes direction at an angle, there will be a need to use self-supporting towers.

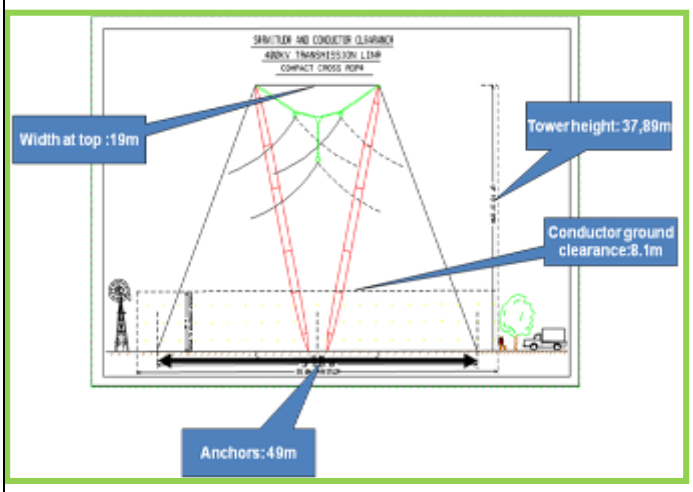

Figure 3: Guide V tower

Figure 4: Photographic Guide V tower

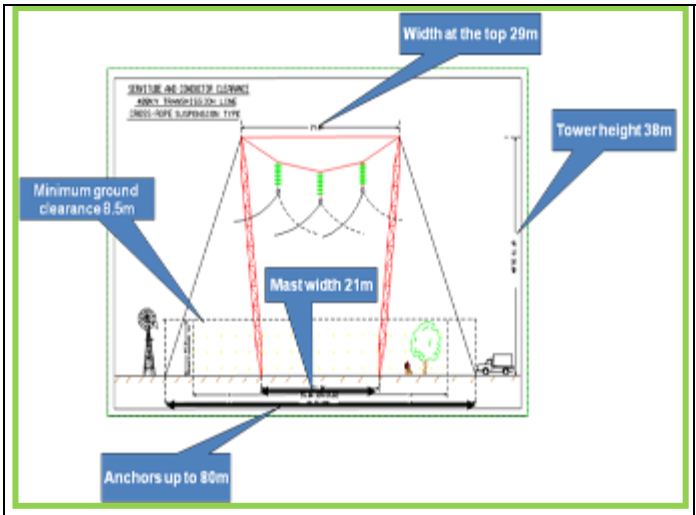

Figure 5: Cross rope suspension tower.

Figure 6: Photographic illustration of a Cross rope suspension tower.

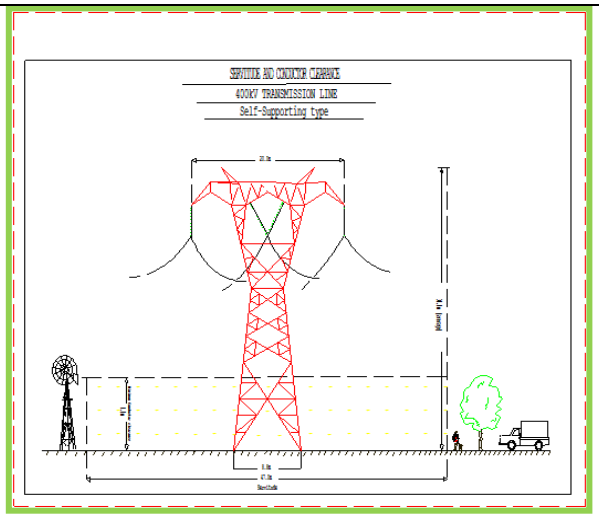

Figure 7: Self-supporting suspension tower.

Figure 8: Photographic Self-supporting suspension tower.

None of the above options have been dismissed and remain as design alternatives depending on the terrain and topography. The comments received from stakeholders regarding the visual and environmental impacts of the proposed project will be taken into consideration during the selection of the pylons to be used. Consequently, the pylon with the least visual impact will be considered.

7.1.3 SITE ALTERNATIVES

This section provides a description of the site alternatives considered for the proposed substation. The no-go alternative was also considered as the option of not proceeding with the development.

Four locations were proposed for the Inyaninga substations, *viz.* Inyaninga B, F, X and X3. The propose substation alternatives are located southwards from the proposed corridors and are all within the same vicinity; which is characterised by residential communities, fairly undulating, river sensitive zones as well as industrial buildings on the southern end of the proposed powerline.

a) Substation Site Alternative B

The substation Alternative Site B (Site B) is situated within an area that has been largely transformed as a result of agricultural activities, predominantly sugarcane cultivation. Two main suburban residential areas are present within the substation alternative. The substation site buffer overlaps with substation Site Alternative X3. Site B is subject to fairly significant sources of existing disturbance from the neighbouring farmlands and residential areas.

Table 8: Summary of Specialist Findings-Site Alternative B

Specialist	Description
Heritage	Site B is located on an area which is farmed throughout and fairly undulating, these areas are also characterised by industrial buildings on the southern section.
Wetland	A number of wetland systems were delineated at a desktop level including both seeps and channelled valley bottom wetlands. A number of drainage channels and riparian zones were also delineated. Site B is subject to fairly significant sources of existing disturbance from the neighbouring farmlands, residential areas.
Agricultural Potential	Site B is characterised by soils of Fa land types which are generally shallow soils on weathering rock and Ea soils which are dark clay soils.
Avifauna	Site B is wholly transformed by sugarcane cultivation and is subject to fairly significant sources of existing disturbance from the neighbouring farmlands and residential areas.
Fauna & Flora (Biodiversity)	Irreplaceable CBAs occur in small patches associated with remnant indigenous vegetation at Site B. However, in general, the substation sites are within highly transformed environments and can be positioned to avoid any impact to important biodiversity features.

7.1.3.1 Substation Site Alternative F

This proposed site alternative is also found within residential areas. The buffer associated with Substation Site Alternative F (Site F) is situated to the north of Substation Site Alternative B. Patches of sugarcane cultivated land are available for the development of the substation in areas outside of the seepage systems.

Table 9: Summary of Specialist Findings-Site Alternative F

Specialist	Description
Heritage	Site F is the least preferred site from a heritage perspective.
Aquatic ecology	Site F is the least preferred site from an aquatic ecology perspective; it has the closest proximity to aquatic environments.
Wetland	The buffer associated with Site F is situated to the north of substation Site B. A large unchannelled valley bottom system flows through the entire substation buffer site associated with the confluence of the Tongati and Mona Rivers. Further, several channelled valley bottom wetlands and seep systems were also delineated at a desktop level. The Tongati River forms a steeply incised valley through the substation buffer site, which is not suitable for development. Patches of sugarcane cultivated land are available for the development of the substation in areas outside of the seep systems.
Agricultural Potential	The majority of Site F is covered by soils of Fa with certain sections of the site covered by soils of Ea and Aa land types. Fa soil types are generally shallow soils on weathering rock; however, Ea soils are dark clay soils.
Avifauna	Site F is also located between two residential areas and is largely comprised of sugarcane. However, pockets of indigenous riparian woodland, associated with the Tongati River set this site apart from the Inyaninga B and Inyaninga X3 substation sites to the south.
Flora and Fauna (Biodiversity)	Site F is located close to a CBA to a greater extent than sites B and X3. It is located within a transformed environment where impacts on biodiversity would be low and no significant impacts on terrestrial ecosystems can be expected. .

7.1.3.2 Substation Site Alternative X

Substation site Inyaninga X (Site X) is the most northerly substation site alternative which lies to the north-east of substation site Inyaninga F and is also characterized by sugarcane farmlands, road networks as well as a large dam known as the Dudley Pringle Dam.

Table 10: Summary of Specialist Findings-Site Alternative X

Specialist	Description
Wetland	A number of channelled valley bottom wetlands and seeps were delineated at a desktop level within the site
Agricultural potential	Site X is dominated by Fa soil type. Hb and Dc are also found on site.
Avifauna	The Dudley Pringle Dam, a natural lake, is a prominent feature within the area which is reported to support a diversity of bird species. The natural avifaunal habitats are under significant pressure in terms of fragmentation, transformation and permanent loss as a result agricultural and urban activities occurring in the area at present.
Flora and Fauna (Biodiversity)	Located within a transformed environment where impacts on biodiversity would be low and no significant impacts on terrestrial ecosystems can be expected. All four alternatives are considered acceptable and there is not clear preferred alternative.

7.1.3.3 Substation Site Alternative X3

This is the most eastern substation alternative site. The area is used for the cultivation of sugarcane, and is in close proximity to infrastructural development including the R102 road, local roads and a railway track.

Table 11: Summary of Specialist Findings-Site Alternative X3

Specialist	Description
Heritage	Similar to Site B, Site X3 is located on an area which is farmed throughout and fairly undulating, these areas are also characterised by industrial buildings on the southern section.
Wetland	The delineated wetland and drainage channels are widely spaced, with a number of areas available for the development of the substation. With reference to the wetland specialist report, this is the preferred alternative due to its positioning and low number of wetlands identified at the desktop level.

Agricultural potential	Site X3 is characterised by a large proportion of Ea soils (dark clay soils) and Dc (duplex soils), which have a heavier texture and may be more erodible if the topsoil is exposed.
Avifauna	Site X3 is located closer to the airport and is likely to be within the impact zone for this facility and as a result likely to provide less favourable conditions for some of the more sensitive species.
Flora (Biodiversity)	Irreplaceable CBAs occur in small patches associated with remnant indigenous vegetation of the sites including at Site X3 has a large artificial wetland within its buffer. However, in general, the substation site is within highly transformed environments and can be positioned to avoid any impact to important biodiversity features.

7.1.4 CORRIDOR ALTERNATIVES OF THE PROPOSED POWERLINES

Three corridor alternatives for the proposed 2x400kV Inyaninga-Mbewu powerlines are considered. The final route will be dependent on the outcomes of the environmental assessment, specialist recommendations and taking into account the comments from I&APs. Table 12 below shows the start, middle and end coordinates and lengths of the corridors. Further

Table 12: Corridor Coordinates

	Latitude	Longitude	Length of route within Corridor
Corridor 1			
Start	28°42'21.33"S	31°45'50.16"E	147km (main route) + 8.5km (fork to the south) + 7km (fork to the south-east)
Middle	29°10'48.96"S	31°20'40.90"E	
End	29°36'34.28"S	31° 5'13.76"E	
Corridor 2			
Start	28°42'21.33"S	31°45'50.16"E	147km (main route) + 30.8km (fork to the east which joins the main route)
Middle	29°10'56.43"S	31°25'6.98"E	
End	29°32'9.00"S	31° 6'28.62"E	
Corridor 3			
Start	28°42'21.33"S	31°45'50.16"E	158km (main route)
Middle	28°52'2.70"S	31°37'8.34"E	
End	29° 4'16.46"S	31°23'26.77"E	

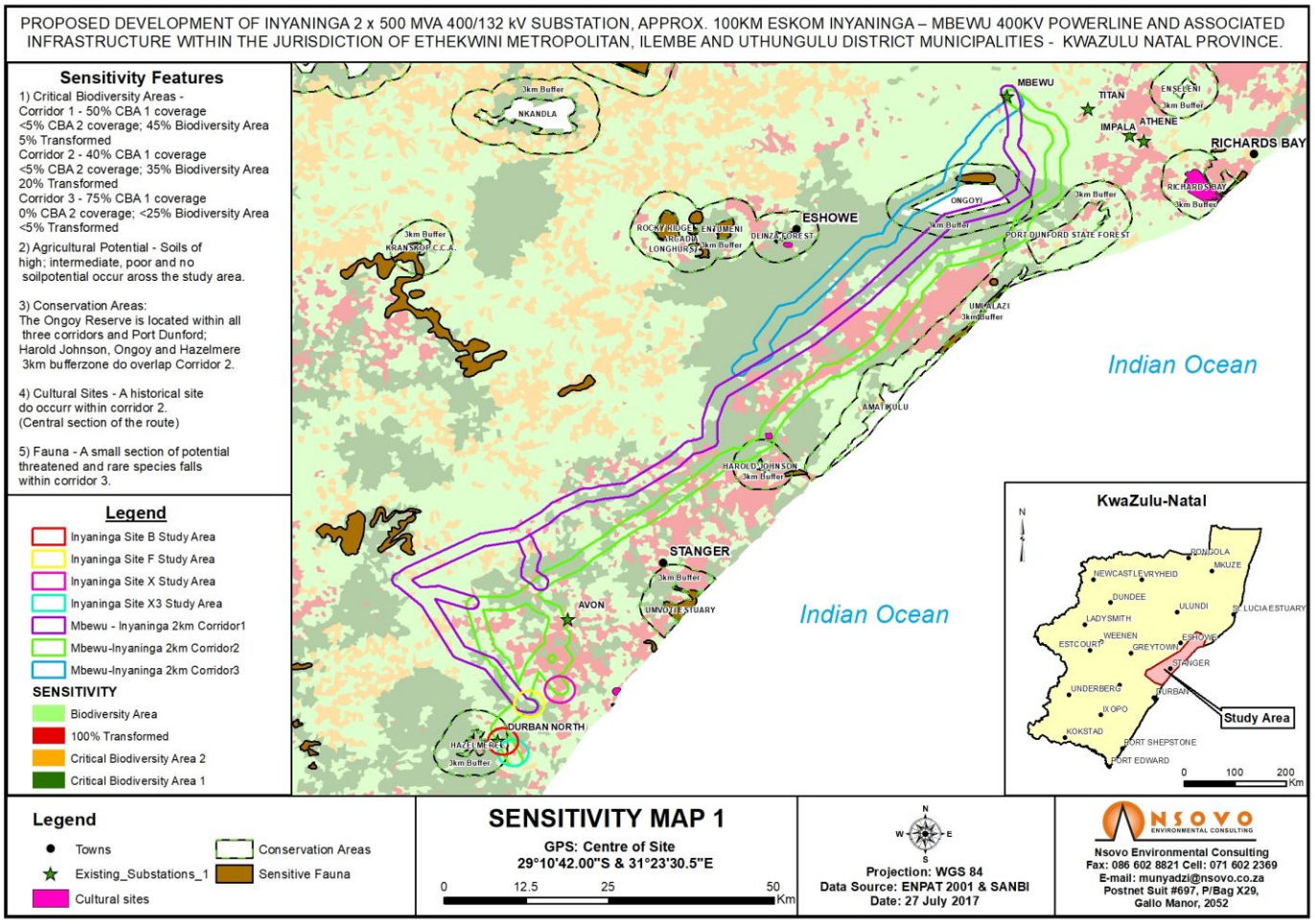

Figure 9: Sensitive areas along the Alignment of the 3 Corridors

7.1.4.1 Alternative Corridor 1

Corridor 1 is 2km wide stretches over 147km. The corridor starts at the planned Mbewu substation in Empangeni close to the R34 towards a southerly direction. It turns in a westerly direction through Ongoyi forest and turns southward passing through rural settlements. The corridor turns at Nsuze village in a south easterly direction toward Durban North for an additional 7km to loop into the proposed new Inyaninga Substation. The corridor has an option of turning at Shakas kraal near the existing Avon substation in a southerly direction for an additional 8.5km to join Alternative 2 which then continues into the substation alternatives.

The corridor has approximately 16 bends and it crosses river sensitive zones approximately 14 times. It crosses Class A, B and C rivers and further encroaches on the Tugela, Mfolozi and Nkomazi catchments as well as natural and artificial wetlands including FEPA Rivers. Further the corridor stretches a distance of approximately 18km across the Ongoyi conservation area.

7.1.4.2 Alternative Corridor 2

Corridor 2 is a 2km corridor which stretched over 147km. Similar to Corridor 1; this corridor starts at Mbewu substation in Empangeni close to the R34 towards a southerly direction. It turns in a westerly direction along the R102 and encroaches slightly on the Ongoyi forest, Port Dunford, Harold Johnson as well as Hazelmere conservation areas as it enters substation alternatives X and X3. The corridor follows the existing 275kV Impala-Durban North powerline. The corridor has an option of turning at Shakas kraal near the existing Avon substation in a southerly direction for an additional 30.8km which then continues into the substation alternatives. The corridor traverses sugar cane farms as well as rural settlements.

The corridor has approximately 18 bends and it crosses river sensitive zones approximately 14 times. It crosses Class A, B and C rivers and further encroaches on the Tugela, Mfolozi and Nkomazi catchments as well as natural and artificial wetlands including FEPA Rivers.

7.1.4.3 Alternative corridor 3

Alternative Corridor 3 is the Northern most corridor which stretches over 58km before it joins and continues as corridor 1. The corridor starts at Mbewu substation in Empangeni close to the R34 towards a south westerly direction. It spans through the Ongoyi forest for approximately 18km and continues in the same direction passing through rural settlements. This corridor has high percentage of residential property therefore it is presumed that it has high potential of graves. This corridor alternative is predominantly in the northern portion of the proposed study area ending near Isithebe. This corridor will then follow the same route as corridor 1 southwards to the proposed Inyaninga substation.

The corridor has the least bends and it crosses river sensitive zones approximately 14 times. Similar to Corridor 1 and 2 it crosses Class A, B and C rivers and further encroaches on the Tugela, Mfolozi and Mkomazi catchments as well as natural and artificial wetlands including FEPA rivers . Further the corridor the Ongoyi conservation area for approximately 15km. Table 13 summarises the corridor alternatives from specialist perspective.

Table 13: Summary of Specialist Findings: Corridor Alternatives

Specialist	Description of the corridor alternatives		
	Corridor 1	**Corridor 2**	**Corridor 3**
Eco-tourism	This corridor is expected to have significant direct impacts on the Ongoye Forest Node. This may have negative repercussions on ecotourism products such as the Ongoye Birders Camp, which benefits from the pristine condition of the south east portion of the Ongoye Forest Reserve.	In the northern portion this corridor is not expected to have direct impacts on any of the identified tourism nodes. There is an existing HV power-lines running through the reserve already, and the cumulative impact of additional lines is be deemed insignificant.	This is predominantly in the northern portion of the proposed site. Would impact the Ongoye Ezemvelo KZN Wildlife Lodge Development Area. The disturbance to the forest from the construction phase of the development would be long-term and may compromise the economic feasibility of ecotourism initiatives around the Ongoye Node.
Aquatic ecology	The proposed corridor crosses FEPA rivers.	It is recommended that in terms of the scope of this report that corridor two is the preferred option when considering the risk profile presented to the aquatic ecosystems, as is encounters fewer FEPA rivers and passes over more disturbed land than the other two route options.	In terms of the scope of this report it was found out that corridor three is the least preferred option when considering the risk profile presented to the aquatic ecosystems, as it run into more NFEPA rivers and passes over more undisturbed land than the corridor Two. Further, Corridor 3 borders on two upstream management areas.
Wetland	Due to the broad scale nature of the project and the desktop approach any of the three proposed corridors **(i.e. including alternative corridor 1)** can be utilized from wetland perspective.	Due to the broad scale nature of the project and the desktop approach any of the three proposed corridors **(i.e. more preferably alternative corridor 2)** can be utilized from wetland perspective.	Due to the broad scale nature of the project and the desktop approach any of the three proposed corridors **(i.e. including alternative corridor 3)** can be utilized from wetland perspective

Specialist	Description of the corridor alternatives		
	Corridor 1	**Corridor 2**	**Corridor 3**
Agricultural potential	From the agricultural perspective, this corridor crosses the largest area with **high** potential soils within the proposed area.	From the agricultural perspective, this corridor crosses the largest area with **low** potential soils within the proposed area;	From the agricultural perspective, this corridor crosses the largest area with **high** potential soils within the proposed area.
Avifauna	Increased collisions of Red List avifauna can be expected along this alignment Furthermore, resulting in a negative direct mortality impacts (i.e. particularly large terrestrial, water birds and to a lesser extent raptors).	Corridor 2 will reduce collisions of Red List avifauna can be expected along this alignment. Furthermore, resulting in a low negative direct mortality impacts (i.e. particularly large terrestrial, water birds and to a lesser extent raptors).	Similarly with corridor 1, corridor 3 increased the collisions of Red List avifauna can be expected along this alignment. Furthermore, resulting in a negative direct mortality impacts (i.e. particularly large terrestrial, water birds and to a lesser extent raptors).
Flora (Biodiversity)	This corridor traverses several large tracts of sensitive habitat including rugged grassland and the Ongoye Forest. Due to the presence of these sensitive habitats, it is not considered to be a preferred alternative and would generate significantly high impacts.	This corridor alternative contains the highest proportion of transformed habitat and least extensive areas of intact contiguous habitat. As a result it is likely that the power line can be routed most remaining areas of intact habitat and impacts would be the lowest of the three alternatives.	The corridor alternative 3 traverses several critical habitats of national significance and is considered a fatal flaw and not a viable alternative.

7.1.5 NO-GO ALTERNATIVE

In accordance with GN R.326, consideration must be given to the option not to act. This option is usually considered when the proposed development is envisaged to have significant negative environmental impacts that mitigation measures cannot ameliorate the identified impacts effectively. The no-go alternative would be the option of not undertaking the development of the proposed project. It would imply that the current electricity supply network is not strengthened, industrial development in the area will be hindered and the integration of potential renewable energy in the area will not be possible. Should the no-go alternative be adopted, the KwaZulu-Natal grid will be deprived of a much needed essential service, particularly given the already existing energy supply challenge countrywide.

7.2 PUBLIC PARTICIPATION PROCESS

The EIA Regulations require that during a Scoping and EIA process, the organs of State together with Interested and Affected Parties (I&APs) and the general public be informed of the application for Environmental Authorisation (EA) and also be afforded an opportunity to comment on the application.

Public Participation Process (PPP) is any process that involves the public in problem solving and decision-making and it forms an integral part of the Scoping and EIA process. The PPP provides people who may be interested in or affected by the proposed development, with an opportunity to provide comments and to raise issues or concern, or to make suggestions that may result in enhanced benefits for the project.

Chapter 6, regulation 39 through 44, of the EIA Regulations stipulates the manner in which the PPP should be conducted as well as the minimum requirements for a compliant process. These requirements include (but not limited to):

(a) Fixing a notice board at a place conspicuous to the public at the boundary or on the fence of—

(i) The site where the activity to which the application relates is or is to be undertaken;

(b) Giving written notice to—

(i) The occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;

(ii) the owners or persons in control of that land occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;

(iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of rate payers that represent the community in the area;

(iv) The municipality which has jurisdiction in the area;

(v) any organ of state having jurisdiction in respect of any aspect of the activity; and

(vi) Any other party as required by the competent authority;

(c) Placing an advertisement in—

(i) One local Newspaper

The primary purpose of this section of the report is as follows:

To outline the PPP that was undertaken;

To synthesise the comments and issues raised by the key stakeholders, Interested and Affect Parties; and

To ensure that the EIA process fully address the issues and concerns raised, if any.

7.2.1 PUBLIC PARTICIPATION PRINCIPLES

The principle of the Public Participation holds that those who are affected by a decision have the right to be involved in the decision-making process (i.e. the public's contribution will influence the decision). One of the primary objectives of conducting the PPP is to provide interested and affected parties with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- Is as inclusive and transparent as possible, it must be conducted in line with the requirements of regulation 39 - 44 of the EIA Regulations.

7.2.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process is in line with the processes contemplated in regulation 39 - 44 of the EIA Regulations of, in terms of NEMA, which provides that:

7.2.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders including government department, landowners and the general public. Notification and request for comments were submitted to the following key stakeholders:

- eThekwini Metropolitan Municipality;
- South African Heritage Resource Agency;

- KwaZulul Natal Department of Transport and Public Works;
- KwaZulu-Natal Department of Water and Sanitation;
- Wildlife and Environmental Society of South Africa;
- KwaZulu-Natal Department Economic Development, Tourism and Environmental Affairs;
- National Department of Environmental Affairs; and
- National Department of Water and Sanitation.

The notifications were sent by registered mail; refer to **Appendix D3**

7.2.4 PUBLIC PARTICIPATION DATABASE

In accordance with the requirements of the EIA Regulations under Section (24) 5 of NEMA, regulation 42 of GN R. 982, a Register of I&APs must be kept by the Public Participation Practitioner. In fulfilment of this requirement, such a register is compiled and details of the I&APs including their comments will be updated throughout the project cycle. The I&AP database is attached as **Appendix D5.**

7.2.5 SITE NOTICES

On the 9th of June 2015, A2 size notices were fixed at various conspicuous locations within and around the proposed project study area, Mbewu substation as well as at the Alternative site B, F, X and X3 along R102. Photographic evidence of the site notices is attached as **Appendix D1.**

7.2.6 DISTRIBUTION OF NOTICES TO SURROUNDING LAND OWNERS/ OCCUPIERS

Notification letters were posted via registered mail to stakeholders on the 01st December 2016 (Refer to **Appendix D3** for proof of postage), whereas site notices were hand delivered to landowners/occupiers from the 22nd to the 25th November 2016. These notifications were informing government stakeholders and the public of the project as well as afford them an opportunity (30 days as per the EIA Regulations) to register as I&AP and also to comment on the project.

7.2.7 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement was placed on the Daily News on the 11th November 2016. The advertisement was aimed at further informing the I&APs of the proposed activity. A 30 day period was allowed for the public to submit their comments, issues and concerns. Proof of newspaper advertisement is attached as **Appendix D2.**

7.2.8 PLACEMENT OF DRAFT SCOPING REPORT FOR COMMENTS

The availability of the draft Scoping report will be advertised on local newspaper and a copy of the report will be published on the Nsovo website. Further, copies of the draft Scoping report will be submitted to various departments for review and comment, these include the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs, Department of Water Affairs and eThekwini Metropolitan Municipality.

7.2.9 PUBLIC MEETINGS

Public and focus group meetings will be scheduled accordingly during the EIA phase to address and iron out all issues and comments raised during the scoping phase.

7.3 A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Appendix D4 contains the comments, issues and concerns raised together with the responses provided by the EAP.

7.4 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

This section outlines those parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description in Section 4, and knowledge of the existing environment, potential interactions between the project and the environment are identified in the next section. The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included. Below is the description of the receiving environment.

7.4.1 SOCIO-ECONOMIC DESCRIPTION

This section presents the socio-economic aspects of the proposed area focusing on the province, metropolitan and district municipalities within which the project falls under.

7.4.1.1 Provincial Description

The proposed project is within the KwaZulu-Natal province which is located in the south-east of South Africa, along the Indian Ocean. It borders the Eastern Cape, Free State and Mpumalanga provinces of South Africa as well as neighbouring countries namely: Lesotho, Swaziland and Mozambique. As highlighted in the IDP, the province stretches from the lush subtropical east coast washed by the warm Indian Ocean, to the sweeping savannah in the east and the majestic Drakensberg Mountain Range in the west.

The KwaZulu-Natal province covers an area of 94 361km² and is the third-smallest in South Africa. It has a population of 11 065 240, making it the second most heavily populated province in the country of South Africa. The capital is Pietermaritzburg while the largest city is Durban. Other major cities and towns include Richards Bay, Port Shepstone, Newcastle, Estcourt, Ladysmith and Richmond.

The province's manufacturing sector is the largest in terms of contribution to GDP. Richards Bay is the centre of operations for South Africa's aluminium industry. The Richards Bay Coal Terminal is instrumental in securing the country's position as the second-largest exporter of steam coal in the world. The province has undergone rapid industrialisation owing to its abundant water supply and labour resources.

Agriculture is also central to the economy. The sugar cane plantations along the coastal belt are the mainstay of KwaZulu-Natal's agriculture. The coastal belt is also a large producer of subtropical fruit, while the farmers inland concentrate on vegetable, dairy and stock farming. Another source of income is forestry in the areas around Vryheid, Eshowe, Richmond, Harding and Ngome. KwaZulu-Natal comprises of eThekwini Metropolitan Municipality, 10 district municipalities and 43 local municipalities. See Figure 10 below.

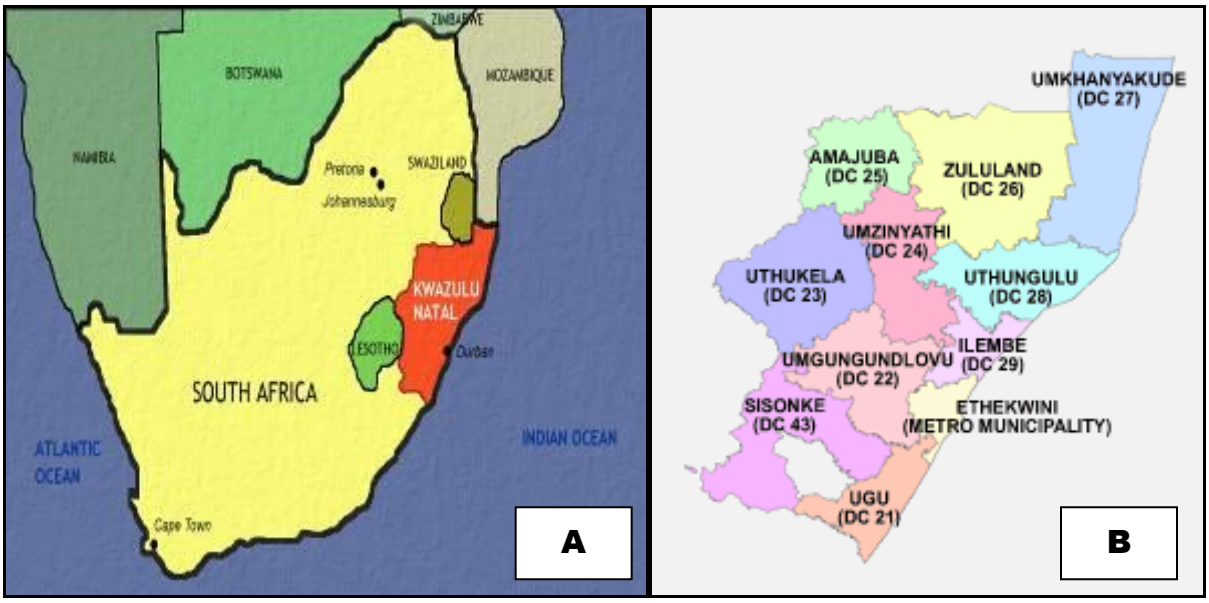

Figure 10: Photograph A shows the province of KwaZulu-Natal within South Africa. Photograph B shows eThekwini Metropolitan Municipality and other district municipalities. (Source: www.odm.org.za)

7.4.1.2 EThekwini Metropolitan Municipality

EThekwini Metropolitan Municipality is a Category "A" municipality situated within the KwaZulu-Natal province in South Africa. EThekwini is the largest city of the KwaZulu-Natal province and the third-largest city South Africa. It is 229 193ha in extent, bounded by the Tongati River in the north, the aMahlongwa River in the south and the Indian Ocean to the east. The western, landward boundary is narrowest at both the northern and southern limits becoming progressively wider toward the vicinity of Cato Ridge, where it is at its broadest, approximately 50 km inland. This Municipality has land area which is comparatively larger than other South African cities. Geographically, eThekwini is topographically hilly, with many gorges and ravines and almost no true coastal plain.

According to the 2016 and 2011 census eThekwini has a population of 3 702 231 in 1 125 767 households. Of this population, 73.80% are "Black African", 16.66% "Indian/Asian", 6.64% "white" and 2.5% coloured and 0.14%. The first language of 62.82% of the population is isiZulu, while 26.77% speak English and 3.91% speak isiXhosa.

eThekwini is a sophisticated, cosmopolitan city which consist of ten districts namely; Amabuja, Harry Gwala, iLembe, Ugu, King Cetshwayo, uMgungundlovu, uMkhanyakude, uMzunyathi, uThukela and Zululand districts; and is surrounded by four districts which are: iLembe to the north, the Indian Ocean to the east, Ugu to the south and lastly, UMgungundlovu to the west. The population of the municipal area is relatively young with 73.6% of the population being younger than 39 years of age while the gender division for the area is 48.87% male and 51.13% female.

This Municipality is a major centre of tourism because of the City's warm, subtropical climate and extensive beaches. There is emphasis on ecotourism and cultural heritage tourism activities within the Municipality. EThekwini tourism is the leading domestic destination in South Africa with estimated visitor number averaging 9, 95 million per year. Subsequently, the value of the domestic tourism economic impact on the region's GDP is estimated to be 8% per annum. The hospitality industry consists of fine hotels, nightspots, shopping malls, ethnic attractions, traditional villages, craft markets, sparkling dams and game parks.

The main economic sectors are finance (22%) and manufacturing (22%), followed by the community services (18%), trade and transport (16%) while 3% and 2% are for construction and electricity respectively (IDP, 2017).

7.4.1.3 ILembe and uThungulu Districts Municipality

ILembe and uThungulu Districts are Category C municipalities. UThungulu is located in the north-eastern region of the KwaZulu-Natal while iLembe is situated on the east coast, bordering the Indian Ocean (Figure 11). ILembe covers an area of approximately 3 260km² and while uThungulu is approximately 8 213km². UThungulu consists of five local municipalities: City of uMhlathuze, uMlalazi, Mthonjaneni, Nkandla and uMfolozi (previously Mbonambi). In addition, it covers the area from KwaGingindlovu (previously Gingindlovu) in the south, to the UMfolozi River in the north, and inland to Nkandla. ILembe consists of four local municipalities located between eThekwini and Richards Bay: Mandeni, KwaDukuza, Maphumulo and Ndwedwe.

UThungulu has the third-highest population in the province while iLembe is the smallest of the province's district municipalities, making up a mere 3% of its geographical area. The N3 highway links both districts to other significant economic centres such as eThekwini and Johannesburg in the Gauteng Province. It also offers a direct route to Maputo in Mozambique. The development of the Richards Bay Industrial Development Zone is boosting economic activity and attracting international investors within both districts. The main economic sectors within uThungulu entail the following: manufacturing (40.9%), mining (15.2%), community services (11.9%), finance (8.7%), transport (8.5%), trade (6.5%), agriculture (5.3%), and construction (2.1%).

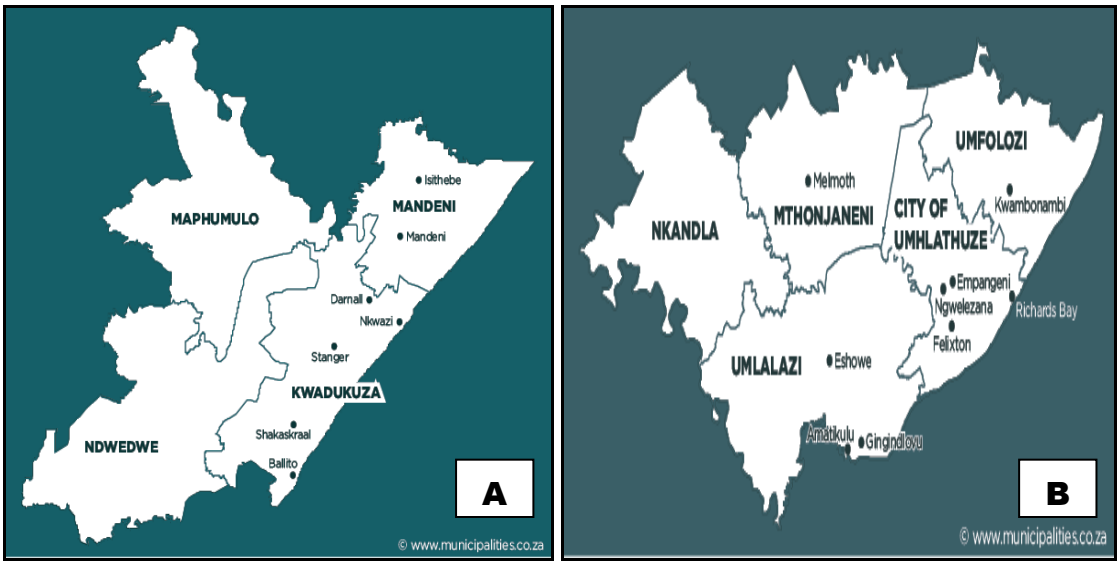

Figure 11: Photograph shows the map of iLembe District Municipality while photograph B shows uThungulu District Municipality.

7.4.2 CLIMATIC CONDITION OF THE PROPOSED AREA

Generally, the climate of the eThekwini is subtropical with humid and warm summers and mild winters. Temperatures are generally warmest at the coast and get progressively cooler as one move inland. Temperature seasonality (i.e. the degree to which average temperatures change between seasons) is greatest in two regions: in the outer west (largely related to altitude), and at the central and northern coastal region. Rainfall is generally more abundant in the south and at the coast. There is strong seasonality in rainfall in the outer west regions with most of the rain falling in the summer months. The predominant winds blow parallel to the coastline in a north-easterly and south-westerly direction and frost is limited to a few days in inland, high altitude, areas.

The eThekwini area is characterised by a summer rainfall pattern with sporadic rainfall events in the winter months. The temperatures all year round range from 16 °C to 25°C in winter and 23°C to 33°C in summer. The wettest time of the year is January with and the driest is June. The seasonality of precipitation is a driving factor behind the hydrological cycles of rivers, wetlands and drainage lines within the area. Typically, these water resources have a higher flow rate during the summer months.

7.4.3 GEOLOGY

The geology of the KwaZulu-Natal Coastal belt from Durban northwards to Mozambique generally consists of beach-derived Aeolian sands which cover most of Maputaland and which are underlain by calcareous sediments of marine origin (Figure, 12). This coastal plain is widest in Maputaland at approximately 75km wide and narrows in the vicinity

of Mtunzini; where after it is a narrow strip down the north and south coasts of KZN (Camp, 1999). Further to this, parts of the corridor alternatives are situated within areas characterised by sediments of the Karoo Super group rocks with the mudstones and lesser sandstones of the Adelaide and Tarkastad Subgroups (Beaufort Group) comprising the dominant formations. A variety of soil forms are supported by these geological features. Shallow soils are common over the harder older sandstones, while younger soils dominate the coastal belt. Alluvial soils are also located within the watercourses. The geological map below depicts the geological classes traversed by the proposed corridors.

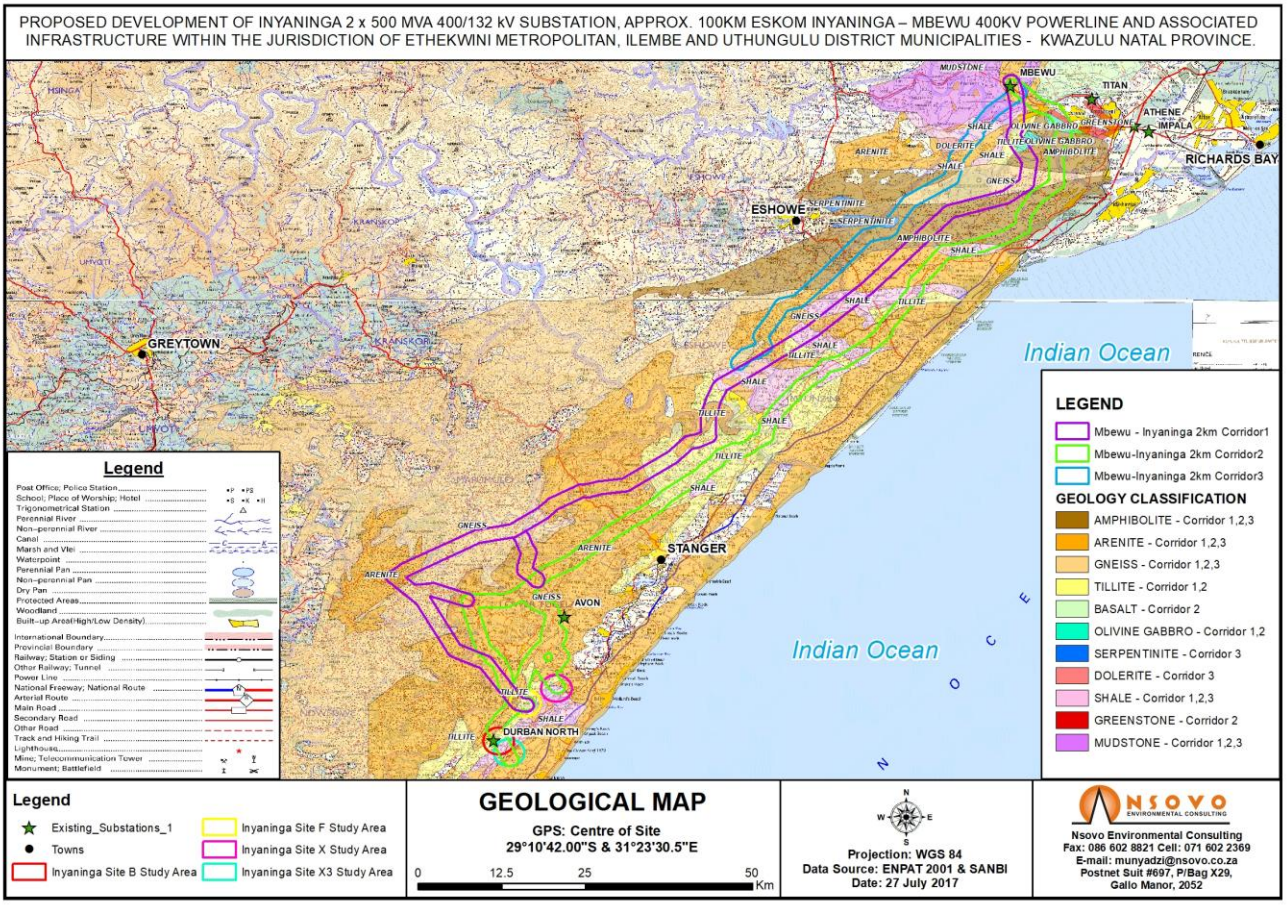

Figure 12: Geological Map

7.4.4 TOPOGRAPHY

The main topographical unit within the proposed area consists of moderately undulating plains and ridgelines with rolling hills which are characteristic of the study area. The landscape is characterised by rolling terrain with the Drakensberg escarpment forming the main topographical feature (National Water Resource Strategy, 2004). These topographical units often give rise to wetlands and watercourse systems.

7.4.5 HYDROLOGY

Corridors 1 and 2 traverse the Tugela, Mfolozi and Mkomazi Rivers, while Corridor 3 traverses only the Mfolozi River. Further, several artificial and natural wetlands are found along the alignments. Figure 13 depicts the hydrological within the study area.

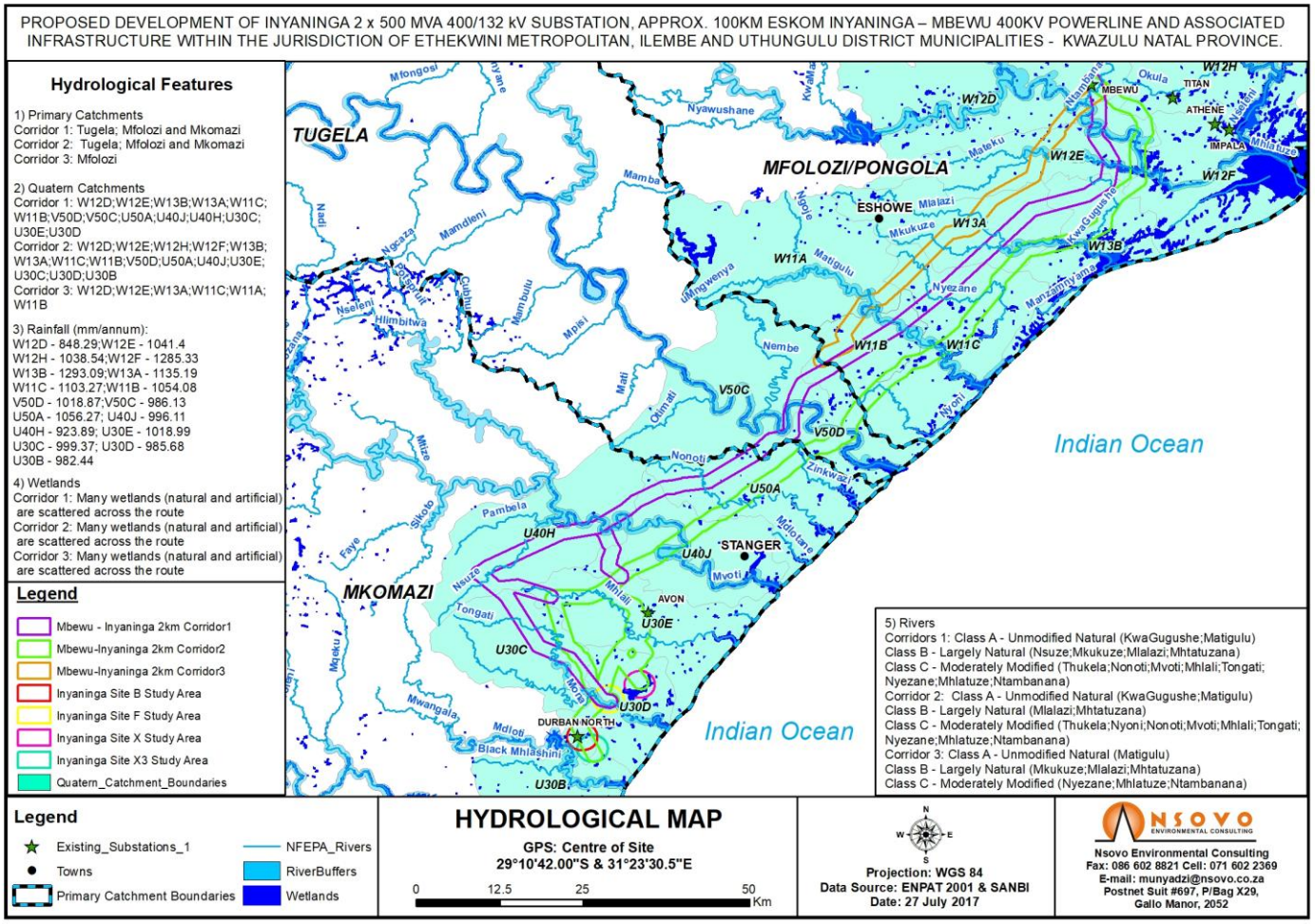

Figure 13: Hydrological map

The corridor alternatives are located within the following quaternary catchments **(Table 14):**

Table 14: The quaternary catchments located within the Corridors

The quaternary catchments			
W12D	W13A	V50A	U40J
W12E	W13B	V50C	U40H
W12H	W11B	V50D	U30B
W12F	W11C	-	U30C

These quaternary catchments are located within three Water Management Areas (WMA), namely, Usutu to Mhlathuze, Mvoti, Umzimkhulu and the Thukela. The Mvoti to Umzimkulu WMA lies along the South Africa's eastern coast, primarily within KwaZulu-Natal. The Mvoti to Umzimkulu WMA is comprised of a diverse economic sector with forestry, agriculture (both subsistence and commercial) and eco-tourism forming the primary land use activities.

The Thukela WMA consists of the entire catchment of the Thukela River. The Thukela River rises in the Drakensberg Mountains very close to the border with Lesotho and meanders through central KwaZulu-Natal and discharges into the Indian Ocean. The Upper Thukela lies in the upper reaches of the Thukela River, upstream of the confluence with the Bushmans River, and includes the towns of Bergville, Ladysmith, Colenso and Weenen (DWAF, 2004). Usutu to Mhlathuze WMA originates in the Drakensberg Mountain range and runs in a predominantly easterly direction draining 4209 km^2 of land before finally discharging into the Indian Ocean at Richards Bay (DWAF, 2004).

The three powerline corridor alternatives traverse the North Eastern Coastal Belt Eco-region, the North Eastern Uplands Eco-region and the Natal Coastal Plain Eco-region as depicted below.

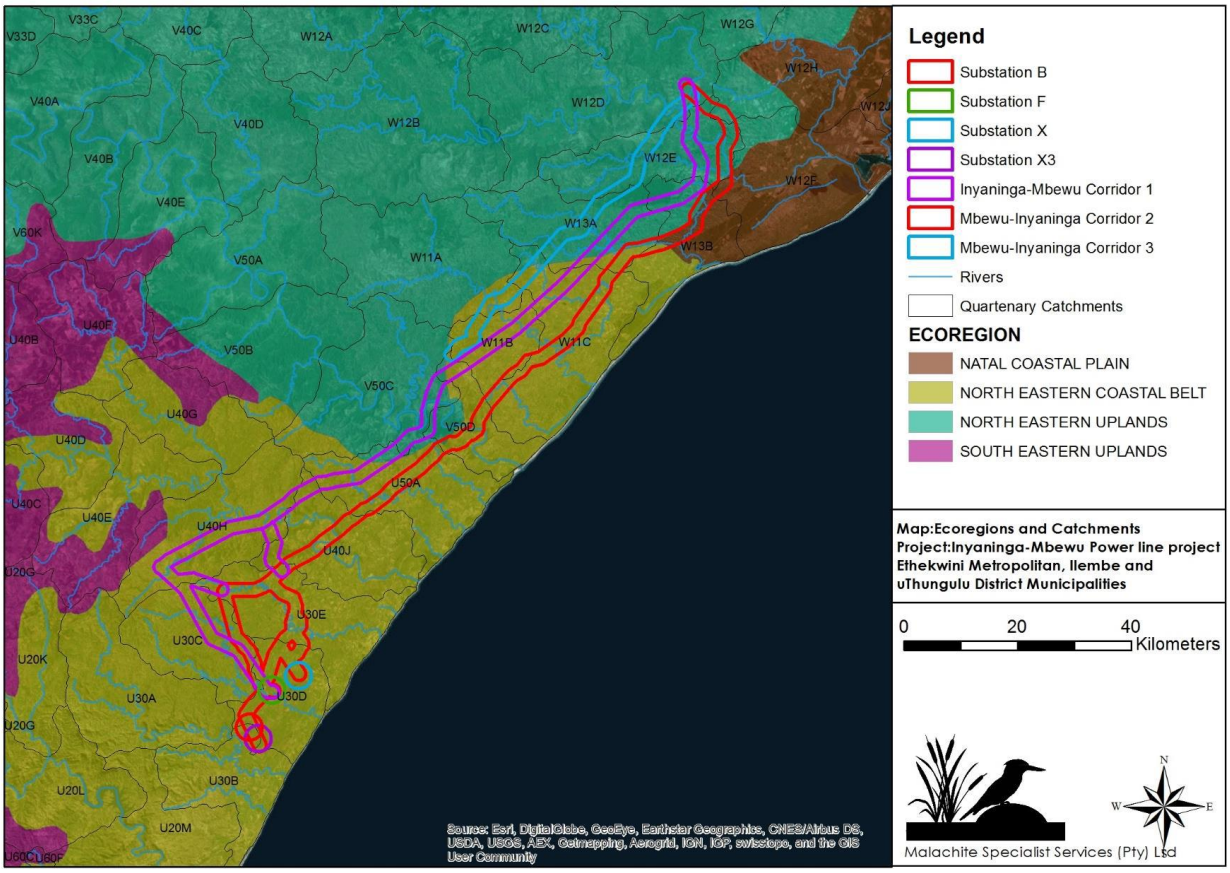

Figure 14: Eco-regions of South Africa (DWAF, 2005)

7.4.6 AIR QUALITY AND POLLUTION

Air quality is defined to include noise and odour and addresses all sources of air pollution (i.e. point, area and mobile sources). The Municipality Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004 and more specifically, to provide guidance on Air Quality Management in eThekwini. The Plan identifies air pollution sources in the proposed locations as follows:

- Smoke from fire used for sugarcane harvesting (See Figure 9).
- Clay brick manufacturing;
- Agricultural activities such as spraying;
- Agricultural activities such as sugarcane;
- Biomass burning (veld fires);
- Domestic fuel burning (wood and paraffin);
- Vehicle emissions;
- Waste treatment and disposal;
- Dust from infrastructural development;

- Dust from unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas

There are few sources of air pollutants in eThekwini and even fewer within the immediate proposed area. The ambient air quality is generally good; however, emissions from industrial boilers are likely to result in local areas of elevated concentrations of air pollutants. Ambient particulate concentrations are likely to be high in low – income residential areas where wood is used as primary fuel source. The motor vehicle congestion in holiday towns and along the N3 road results in elevated ambient concentrations of particulates and Nitrogen Oxides (NO_2) at times.

7.4.7 VEGETATION STRUCTURE AND COMPOSITION

The study area is located within a wide variety of vegetation types within the Azonal Vegetation, Grassland, Forests, Indian Ocean Coastal Belt and Savannah Biomes (Mucina and Rutherford, 2006). The powerline will traverse through thirteen vegetation units (Figure 15 and 16) with the KwaZulu-Natal Coastal Belt Grassland being the most dominant vegetation type. The southern portion of the study area also passes through Eastern Valley Bushveld, while the northern sections pass through Zululand Coastal Thornveld. Patches of Scarp Forests are also present throughout the proposed corridors.

The KwaZulu-Natal Coastal Belt Grassland vegetation type is characterised by highly dissecting, undulating coastal plains and is comprised mainly of a mosaic of sugarcane fields, timber plantations, thickets, coastal thornveld and secondary *Aristida* grasslands. This topography supports natural, species rich grasslands punctuated with low shrub species and rocky outcrops. This vegetation type is considered endangered (Mucina and Rutherford, 2006). It is predicted that more than 50% of this vegetation type has been transformed due to cultivation, urban expansion and the development of road networks. Further to this alien invasive species including *Chromolaena odorata*, *Lantana camara*, *Melia azedarach* and *Solanum mauritianum* are common and have a detrimental impact on remaining patches of this coast vegetation.

The Eastern Valley Bushveld vegetation type dominates the lower Thukela River basin and is characterised by a mosaic of semidecidous savannah woodlands and thickets with steep mountainous topography, incised by the Thukela River. The majority of the river valleys within this vegetation type drain along the northwest-southwest axis. This results in an unequal distribution of rainfall, with the steep north facing slopes receiving less rain and subsequently increased xerophilous conditions along these slopes. The vegetation composition is dominated by *Euphorbia, Acacia* and *Aloe* species and this vegetation type is considered least threatened (Mucina and Rutherford, 2006).

Zululand Coastal Thornveld is located to the west of Mtubatuba in gentle rolling landscapes supporting wooded grassland dominated by *Themeda triandra*. Bush clumps are a common feature and are more numerous on deeper soils with *Phoenix reclinata* and *Gymnosporia senegalensis* dominant. This vegetation type is considered Endangered (Mucina and Rutherford, 2006).

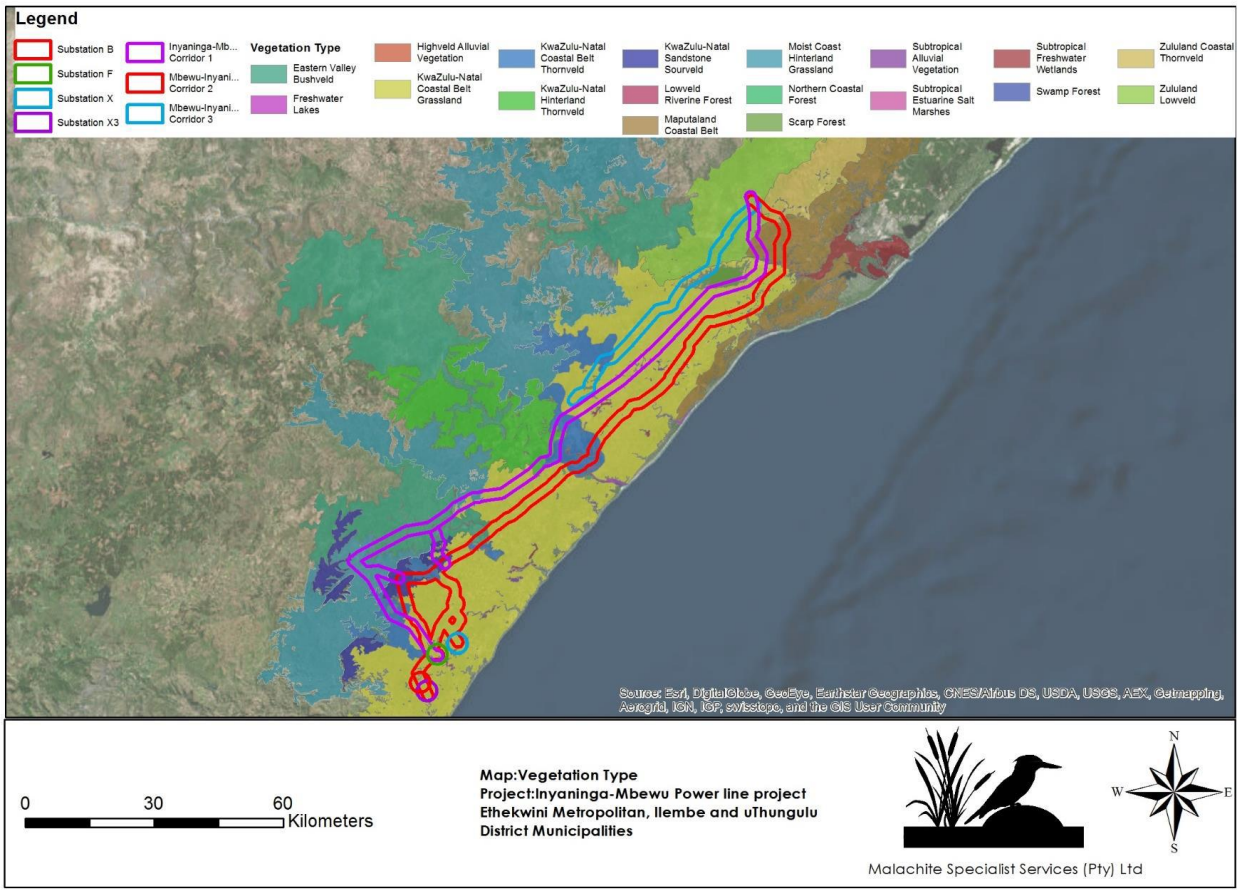

Figure 15: Vegetation types associated with the proposed area

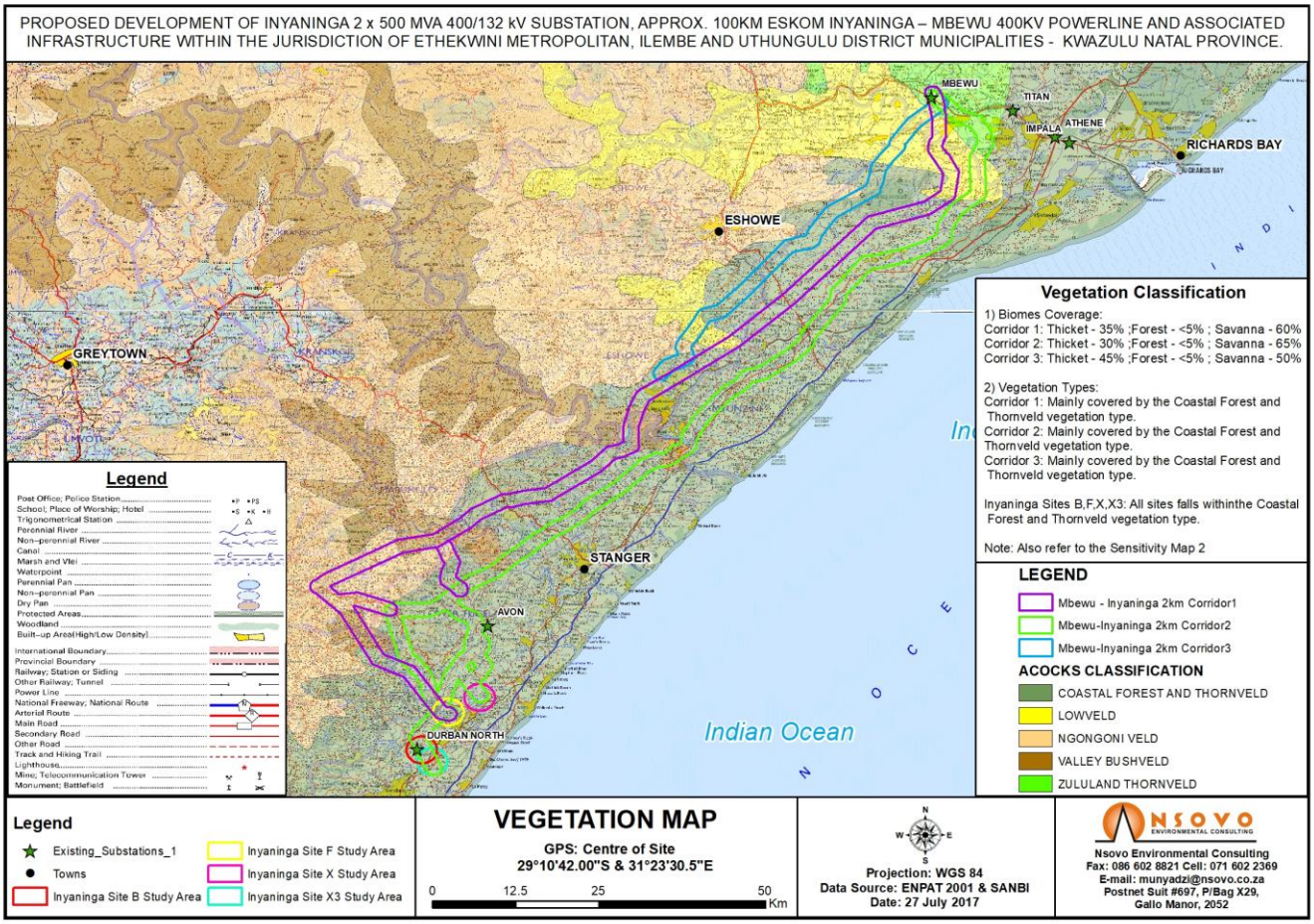

Figure 16: The Vegetation within the proposed study area

7.4.7.1 Listed and Protected Species

Based on the specialist report the SANBI SIBIS database, more than 2900 indigenous species have been recorded from the nine quarter degree squares distributed along the power line corridors. This includes 34 species of high conservation concern and an additional 41 of moderate conservation concern. Given the highly fragmented nature of the vegetation along the routes, it is clear that impact can be minimized through avoiding impact to remnant vegetation or forest patches along the routes. The primary determinant of ecological impact associated with the different power line route alternatives is their impact on indigenous vegetation and sensitive habitats and the route with the lowest likely impact on listed intact and sensitive vegetation communities would be the preferred option.

Table 12: Numbers of the species within the different conservation status categories as indicated below, for each Quarter Degree Square (QDS) across the site; data derived from the SANBI SIBIS database.

Threat Status	Quarter Degree Square									Total
	2831DB	2831DC	2831DD	2930BD	2931AB	2931AC	2931AD	2931BA	2931CA	
CR		1								**1**
CR PE									1	**1**
EN		1	1	3			1			**5**
VU		9	6	8	1	2	1			**25**
Threatened		1	1							**2**
NT	1	5	4	3	1				2	**14**
Rare		1	1							**2**
Declining		7	7			1	3	1	6	**25**
DDD		1								**1**
DDT		2	1		1		4	2		**10**
LC	168	649	577	223	197	102	316	135	450	**2817**
Not Evaluated	1	9	11	1	4	2	4	3	6	**41**
TOTAL	**170**	**686**	**609**	**238**	**204**	**107**	**329**	**141**	**465**	**2949**

7.4.7.2 Critical Biodiversity Area (CBA)

The KwaZulu-Natal (2016) CBA map for the general area surrounding the substation sites is depicted in Figure 17 below. Irreplaceable CBAs occur in small patches associated with remnant indigenous vegetation in three of the substation sites: B, X3 and F (substation F to a greater extent than the latter two sites). Substation F has the Tongati River and a small Priority 1 NFEPA wetland located within its broader area. Substation X3 has a large artificial wetland within its buffer. However, in general, the substation sites are within highly transformed environments and can be positioned to avoid any impact to important biodiversity features.

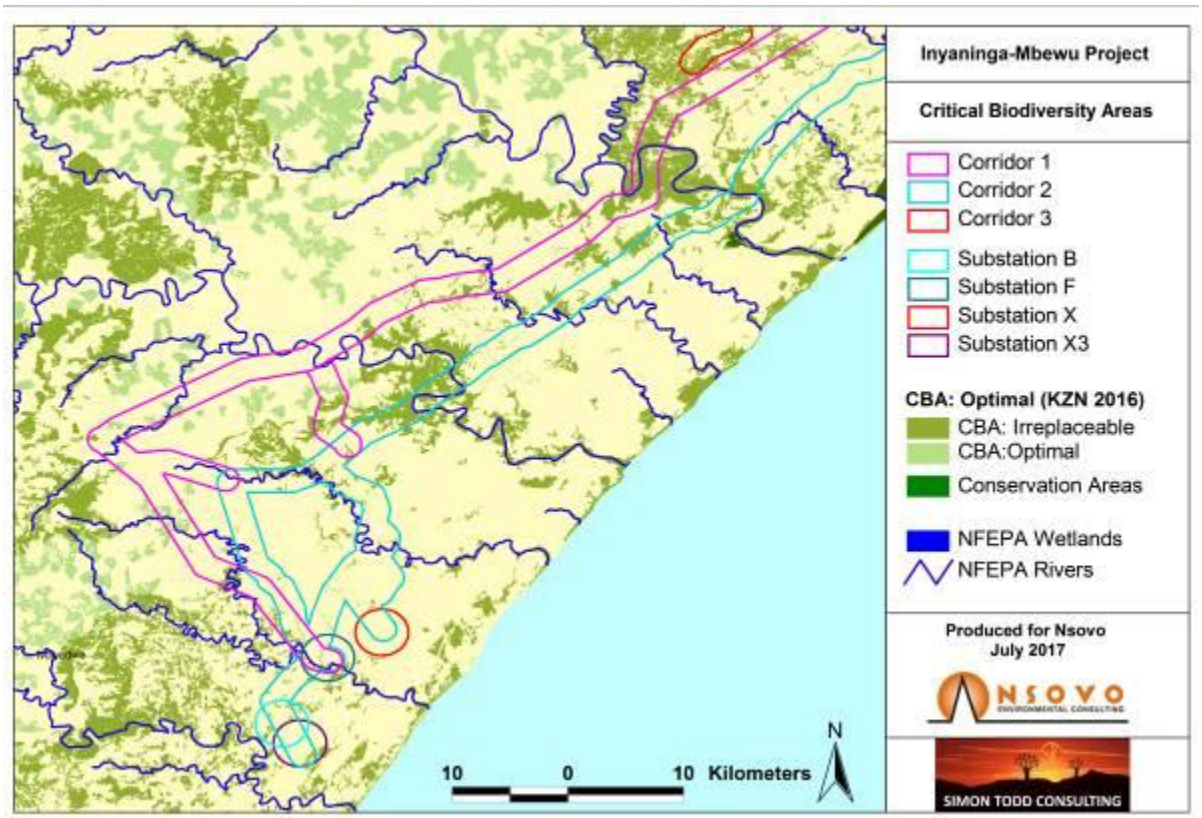

Figure 17: Critical biodiversity area within Inyaninga substations sites

The powerline corridors were assessed as to the extent of CBAs and listed vegetation types within their length (only the area different to/not duplicated by Corridor 1 was assessed for Corridor 3). Corridor 1 has ca 6405 ha (19%) of Irreplaceable CBA areas within its boundaries, whereas Corridors 2 and 3 have ca 4564 ha (12%) and 5702 ha (47%) respectively. In addition, the CBAs within Corridor 2 are much more fragmented than the other corridors which potentially allows for the pylons of the power line to be located within transformed areas to a greater degree than the other corridors. These results clearly indicate that Corridor 2 is the least sensitive in terms of potential impacts on CBAs.

Larger extents of the proposed corridors are within listed vegetation types –especially KwaZulu-Natal Sandstone Sourveld and Ngoni Veld (which has since been split into Moist and Dry Coast Hinterland Grassland). Corridor 1 contains 11470 ha of listed vegetation (as classified by the Threatened Ecosystems Layer, 2011), equating to 34% of its area. Corridor 2, along the coast, contains 6888 ha of listed vegetation (18%) and the short Corridor 3 contains 5863 ha of vegetation that has been listed (48%). It is however not only the extent of listed vegetation that is relevant but the nature of the vegetation. Sensitive vegetation types that are of very small extent naturally are more susceptible to impacts. The loss of just a few forest patches such as that of the Scarp Forest and Lowland grasslands (originally 10,000 ha, now only ca 6000ha) could significantly impact the conservation status of these vegetation types. Corridor 1 covers 1481 ha of this vegetation type and this represents a substantial percentage of

the grassland area left (24%). This is however, very fragmented and it is likely that the power line can be built with minimal impact on this vegetation type as the power line can be routed to avoid most remnant patches or will be able to span smaller fragments.

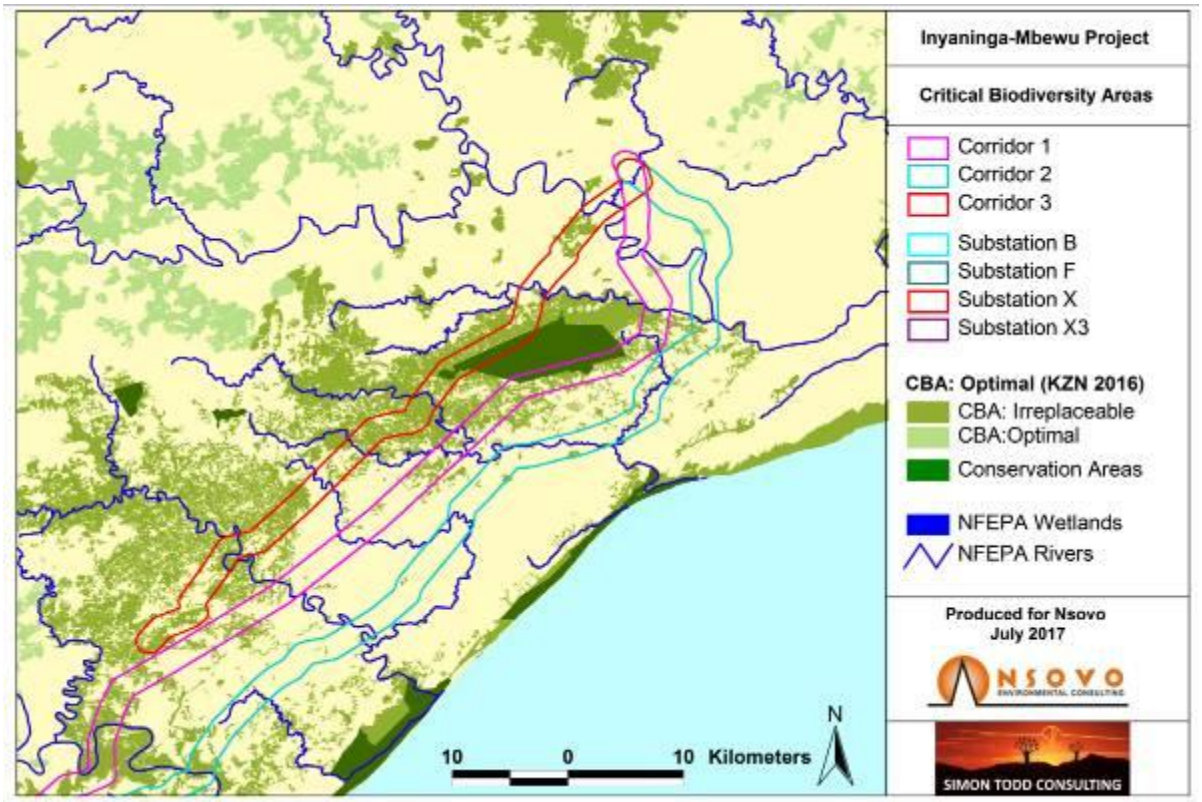

Figure 18: Critical biodiversity area within the propose substation sites and corridors

7.4.8 FAUNA

7.4.8.1 Mammals

According to the Mammal Map database, 75 mammal species have been recorded from the area, including several conservation-dependent species such as Elephant, Giraffe and Plains Zebra, which would not be encountered in the study area outside nature or private reserves. Seven species are listed, including the Blue Duiker *Philantomba monticola* (Vulnerable), Serval *Leptailurus serval* (Near Threatened), Common Dasymys *Dasymys incomtus* (Near Threatened), Leopard *Panthera pardus* (Vulnerable), Sclater's Mouse Shrew *Myosorex sclateri* (Vulnerable), the African Striped Weasel *Poecilogale albinucha* (Near Threatened), and the Southern Tree Hyrax *Dendrohyrax arboreus* (Endangered) are species of conservation concern that occur in the wider area. Given the availability of habitats along the different routes, it is either confirmed or likely that all of the above species are found within the power line corridors within areas of suitable habitat.

The Common Dasmys has been recorded from a wide variety of habitats, including forest and savanna habitats, swampland and grasslands but is listed as Near Threatened. The African Striped Weasel is rare to uncommon, with highest densities reached in moist higher rainfall grasslands (Stuart et al. 2015). The Southern Tree Hyrax is a low-density, selective species and there is an inferred continuing decline in the population from forest patch loss and forest quality degradation, especially along the coast, through agricultural and human settlement expansion (Gaylard et al. 2016). Its natural habitats are temperate forests, subtropical or tropical dry forests, subtropical or tropical moist lowland forests, subtropical or tropical moist montane forests, moist savanna, and rocky areas. The Blue Duiker is under unsustainable levels of threat, largely due to fragmentation of populations, illegal hunting and other anthropogenic influences (McLean et al. 2016). Sclater's Mouseshrew is listed as Near Threatened because its extent of occurrence is probably not much greater than 20,000 km², its area of occupancy is probably not much greater than 2,000 km², and its habitat is in decline (Baxter et al. 2008). It occurs near water in subtropical swamps and coastal forests (Baxter et al. 2008).

As the wider area of the site is transformed, larger mammal species are unlikely to occur in significant numbers in the majority of the footprint. Those areas supporting natural vegetation, such as forest or intact grasslands, which are traversed by the power line or substation, are considered more sensitive. As the intact habitats would be most important for habitat specialist species, the development would have a higher impact on these species if their habitat is significantly transformed. Areas of specific sensitivity for fauna include the Ongoye Forest and surrounding Scarp Forest fragments, the high-lying grassland areas of the interior especially along Corridor 1 and Corridor 3, and the areas of wetlands and drainage systems throughout the study area. However, the footprint of the power line is flexible and within the areas with a high degree of fragmentation, it should be possible to locate the pylons within transformed areas.

7.4.8.2 Reptiles

According to the Reptile Map database, 60 reptile species have been recorded from the quarter degrees covering the site, which is likely an underestimate as some areas have not been well sampled in the past. Seven species are considered of conservation concern. The uMlalazi Dwarf Chameleon *Bradypodion caeruleogula* (Endangered) has a very limited distribution and occurs in only three forests (Entumeni, Dlinza and Ongoye). Their habitat is impacted and vulnerable to external pressures (Tolley 2017). The Durban Dwarf Burrowing Skink *Scelotes inornatus* (CR) is an endemic and McLean et al. (2016) recognize this species as a flagship species for the region. It occurs in coastal habitat on Berea Red sands from Canelands in the north to Clansthal in the south (Marais 2011, in McLean et al. 2016). This part of the site is highly impacted by agriculture and the power line and substation is not likely to affect this species as the footprint in this area is likely to be restricted to transformed habitat. The KwaZulu Dwarf

Chameleon *Bradypodion melanocephalum* (VU) is also endemic and has much of its range within the eThekwini District Municipality, particularly more open habitat near the coast (McLean et al. 2016). The ranges of both species overlap built up areas and are thus susceptible to habitat transformation and degradation. The Green Mamba *Dendroaspis angusticeps* (VU) is considered an indicator of dune forest health and is fairly specialist in its habitat requirements. This species is rarely found in open terrain and prefers relatively dense, well-shaded vegetation. The Gaboon Adder *Bitis gabonica* (Near Threatened) may occur in the forest patches in the far north of the site, but this is unlikely as it tends to be restricted to coastal dunes.

The Natal Black Snake *Macrelaps microlepidotus* (Near Threatened) prefers lowland forest and coastal bush while the Large-scaled Grass Lizard *Chamaesaura macrolepis* (Near Threatened) prefers grassland, especially rocky, grassy and dry, open, sandy grasslands near the coast and on the Lebombo Mountains (IUCN RedList, retrieved 2017). The Variable Hinged Terrapin *Pelusios rhodesianus* (Vulnerable) inhabits weedy shallow dams and backwaters. All of these species are likely to occur in the study area, but are not likely to significantly affected by any of the power line alternatives as they are habitat specialists and their preferred habitats would tend to be avoided by the development.

Generally, the most important habitats in the area for reptiles are likely to be the lowland and upland forest patches, riparian areas and rocky outcrops along mountains and river valleys. The major potential impact of the development on reptiles is likely to be habitat loss or degradation as a result of the development. Impacts on reptiles can be minimized through ensuring that impact on intact vegetation is kept to a minimum.

7.4.8.3 Amphibians

Forty-three frog species are known from the area, indicating high amphibian diversity. This includes 4 listed species. The Pickersgill's Reed Frog *Hyperolius pickersgilli* (EN) inhabits densely vegetated, stagnant valley bottom wetlands from the coast to ca. 200 m above sea level (McLean et al. 2016). The Endangered Kloof Frog *Natalobatrachus bonebergi* is under threat due to the degradation of riverine gorge systems (Minter et al. 2004, in McLean et al. 2016) as this habitat is becoming increasingly threatened due to over-exploitation and pollution. Other species of concern include the Spotted Shovel-nosed Frog *Hemisus guttatus* (VU), an endemic that occurs in wooded and open habitat adjacent wetlands, but is extremely difficult to locate due to its fossorial habits (McLean et al. 2016). The Natal Leaf-folding Frog *Afrixalus spinifrons* (VU) is likely to occur at the site as it is relatively tolerant of land use changes.

As most frogs are associated with wetlands, water bodies and other moist areas such as kloofs and forest patches, direct impacts on frogs are likely to be relatively low as the power lines would specifically avoid these features wherever possible.

7.4.9 AVIFAUNA

7.4.9.1. Important Bird Areas (IBA's)

Some sites are exceptionally important for maintaining the taxa dependent upon the habitats and ecosystems in which they occur. Vigorous protection of the most critical sites is one important approach to conservation. Many species may be effectively conserved by this means. Patterns of bird distribution are such that, in most cases, it is possible to select sites that support many species. These sites, carefully identified on the basis of the bird numbers and species complements they hold, are termed Important Bird Areas (IBAs). IBAs are selected such that, taken together, they form a network throughout the species' bio geographic distributions. IBAs are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network. They are responsible for one (or more) of three factors:

- Hold significant numbers of one or more globally threatened species;
- Are one of a set of sites that together hold a suite of restricted-range species or biome-restricted species; and
- Have exceptionally large numbers of migratory or congregatory species.

There are six IBA's within 20kms of the proposed substations sites and power line corridors. The IBAs that are of most relevance to this study are the Ngoye Forest Reserve (SA065) and Mount Moreland (SA123), because of their proximity to the Corridors 1 and 3 and Inyaninga substation site Inyaninga X3 respectively.

Ngoye Forest Reserve is located approximately 11km inland of Mtunzini and 20 km east of Eshowe. The reserve is drained by the Mhlatuzane River and its tributaries to the north and the tributaries of the Mlalazi River to the south. Large patches of grassland cover the open ridges of the reserve with bush clumps on rocky outcrops in the grassland. Some of the valleys are comprised of open woodland while the climax forest is characterised by a continuous canopy of large trees (30m in height) and poorly developed shrub and field layers. The reserve is the only forest patch in southern Africa that, due to the year-round availability of no fewer than eight species of fig species, holds and supports Green Barbet *Stactolaema olivacea*, one of the most range-restricted of all birds. In addition, other globally threatened species found within the forest include Spotted Ground Thrush *Zoothera guttata*, African Crowned Eagle *Stephanoaetus coronatus* and Southern Ground-hornbill *Bucorvus leadbeateri* and the regionally threatened Eastern Bronze-naped Pigeon *Columba delegorguei.*

Populations of African Broadbill *Smithornis capensis*, Green Malkoha *Ceuthmochares australis*, White-eared Barbet *Stactolaema leucotis,* Scaly-throated Honeyguide *Indicator variegatus*, Olive Woodpecker *Dendropicos griseocephalus*, Red-backed Mannikin *Lonchura nigriceps*, Green Twinspot *Mandingoa nitidula*, Southern Tchagra *Tchagra tchagra*, Yellow-streaked Greenbul *Phyllastrephus flavostriatus*, Natal Spurfowl *Pternistis natalensis* and Forest Canary *Serinus scotops*, Grey Cuckooshrike *Coracina caesia*, Black-bellied Starling *Notopholia corrusca*,

Chorister Robin-Chat*Cossypha dichroa*, White-starred Robin *Pogonocichla stellata*, Brown Scrub Robin*Erythropygia signata* andOlive Bush-shrike *Chlorophoneus olivaceus* are common in the IBA (Marnewick *et al*.2015).

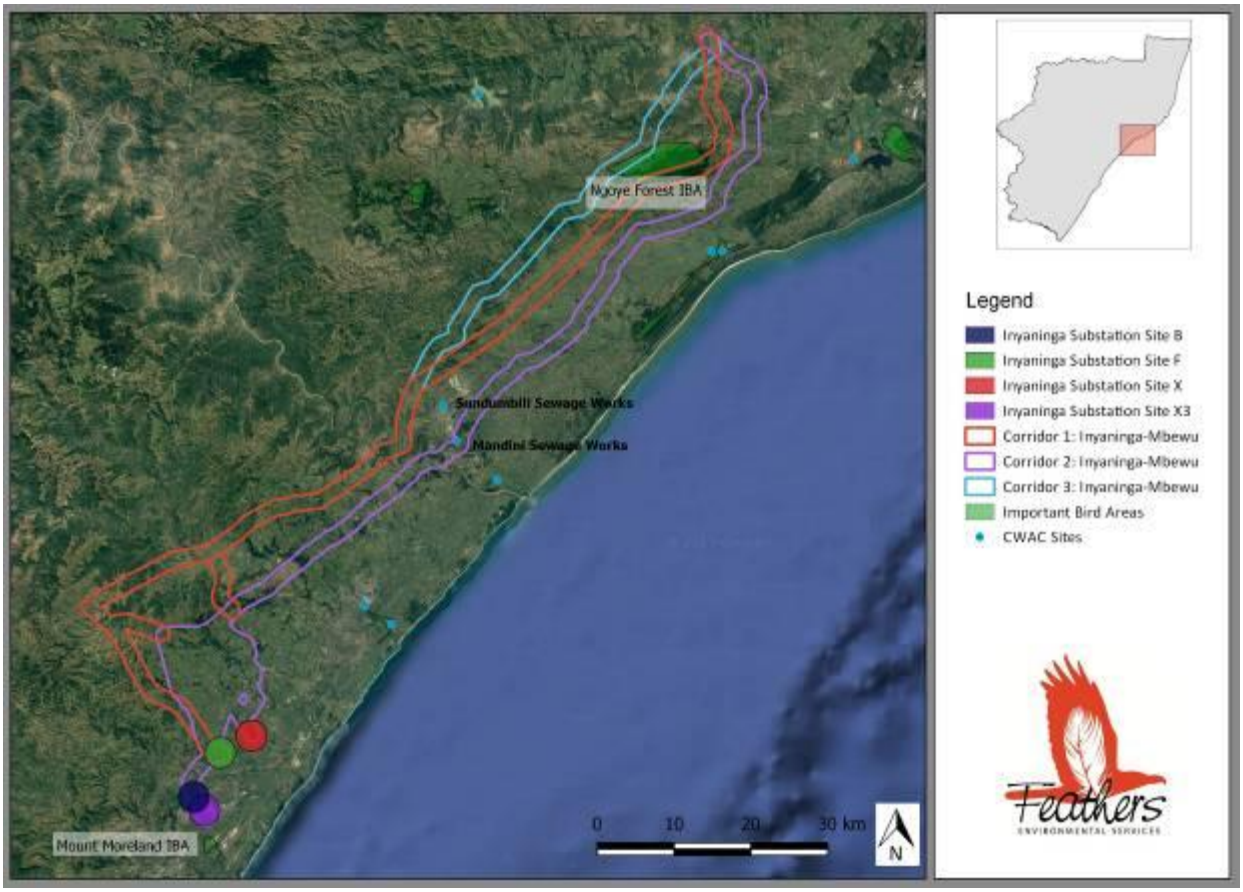

Figure 19: Regional map depicts the study area in relation to the neighbouring Important Bird Areas (IBAs) and the Coordinated Waterbird Counts sites

7.4.9.2. Coordinated Waterbird Counts (CWAC) data

The Animal Demography Unit (ADU) launched the Coordinated Waterbird Counts (CWAC) project in 1992 as part South Africa's commitment to International waterbird conservation. A CWAC site is any body of water, other than the oceans, which supports a significant number (set at approximately 500 individual waterbirds, irrespective of the number of species) of birds which use the site for feeding, and/or breeding and roosting (Young *et al*, 2003). This definition includes natural pans, vleis, marshes, lakes, rivers, as well as a range of man-made impoundments (i.e. sewage works). Currently the project regularly monitors over 400 wetlands around the country, and furthermore curates waterbird data for over 600 sites, providing much needed data for waterbird conservation around the world. The presence of a CWAC site within the study area is an indication of a large number of water dependent species occurring there and the overall sensitivity of the area.

Ten CWAC sites can be found within the immediate surrounds (in bird terms) of the study area. Eight of these are located some distance away, closer to the coastline. Relevant to this study, are the Mandini Sewage Works and Sundumbili Sewage Works, which are located in Corridor 2 and between Corridors 1 and 2 respectively. Unfortunately, very little data is available for both sites, with only five counts having been conducted at each location over a 23-year period. The Mandini Sewage Works shows no unusually large concentrations of any species. Although the common duck species are numerous in summer, species diversity and bird numbers are low. Most of the water dependent species, resident in the area, prefer to utilise the Tugela River.

The Sundumbili Sewage Works has recorded twice the number of bird species counted at Mandini during the same period, but numbers of most species were low. Yellow-billed Stork *Mycteria ibis,* Purple Heron *Ardea purpurea*, African Fish-Eagle *Haliaeetus vocifer*, Black Crake *Amaurornis flavirostris*, three species of tern and three species of kingfisher have previously been recorded at the site. African Jacana *Actophilornis africanus* and Common Sandpiper *Actitis hypoleucos* were recorded in high number in summer 1995 and 1996 respectively. White-faced Duck *Dendrocygna viduata* counts are generally higher in winter.

Similarly, to IBAs, the proximity of these CWAC sites provides an indication of the waterbird species that are likely to occur in various wetland habitats within the study area. Given the size and nature of the CAWC sites (i.e. man-made impoundments) and the common species that frequent both locations, the displacement and collision impacts associated with the construction and operation of the proposed Inyaninga substation and the Inyaninga-Mbewu 400kV power line at these two sites are likely to be low. However, the impact of the proposed developments of the natural water bodies (i.e. rivers, dams and wetlands) prevalent in the study area is likely to be of high significance.

7.4.9.3. SOUTH AFRICAN BIRD ATLAS PROJECT 2 DATA (SABAP2)

A total of 397 bird species have been recorded within the relevant pentads during the SABAP2 atlas sing period to date. The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur within the areas earmarked for the proposed developments, particularly where pockets of natural vegetation/habitats persist. Of the 397 species, 33 of these are considered to be of conservation concern (Red List), according to the 2015 Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland (Taylor *et al*, 2015) and the IUCN Red List (2016). The White Stork, which is not listed, but is protected internationally under the Bonn Convention on Migratory species, was also recorded.

With the exception of Lanner Falcon, African Crowned Eagle, African Marsh-Harrier and Southern Bald Ibis *Geronticus calvus*, the majority of Red List species (n=29) have been recorded in less than ten of the 41 pentads that make up the study area. In addition, each of the 33 Red List species have been recorded in low numbers, with a maximum of 15 individual birds (i.e. Green Barbet) being recorded over the ten-year survey period. The low report

rates for these Red List species can possibly be attributed to 1) the fact that not all of the 41 pentad grid cells have been surveyed equally and extensively, with only ten pentads surveyed more than 20 times over the last decade, or 2 a result of the fairly high levels of disturbance caused by the surrounding land use practices.

The significant disturbance and habitat loss experienced in the study area, particularly along Corridor 2 has undoubtedly displaced many of the naturally occurring species that under optimum conditions would inhabit these areas. Although this report focuses on Red List species, since the impacts associated with the construction and operation of the Inyaninga substation and the Inyaninga-Mbewu 400kV power line are likely to be more biologically significant for these species, the impact on non-Red List species is also assessed, albeit in less detail. Furthermore, much of the mitigation recommended for Red List species will also protect non-Red List species in the study area. The non-Red List species that have been considered for this assessment include large eagles, buzzards, kestrels, herons, geese, ibis and various water bird species.

7.4.10 LAND TYPES AND AGRICULTURAL POTENTIAL

7.4.10.1 Soil Pattern for Transmission Line Corridors

There is a great number of separate land types occurring within the study area due mainly to the prevailing undulating terrain pattern across most of KwaZulu-Natal and it was therefore decided to group the land types according to their broad soil pattern. Table 15 and Figures 20 and 21 depict the broad soil patterns that occur within one or more of the various route corridors or substation study areas. There will be a significant variation in the soils occurring within these broad patterns, but they can generally be meaningfully grouped together to give an indication of soil variation, from which agricultural potential can be derived.

Table 15: Broad soil patterns occurring in the study area

Soil Patterns	Description
A: Red and/or yellow, freely-drained soils	Aa Humic topsoils (Ia, Kp, Ma >40%), red and/or yellow Ab Red (yellow soils <10%); dystrophic/mesotrophic > eutrophic Ac Yellow/red (yellow & red soils each >10%); dystrophic/mesotrophic > eutrophic
D: Duplex soils dominant	Db Non-red subsoils >50% of duplex component Dc As for Da/Db, but also with >10% Ea soils
E: One or more of: vertic melanic and/or red structured (Sd) soils dominant	Ea Dark, blocky clay topsoils (often swelling clays) and/or red, structured clays

F: Mainly Glenrosa and/or Mispah forms (other soils may occur as long as land type does not qualify elsewhere)	Fa Shallow, and/or rocky, often steep, highly leached (very little lime) Fb Shallow, and/or rocky, often steep, moderately leached (some lime, mainly in valleys)
H: Grey regic sands	Hb Some (20-80%) deep, grey sands (usually near coast). Other soils may occur
I: Miscellaneous land classes	Ia Deep alluvial deposits (>60%), usually on river floodplains (Du, Oa forms)

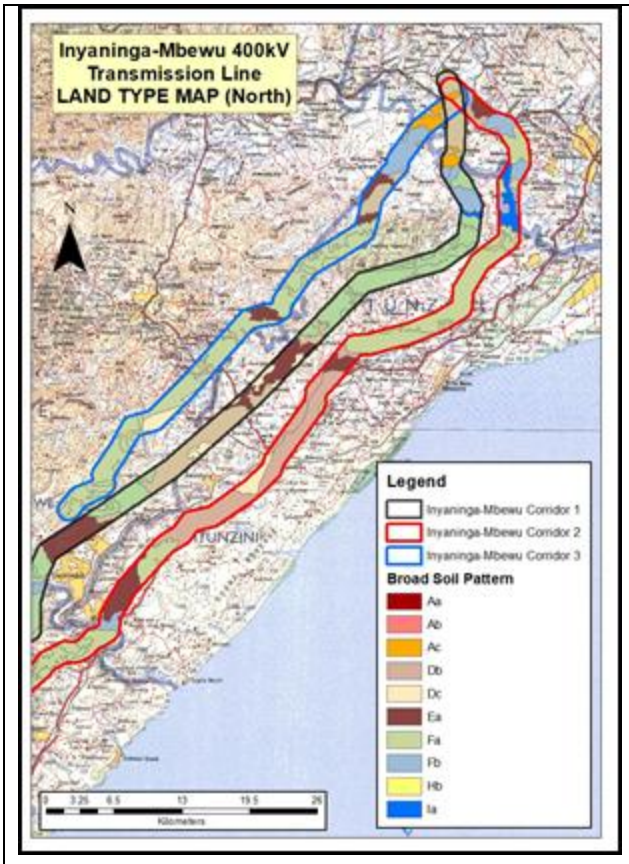

Figure 20: Broad soil patterns (north)

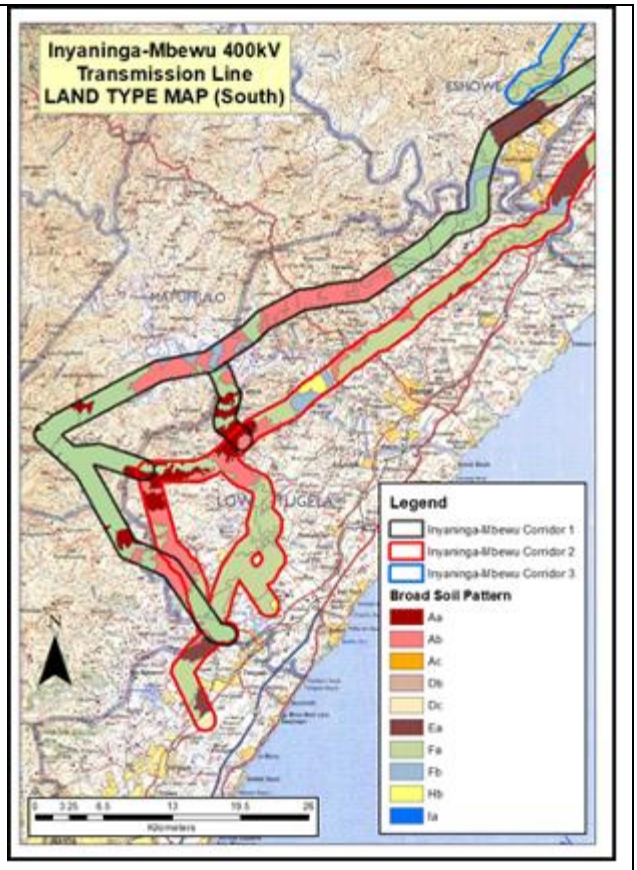

Figure 21: Broad soil patterns (South)

7.4.10.2 Agricultural Potential for Transmission Line Corridors

The occurrence and characteristics of the soils occurring in each land type have been summarized and assessed in terms of broad agricultural potential. This is expressed in the percentage of soils within a land type that can be regarded as being of high potential, so that land types with a higher potential of such soils would be regarded as more suitable for agriculture, especially cultivation. Soils falling into this category will include freely-drained, loamy

soils with a sufficient rooting depth (generally >900 mm), lacking strong structure, stoniness or any signs of wetness. The major areas with high potential soils (>40% of the landscape) occur immediately to the north of Inyaninga at the westward extremity of the Corridors and that Corridor 3 (the shortest route to the north) has a significant proportion of high potential soils.

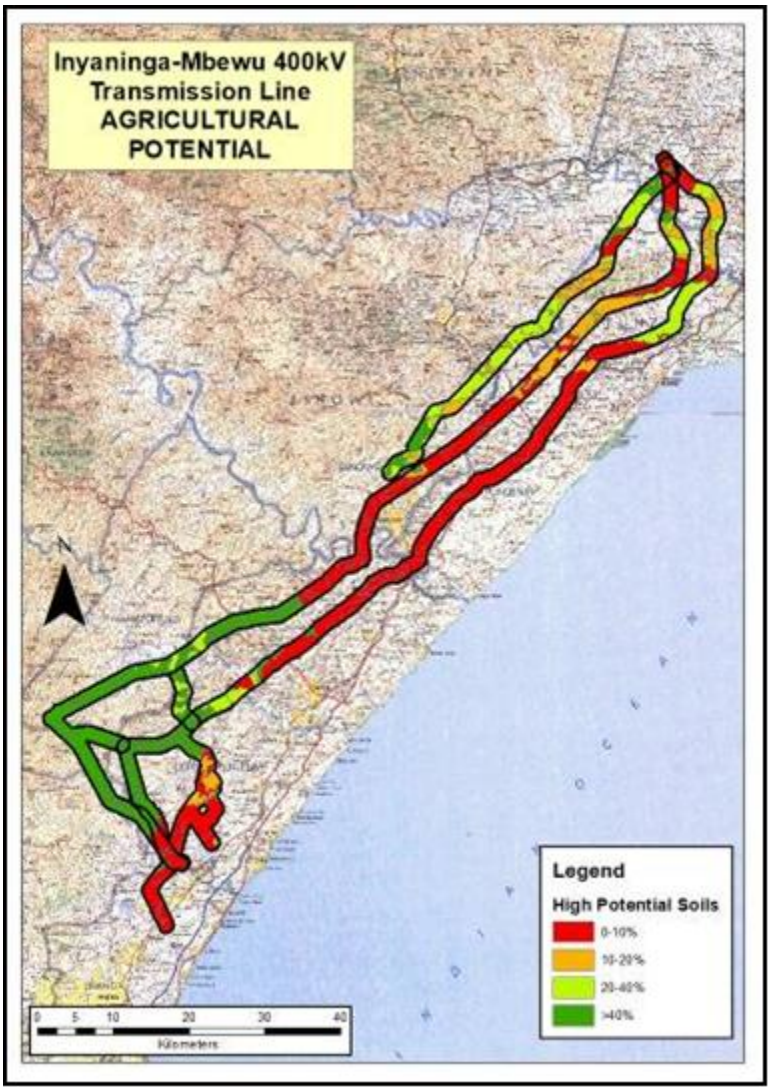

Figure 22: Broad agricultural potential

7.4.10.3 Soil Pattern for Substation Sites

Most of the study areas are dominated by soils of ***Fa*** land types, which are generally shallow soils on weathering rock. However, Site X3 has a large proportion of ***Ea*** soils (dark clay soils) and ***Dc*** (duplex soils), which have a heavier texture and may be more erodible if the topsoil is exposed. Very little of the soils in the four study areas has a

high potential for agriculture, but a more detailed field survey would need to be carried out once specific sites are identified.

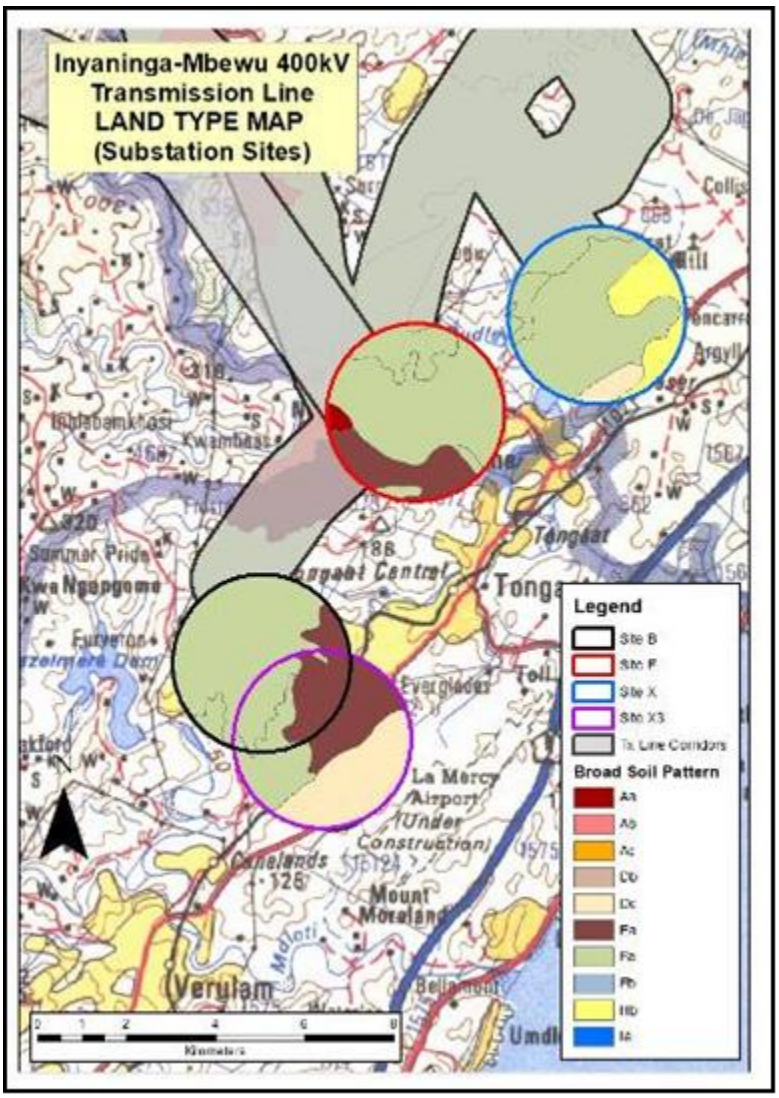

Figure 23: Substation sites

7.4.10.4 Erodibility

Most of the study area is not significantly susceptible to erosion. The area has a relatively high rainfall, with good natural vegetation cover. However, slopes may be steep in places, which can increase the erosion susceptibility, and the areas with Db and Dc land types will have a higher percentage of duplex soils (with a sandier topsoil on top of a clayey subsoil), which are more erodible if the vegetation cover becomes disturbed.

Under any circumstances, if vegetation cover is disturbed or removed (such as during the construction phase of a transmission line) and especially on steeper slopes, then erosion can occur.

7.4.11 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

The archaeological and cultural heritage impact assessment for the proposed development revealed no obvious archaeological (Stone and Iron Ages) or historical material that will need to be mitigated prior construction in the footprint of the study area. This however could be two fold, firstly and most likely it could have been that there are no archaeological sites in the proposed area, secondly, it could have been as a result of bush encroachment, wherein materials could have been hidden in some of the dense vegetation that had been noted in the area. It should be borne in mind that, none of the materials that can be found here can be considered to be of such significance that can prevent the proposed development from proceeding. Noteworthy that houses (structures) which bears historical significance where noted in the proposed area. Although no significant archaeological materials were identified on the proposed area for substation and power-line, the recommendation from the heritage specialist will be considered.

7.4.12 VISUAL ASPECTS

Visual appreciation or dislike is subjective and thus what is aesthetically pleasing to one can be displeasing to another. The visual analysis of a landscape, the impact of new developments and structures tend to be complicated and it is evident from previous experience that when dealing with reaction to landscape changes, a large diversity of opinion exists. Much of the proposed area is utilised for purposes of agriculture (i.e. sugarcane plantation).

The agricultural landscapes of much of the proposed location or sites are not necessarily sensitive but are important to preserve for their aesthetics. It is, thus, necessary to maintain a near natural visual landscape, with limited effect on aesthetic, to enable the continuation of nature-based economic activities such as ecotourism in the area.

In this regard, it is an imperative that Eskom be sensitive from a visual impact perspective, to the requirements of the local people, notably rural communities, farmers and operators involved in eco-tourism activities. Many topographical features influence this environment and these features will need to be utilised when selecting substation location and powerline alignment so as to minimise visual impacts and intrusions.

7.4.13 ECOTOURISM

Tourism represents an important economic driver in South Africa. Given the country's abundance of natural beauty, year round good weather and well established tourism infrastructure, it is not surprising that currently, one in 22 employed people in South Africa work in the tourism industry, representing 4, 5% of the total workforce.

Accordingly, the Tourism industry is a key contributor to the KwaZulu-Natal economy. The province's tourism attractions, perhaps less well known internationally, surpass the national norm in many respects and are structured around four components, the coastal holiday areas with their beaches, sunshine, boating, surfing and fishing; the wildlife game parks in the north; the Drakensberg Mountains and the historical Battlefields. The tourism market in KwaZulu-Natal is dominated by domestic travellers; while international travellers only account to 8%.

Actual tourism trends for the local study area are difficult to come by and the estimates below are largely based on interviews with product owners and tour guides of the ecotourists using bird guides at Ongoye Forest, 70% are South African and 30% international tourists. 80% of the beach market around Ballito and related ecotourism activities in the hinterland areas are domestic (South African). The beaches remain the key reason for travel. Many ecotourists in the study area are specialists / niches (birding, mountain biking, photography) and traditional wildlife based ecotourism is largely clustered to the northern parts of the province (Hluhluwe Game Reserve and iSimangaliso Wetland Park). Figure 24 below depicts some of the tourism products within the proposed study area.

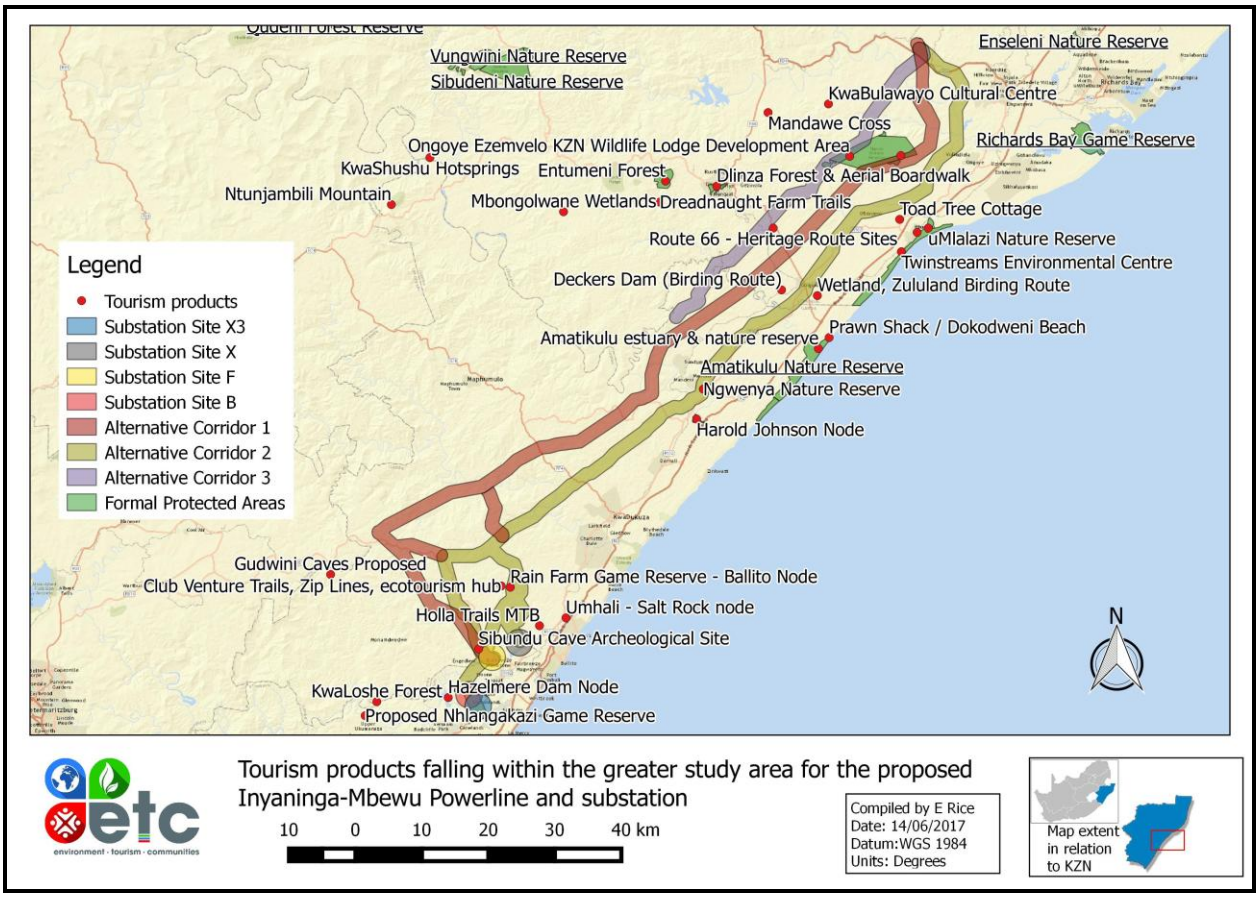

Figure 24: Tourism products within the study area (ETC, 2017)

7.5 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section of the Scoping Report describes the potential impacts that the proposed project may pose on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified, have been assessed based on the consultant's opinion after numerous visits to the site and previous experience on similar undertakings as well as consultation with specialist studies. Refer to Table 16 below, for the potential impacts identified. These impacts are similar for all three alternatives and will be comprehensively assessed during the EIA phase of the project and. associated mitigation measures proposed.

7.5.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified for the proposed development are described in **Table 16** as follows:

Table 16: Potential Environmental Impact Identified

Issue	Rating	Description
Employment	Positive-No mitigation required	Job creation and investments into the project will result in opportunities during the planning and design phase. This impact will typically be limited to skilled engineers and planning professionals. Proposed project will result in very limited opportunities to the skilled local community during the construction phase. This impact will be positive and provincial in extent.
Air Pollution	Neutral	Potential air pollutant during construction may be dust emanating from site preparation and excavations during construction. Given the nature and magnitude of the proposed project it is anticipated that before mitigation the impact will be local in extent, and short term. Mitigation measures such as dust suppression can reduce the impact to become site specific.
Visual Impact	Negative	The visual impact of an object in the landscape decreases quickly as the distance between the observer and the object increases. The visual impact at 1 km is approximately a quarter of the impact viewed from 500m; and the visual impact at 2km is one eighth of the impact viewed from 500m. Therefore, objects appear insignificant in any landscape beyond 5km. The visibility of the proposed structure and infrastructure would be a function of several factors, including: landform, vegetation, views and visibility, genius loci (or sense of place), visual quality, existing and future land use, landscape character and scale.

Issue	Rating	Description
		The proposed activity will change the visual character of the site particularly considering that the proposed site is located in an area that is sloping; the elevated points of the site can be viewed from the nearby roads, however, it must be noted that there are already existing overheard power lines and a substation located within the vicinity of the proposed project site. Local variations in topography and man-made structures could cause local obstruction of views in certain parts of the view shed. Given the topography of the study area the impact can be considered definite, long term, local in extent but low in significance. A visual impact study will be commissioned and included as part of the EIA phase.
Fauna	Negative	As the wider area of the site is transformed, larger mammal species are unlikely to occur in significant numbers in the majority of the footprint. Those areas supporting natural vegetation, such as forest or intact grasslands, which are traversed by the power line or substation, are considered more sensitive. Further, the most important habitats in the area for reptiles are likely to be the lowland and upland forest patches, riparian areas and rocky outcrops along mountains and river valleys. The major potential impact of the development on reptiles is likely to be habitat loss or degradation as a result of the development. Impacts on reptiles can be minimized through ensuring that impact on intact vegetation is kept to a minimum.
Flora	Negative	The study area is located within a wide variety of vegetation types within the Azonal Vegetation, Grassland, Forests, Indian Ocean Coastal Belt and Savanna Biomes. The powerline will traverse through thirteen vegetation units with the KwaZulu-Natal Coastal Belt Grassland being the most dominant vegetation type. Patches of Scarp Forests are also present throughout the proposed corridors. Potential ecological impacts resulting from the proposed development would stem from a variety of different activities and risk factors associated with the preconstruction,

Issue	Rating	Description
		construction and operational phases of the project potentially including the following: **Construction Phase** • Vegetation clearing for access roads, lay down areas and the substation site itself may impact intact vegetation. • Increased erosion risk would occur due to the loss of plant cover and soil disturbance during the construction phase. Some of the site options are steep and risk of erosion would be high. This may impact downstream riparian and wetland habitats if a lot of silt enters the drainage systems. • Increased human presence can lead to illegal plant harvesting and other forms of disturbance such as fire. **Operational Phase** • The presence of the facility may disrupt the connectivity of the landscape for some species which may impact their ability to disperse or maintain gene flow between subpopulations. • The facility will require management and if this is not done appropriately, it could impact adjacent intact areas through impacts such as erosion, alien plant invasion and contamination from pollutants, herbicides or pesticides. **Cumulatively,** the development would contribute to the cumulative fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.
Noise	Negative	In South Africa, the assessment of noise levels in the environment is governed by the South African Bureau of Standards (SABS) noise standard 0103 – 'The measurement and rating of environmental noise with respect to annoyance and to speech communication' (SABS 1994). Additional SABS standards cover the measurement of

Issue	Rating	Description
		noise over different distances from the source (SABS 0357 – 'The calculation of sound propagation by the Concave method'), and standards for different sectors (e.g. industry). An increase in noise is expected to emanate from construction activities, which might have an impact especially on the surrounding farms. Noise associated with the construction activities can be mitigated by limiting the construction operation to business hours, during which noise will not be of such a big concern to surrounding residents. According to the SABS 0103 acceptable noise levels at day time is 45dBA. A noise intrusion is disturbing if it exceeds 7dBA or more. Given the nature of the project, it is highly unlikely that the stipulated noise levels will be exceeded at any given time. During the operational phase the impact of noise will also be reduced to almost insignificant levels, given the nature of the proposed project. Noise has been identified as potentially low due to the proposed development being in a remote area, far removed from communities. The noise impact may be local during construction and site specific during operations.
Soil and Agricultural potential	Negative	Most of the study areas are dominated by soils of Fa land types, which are generally shallow soils on weathering rock. However, Site X3 has a large proportion of Ea soils (dark clay soils) and Dc (duplex soils), which have a heavier texture and may be more erodible if the topsoil is exposed. Very little of the soils in the four study areas have high potential for agriculture, as a result, the proposed development will make little difference to the impact on the soil resource and agricultural potential. However, these impacts will be negative, as the natural environment will be disturbed. Further, most of the study area is not significantly susceptible to erosion. The area has a relatively high rainfall, with good natural vegetation cover. However, slopes may be steep in places, which can increase the erosion

Issue	Rating	Description
		susceptibility, and the areas with Db and Dc land types will have a higher percentage of duplex soils (with a sandier topsoil on top of a clayey subsoil), which are more erodible if the vegetation cover becomes disturbed. Under any circumstances, if vegetation cover is disturbed or removed and especially on steeper slopes, then erosion can occur. The specific significance on the potential loss of agricultural soil, as well as soil disturbance, will be assessed during the EIA phase and mitigation measures will thus be proposed.
Bird Population	Negative	Some sites are exceptionally important for maintaining the taxa dependent upon the habitats and ecosystems in which they occur. Vigorous protection of the most critical sites is one important approach to conservation. Many species may be effectively conserved by this means. Patterns of bird distribution are such that, in most cases, it is possible to select sites that support many species. Due to its size and prominence, electrical infrastructure constitutes an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are electrocution of birds (and other animals) and collision of birds with power lines. With proper mitigation measures implemented, these potential impacts can be reduced. Major risks to birds that may be caused by the proposed facilities are disturbance by construction activities (temporary), on-going disturbance during operation phase, collision with and electrocution on the power line. The proposed development will pose a limited threat to the birds occurring in the vicinity of the new infrastructure. This is largely due to the extensive impacts already evident at the site (the existing 400kV power line, transformed landscape and few suitable avian micro-habitats) coupled with the short length of the proposed power line. The power line poses a low collision risk and a low electrocution risk. The impact of displacement due to habitat

Issue	Rating	Description
		transformation will have a low impact on avifauna due the largely transformed nature of the proposed site. Bird species will be particularly sensitive to this disturbance during the breeding season. The proposed site alternatives traverse through agricultural lands, natural habitats and close to national and domestic roads. Therefore, species within this landscape often experience disturbance; however, the proposed substation is anticipated to have low to medium significance. The impact assessment phase will undertake a comprehensive assessment of the extent of the impact at all alternative sites.
Waste	Negative	Naturally, the inhabitation of the land will result in the accumulation of various forms of waste in the area. The aesthetic value of the area would decrease if such waste is not collected and disposed of appropriately. Waste material will be generated during the construction phase. Such waste may accumulate from the workers campsite or from litter left around the work area by the construction staff. Other waste substances may accumulate from cement bags amongst other construction material. The impact of waste is definite and will last for the duration of the construction phase as well as the operational phase, although reduced.
Soil Erosion	Negative	As mentioned above, most of the study area is not significantly susceptible to erosion. The area has a relatively high rainfall, with good natural vegetation cover. However, slopes may be steep in places, which can increase the erosion susceptibility, and the areas with Db and Dc land types will have a higher percentage of duplex soils (with a sandier topsoil on top of a clayey subsoil), which are more erodible if the vegetation cover becomes disturbed. Further, movement of heavy machinery may cause destabilisation of soils which then become susceptible to erosion.
Heritage	Negative	The landscape of the area proposed for development is comprised of two components, i.e., rural and urban. The

Issue	Rating	Description
		rural area is made up of villages which are to some extent sparsely populated, and it is here where graves are common. The second component is semi-urban and it is characterised of industrial landscape, and possesses amongst others infrastructure elements such as major roads and bridges, and it is here were high scale farming is common. Archaeological sites dating to the Stone, Iron and Historical Age are known to occur in the region of study area. However, from the survey conducted, most of the known sites would only have an indirect impact. The study area was investigated for sites of heritage significance that might be affected by the construction of the proposed powerline and substation. The only sign of sites of heritage potential were graves and historical structures found in various areas of corridors, as well as two significant Battlefields i.e., Ndondakasuka and Nyezane, and the memorial of Gingindlovu which are located in the vicinity of the proposed corridors. Although these will not be directly affected, the visual impact which will be caused by this proposal should be considered. Despite that no remains of Stone/ Iron Age sites were noted during site visit, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools.
Surface and Groundwater Pollution	Neutral	The proposed alternatives are in close proximity to a number of watercourses. The impact on water quality, if any, could be sedimentation, decrease in quality and possible contamination of surface water and groundwater. This could result from fuel spillages, sewer systems, liquid waste, etc. An increased volume of storm water runoff, peak discharges, and frequency and severity of flooding is therefore often characteristic of transformed catchment. The impact on water is site specific but can be local or regional if proper measures are not put in place.

Issue	Rating	Description
		There may be a need to apply for a Water Use Licence with DWS considering the proximity of the study area to surface water bodies.
Social Environment	Negative/Positive	The construction phase may have a negative impact on the surrounding landowners if not properly managed. It could result to disturbance of residents as a result of construction related activities. Other social related issues may include theft and risk of fire. Conversely, a positive impact can emanate from the proposed development through employment of local residents. Also, a micro-economic environment could be created through vending/trade between contract workers and the locals. This impact will be local.
Climate	Neutral	Local climate conditions do not appear to be of a significant concern to the proposed project. In a broader scale the project will have no impact on the local and/or global climate change.
Topography	Negative	The topography of the study area is undulating; this may pose design challenges particularly in the steeper area.
Tourism	Neutral	The impacts of electricity transmission infrastructure on eco-tourism are closely related to the impacts on the surrounding natural environment, upon which ecotourism products rely. Clearing of vegetation, disturbing the topographic features of the land, degradation resulting from erosion/loss of top soil and fauna mortality resulting from powerline strikes are all immediate impacts on the environment which will in turn effect the economic viability of the tourism products on that specific property.
Traffic	Negative	A significant amount of material and equipment will be delivered to the site during the construction phase of the development. It is therefore expected that there will be a considerable impact considering that the N2 and R319 considering that it forms part of the Garden Route. This will have an indirect impact on tourism.

7.5.2 ASSESSMENT OF CUMULATIVE IMPACTS PER SITE

Cumulative impacts in relation to an activity, means the past, current and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations).

This section presents the assessment anticipated cumulative impacts of the proposed project per site alternative as well as mitigation measures. Cumulative impacts for this alternative would include:

- Impact on agriculture;
- Ecological Fragmentation;
- Bird collision with power lines;
- Heritage;
- Traffic; and
- Visual.

7.5.2.1 Agricultural potential

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Agricultural impacts							
The impacts of constructing a transmission line will be negative, as the natural environment will be disturbed. However, the isolated nature of the transmission towers means that the impact on the soil resource will be small as most agricultural activities can still be practiced next to or underneath a transmission line; therefore the specific significance on the potential loss of agricultural soil, as well as soil disturbance will be low. Most of the study area is not significantly susceptible to erosion as the area is generally characterised by good natural vegetation cover. Even with the relatively high rainfall, the vegetation cover counter affects the potential impact. These potential impacts will be medium without mitigation measures which can be reduced to low after application of mitigation measures.							
Alternative B	No	Negative	1	5	6	5	**60**
	Yes	Negative	1	4	4	4	**36**
Alternative F	No	Negative	1	5	6	5	**60**
	Yes	Negative	1	4	4	4	**36**
Alternative X	No	Negative	1	5	6	5	**60**
	Yes	Negative	1	4	4	4	**36**
Alternative X3	No	Negative	1	5	6	5	**60**
	Yes	Negative	1	4	4	4	**36**
Corridor 1	No	Negative	1	5	6	4	**48**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	1	4	4	3	**27**
Corridor 2	No	Negative	1	5	6	4	**48**
	Yes	Negative	1	4	4	3	**27**
Corridor 3	No	Negative	1	5	6	4	**48**
	Yes	Negative	1	4	4	3	**27**
Mitigation Measures							
• Roads should avoid steep slopes wherever possible. • Where steep slopes are used, road stabilization measures (culverts, run-off trenches, banking of bends etc) should be implemented. • Restrict areas cleared of vegetation to road surfaces only. • Mitigation measures will include the rehabilitation of any bare soil areas caused by the construction process (including any access roads or tracks) and wherever possible, the siting of pylons away from any cultivated lands, but rather to use servitudes and boundary lines. • Special care should be given to areas with steeper topography.							

7.5.2.2 Aquatic Ecology

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Aquatic Ecology (Impacts associated with soil erosion, sedimentation) Construction Phase							
The corridor and substations sites are associated with 17 quaternary catchments through which 22 Sub-Quaternary Reaches (SQRs) flow. Subsequently, it is anticipated that during the construction phase, moderate to large scale earth moving equipment will be required for civil works; therefore this will result to compaction which will enhance runoff, leading to an increased risk of erosion down slope. Further vegetation clearing will expose sediments to wind and waters erosive effects wherein eroded sediments will be transported down slope and deposited within the aquatic environment thus altering habitat availability as well as species compositions within rivers. Vegetation clearing also poses the risk of allowing invasive plant species to colonise the corridors or substation site if management actions are not put in place during the construction phase. The potential impacts expected are associated with soil erosion; pollution and sedimentation are low before and after mitigation for all for substation sites; while the impacts associated with alien vegetation are high in significance without mitigation and low with mitigation. However, the specialist emphasised that Inyaninga site F is considered to have a higher risk profile as it is more closely associated with a large river system (Tongati River). The identified impacts are similar in significance for the three corridors as they are also characterised environments, however, If the pylons are constructed in a responsible manner all corridors may suffice in terms of aquatic ecology.							
Alternative B	No	Negative	2	2	6	4	**40**
	Yes	Negative	1	1	4	1	**6**
Alternative F	No	Negative	2	2	8	4	**48**
	Yes	Negative	1	1	6	2	**16**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Alternative X	No	Negative	2	2	6	4	**40**
	Yes	Negative	1	1	4	1	**6**
Alternative X3	No	Negative	2	2	6	4	**40**
	Yes	Negative	1	1	4	1	**6**
Inyaninga Aquatic Ecology (Impacts associated with pollution) - construction phase							
Alternative B	No	Negative	2	3	6	3	**33**
	Yes	Negative	1	2	4	1	**7**
Alternative F	No	Negative	2	2	7	4	**48**
	Yes	Negative	1	2	6	2	**18**
Alternative X	No	Negative	2	3	6	3	**33**
	Yes	Negative	1	2	4	1	**7**
Alternative X3	No	Negative	2	3	6	3	**33**
	Yes	Negative	1	2	4	1	**7**
Inyaninga Aquatic Ecology (Impacts associated alien vegetation) **Construction Phase**							
Alternative B	No	Negative	3	3	6	3	**56**
	Yes	Negative	2	2	4	2	**16**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Alternative F	No	Negative	3	3	8	4	**64**
	Yes	Negative	2	2	6	3	**34**
Alternative X	No	Negative	3	3	6	3	**56**
	Yes	Negative	2	2	4	2	**16**
Alternative X3	No	Negative	3	3	6	3	**56**
	Yes	Negative	2	2	4	2	**16**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Aquatic Ecology (Impacts associated with soil erosion, sedimentation) **Operational Phase**							
Alternative B	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**
Alternative F	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**
Alternative X	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Alternative X3	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Aquatic Ecology (impacts associated with pollution) **Operational Phase**							
Alternative B	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**
Alternative F	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**
Alternative X	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**
Alternative X3	No	Negative	2	2	4	2	**16**
	Yes	Negative	1	1	2	1	**4**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Aquatic Ecology (Impacts associated alien vegetation) **Operational Phase**							
Alternative B	No	Negative	4	5	4	2	**60**
	Yes	Negative	2	2	2	1	**14**
Alternative F	No	Negative	4	5	4	2	**60**
	Yes	Negative	2	2	2	1	**14**
Alternative X	No	Negative	4	5	4	2	**60**
	Yes	Negative	2	2	2	1	**14**
Alternative X3	No	Negative	4	5	4	2	**60**
	Yes	Negative	2	2	2	1	**14**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	

Mitigation Measures

- Maintenance vehicles are to be prohibited from driving within the riparian zone and must be constrained to established support roads at all times;
- No vehicles should be allowed within any river system;
- If significant work needs to be carried out within an aquatic ecosystem a risk assessment should be conducted with input from an aquatic ecologist;
- Erosion monitoring at the bases of the pylons and at the substations must be carried out in order to identify issues early and implement remedial measures to reduce environmental degradation;
- All site camps must be kept at least 60 m outside of aquatic ecosystems;
- No washing of vehicles or personal is permitted within any river;
- Soils stock piles, concrete and building rubble must be kept at least 60m away from any river;
- No vehicles or machinery are to be permitted within the aquatic environment;
- Maintenance roads may also not enter aquatic ecosystems.
- Storm water controls within the substation facility are essential; therefore, a storm water management plan must be compiled to prevent the threat of high rainfall events leading to erosion and the deposition of sediments within aquatic ecosystems;
- Water must not be abstracted from any river for any irrigation, construction or rehabilitation purposes unless a water use license has been granted allowing the specific activity;
- Rehabilitation of the disturbed sediments needs to be conducted in a timely manner and the indigenous vegetation planted should be monitored and maintained to prevent die off and alien invasive plant encroachment;
- Construction activity should be restricted to the immediate footprint of the infrastructure; and
- The selection of corridor 2 will reduce the collision of the red list with the earth wire of the proposed powerline.

7.5.2.3 Avifauna

The development of the proposed project will result in various impacts of low to medium significance to the birds occurring in the vicinity of the new infrastructure which can be reduced through the application of mitigation measures. Given the presence of existing habitat degradation and disturbance, it is anticipated that the proposed project can be undertaken within the study area with acceptable levels of impact on the resident avifauna

Table 17: Avifaunal impact rating per alternatives

	Alternatives	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
Displacement as a result of habitat transformation	Alternative B	No	Negative	Site (1)	Permanent (5)	Low (4)	Highly Probable (4)	**Medium (40)**
		Yes	Negative	Site (1)	Permanent (5)	Minor (2)	Improbable (2)	**Low (16)**
	Alternative F	No	Negative	Local (2)	Permanent (5)	Moderate (6)	Highly Probable (4)	**Medium (52)**
		Yes	Negative	Local (2)	Permanent (5)	Low (4)	Probable (3)	**Medium (33)**
	Alternative X	No	Negative	Local (2)	Permanent (5)	Moderate (6)	Highly Probable (4)	**Medium (52)**
		Yes	Negative	Local (2)	Permanent (5)	Low (4)	Probable (3)	**Medium (33)**
	Alternative X3	No	Negative	Site (1)	Permanent (5)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Site (1)	Permanent (5)	Minor (2)	Improbable (2)	**Low (16)**
Displacement as a result of disturbance	Alternative B	No	Negative	Site (1)	Short (2)	Low (4)	Improbable (2)	**Low (14)**
		Yes	Negative	Site (1)	Short (2)	Minor (2)	Improbable (2)	**Low (10)**
	Alternative F	No	Negative	Local (2)	Short (2)	Low (4)	Probable (3)	**Low (24)**
		Yes	Negative	Local (2)	Short (2)	Low (4)	Improbable (2)	**Low (16)**
	Alternative X	No	Negative	Local (2)	Short (2)	Low (4)	Probable (3)	**Low (24)**

	Alternatives	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
		Yes	Negative	Local (2)	Short (2)	Low (4)	Improbable (2)	**Low (16)**
	Alternative X3	No	Negative	Site (1)	Short (2)	Minor (2)	Improbable (2)	**Low (10)**
		Yes	Negative	Site (1)	Short (2)	Small (0)	Very Improbable (1)	**Low (3)**
Displacement as a result of habitat transformation.	Corridor 1	No	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Site (1)	Long (4)	Minor (2)	Improbable (2)	**Low (14)**
	Corridor 2	No	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Site (1)	Long (4)	Minor (2)	Improbable (2)	**Low (14)**
	Corridor 3	No	Negative	Local (2)	Long (4)	Moderate (6)	Highly Probable (4)	**Medium (48)**
		Yes	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
Displacement as a result of disturbance.	Corridor 1	No	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Local (2)	Long (4)	Minor (2)	Probable (3)	**Low (24)**
	Corridor 2	No	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Local (2)	Long (4)	Minor (2)	Probable (3)	**Low (24)**
	Corridor 3	No	Negative	Local (2)	Long (4)	Moderate (6)	Highly Probable (4)	**Medium (48)**
		Yes	Negative	Local (2)	Long (4)	Moderate (6)	Probable (3)	**Medium (36)**
Collisions with the earthwire of the 400kV power line.	Corridor 1	No	Negative	Local (2)	Long (4)	Moderate (6)	Highly Probable (4)	**Medium (48)**
		Yes	Negative	Local (2)	Long (4)	Low (4)	Improbable (2)	**Low (20)**
	Corridor 2	No	Negative	Local (2)	Long (4)	Low (4)	Probable (3)	**Medium (30)**
		Yes	Negative	Local (2)	Long (4)	Minor (4)	Very Improbable (1)	**Low (10)**

	Alternatives	Corrective measures	Impact rating criteria					Significance
			Nature	Extent	Duration	Magnitude	Probability	
	Corridor 3	No	Negative	Local (2)	Long (4)	High (8)	Highly Probable (4)	**Medium (56)**
		Yes	Negative	Local (2)	Long (4)	Moderate (6)	Probable (3)	**Medium (36)**
Mitigation Measures Construction activity should be restricted to the immediate footprint of the infrastructure. Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species. Maximum use of existing access roads and the construction of new roads should be kept to a minimum Bird flight diverters must be installed on according to Eskom guidelines.								

7.5.2.4 Biodiversity

The impact assessment of the proposed project identified the following potential negative impacts associated with biodiversity:

- Impacts on vegetation and protected plant species;
- Faunal Impacts During Construction;
- Increased Erosion Risk during operational phase;
- Impact on Critical Biodiversity Areas; and
- Cumulative impacts on broad-scale ecological processes.

The 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.

Operational phase disturbance may result in large amounts of erosion and silt movement into drainage lines with negative consequences for fauna and flora in these areas. Disturbance along the power line route is likely to increase the vulnerability of the disturbed areas to erosion. Impacts associated with the biodiversity were found to be medium without mitigation measures which can be reduced to low after the appropriate mitigation measures.

Table 18: Biodiversity impact ratings per alternatives

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Biodiversity – Impacts on Vegetation and Plant SCC							
Alternative B	No	Negative	Local	Long Term	Low	Probable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Negligible**
Alternative F	No	Negative	Local	Long Term	Low	Probable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Negligible**
Alternative X	No	Negative	Local	Long Term	Low	Probable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Negligible**
Alternative X3	No	Negative	Local	Long Term	Low	Probable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Negligible**
Corridor 1	No	Negative	Regional	Long Term	High	Certain	**Medium**
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**
Corridor 2	No	Negative	Regional	Long Term	Moderate	Highly Probable	**Moderate**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Long Term	Low	Probable	**Low**
Corridor 3	No	Negative	Regional	Long Term	High	Certain	**Medium**
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Biodiversity – Impacts on Fauna During Construction							
Alternative B	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative F	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X3	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Corridor 1	No	Negative	Regional	Long Term	High	Certain	**Medium**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**
Corridor 2	No	Negative	Local	Long Term	Moderate	Probable	**Low**
	Yes	Negative	Local	Long Term	Low	Probable	**Low**
Corridor 3	No	Negative	Regional	Long Term	High	Certain	**Medium**
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Biodiversity – Increased Erosion Risk during Operation							
Alternative B	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative F	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X3	No	Negative	Local	Short Term	Low	Probable	**Low**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Corridor 1	No	Negative	Regional	Long Term	High	Certain	**Medium**
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**
Corridor 2	No	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**
	Yes	Negative	Local	Long Term	Low	Probable	**Low**
Corridor 3	No	Negative	Regional	Long Term	High	Certain	**Medium**
	Yes	Negative	Regional	Long Term	Moderate	Highly Probable	**Medium**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Biodiversity – Impact on Critical Biodiversity Areas and Listed Vegetation Types							
Alternative B	No	Negative	Local	Long Term	Low	Improbable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Low**
Alternative F	No	Negative	Local	Long Term	Low	Improbable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Low**
Alternative X	No	Negative	Local	Long Term	Low	Improbable	**Low**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Long Term	Low	Improbable	**Low**
Alternative X3	No	Negative	Local	Long Term	Low	Improbable	**Low**
	Yes	Negative	Local	Long Term	Low	Improbable	**Low**
Corridor 1	No	Negative	Regional	Long Term	High	Highly Probable	**High**
	Yes	Negative	Local	Long Term	Moderate	Probable	**Moderate**
Corridor 2	No	Negative	Regional	Long Term	Moderate	Highly Probable	**Moderate**
	Yes	Negative	Local	Long Term	Low	Probable	**Low**
Corridor 3	No	Negative	Regional	Long Term	High	Highly Probable	**High**
	Yes	Negative	Local	Long Term	Moderate	Probable	**Moderate**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Biodiversity – Cumulative Impacts							
Alternative B	No	Negative	Local	Short Term	Low	Improbable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative F	No	Negative	Local	Short Term	Low	Improbable	**Low**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X	No	Negative	Local	Short Term	Low	Improbable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Alternative X3	No	Negative	Local	Short Term	Low	Probable	**Low**
	Yes	Negative	Local	Short Term	Low	Improbable	**Low**
Corridor 1	No	Negative	Regional	Long Term	Moderate	Highly Probable	**Moderate**
	Yes	Negative	Regional	Long Term	Moderate	Probable	**Moderate**
Corridor 2	No	Negative	Regional	Long Term	Moderate	Probable	**Moderate**
	Yes	Negative	Regional	Long Term	Low	Probable	**Low**
Corridor 3	No	Negative	Regional	Long Term	Moderate	Highly Probable	**Moderate**
	Yes	Negative	Regional	Long Term	Moderate	Probable	**Moderate**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	

Mitigation measures

- There should be a preconstruction walk-through of the power line route and substation site to identify species of conservation concern that should be avoided;
- Existing roads and access routes should be used wherever possible;
- Avoid development within the High sensitivity parts of the site;
- The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas;
- Avoid impact to potential corridors such as the riparian corridors associated with the larger drainage lines within the area;
- Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person;
- 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;
- Avoid sensitive faunal habitats such as drainage lines and wetlands;
- No pylons should be located within drainage lines or the adjacent floodplains;
- CBAs should be avoided by the final power line route as much as possible, especially where these related to sensitive habitats such as forest or wetlands;
- The options containing the least sensitive vegetation types should be selected;
- Disturbance within or near the drainage lines should be kept to a minimum;
- Any roads along slopes should have water diversion structures placed at regular intervals to ensure that they do not capture overland flow and become eroded; and
- Any erosion problems observed along the power line servitude should be rectified as soon as possible using the appropriate re-vegetation and erosion control works.

7.5.2.5 Eco-Tourism

The impacts of electricity transmission infrastructure on eco-tourism are closely related to the impacts on the surrounding natural environment, upon which ecotourism products rely. The impact assessment of the proposed project identified the potential negative impacts on the environment that will in turn affect the tourism product as follows:

- Clearing of vegetation;
- Disturbance of topographic features of the land;
- Degradation as a result of erosion/loss of top soil; and
- Fauna mortality resulting from powerline strikes.

Ecotourism specialist indicated that construction of a powerline along a freeway or alongside existing powerlines has a much lower relative visual impact than a powerline running through a pristine area without existing "eyesores". In addition, powerline corridor proposed alongside an existing servitude (or where an existing line falls closer to a tourism product than the proposed line) the direct and visual impacts were deemed negligible. The specialist emphasised that Inyaninga corridor 2 is considered to have low impacts as it is closer to the route of existing powerline (Existing_Tx_lines_275kv). The impact significance of the project will be low to medium.

Table 19: Eco tourism impact ratings per alternatives

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Ecotourism							
Alternative B	No	Negative	2	4	2	2	**32**
	Yes	Negative	2	3	2	2	**24**
Alternative F	No	Negative	2	4	2	2	**32**
	Yes	Negative	2	3	2	2	**24**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Alternative X	No	Negative	2	4	2	2	**32**
	Yes	Negative	2	3	2	2	**24**
Alternative X3	No	Negative	2	4	2	2	**32**
	Yes	Negative	2	3	2	2	**24**
Corridor 1	No	Negative	3	5	8	5	**80**
	Yes	Negative	3	4	6	4	**52**
Corridor 2	No	Negative	3	3	4	3	**30**
	Yes	Negative	3	3	2	2	**16**
Corridor 3	No	Negative	3	5	6	4	**56**
	Yes	Negative	3	4	6	3	**39**

Mitigation measures

• The seasonality of the domestic and international tourism markets needs to be taken into account during the construction phase for the proposed projects.

• It is imperative that construction phase/s is strategically selected outside of the peak holiday's season in KwaZulu-Natal, at least around the main tourism nodes identified in this report.

• Make use of existing access roads where possible. Where new access roads are required, disturbance should be minimized by keeping roads narrow and using two-track dirt roads wherever possible.

• Suitable screening should be made available to reduce the visibility of these activities.

7.5.2.6 Wetland

The impact assessment of the proposed project identified the potential negative impacts on the wetland systems as follows:

- Soil compaction leading to erosion, sedimentation and degradation of wetland systems;
- Pollution of wetlands and soil as a result of the construction phase of the project; and
- Disturbance within the wetland systems thereby increasing the encroachment of alien invasive species and the loss of natural habitat for fauna and flora.

The impacts associated with the wetland system would be moderate which can be reduced to low through the application of appropriate mitigation measures.

Table 20: Wetland impacts ratings per alternatives

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Wetland: Soil erosion, sedimentation and degradation within water resource systems							
Alternative B	No	Negative	2	2	8	4	**48 = moderate**
	Yes	Negative	1	2	6	3	**27 = low**
Alternative F	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	4	**36= moderate**
Alternative X	No	Negative	2	2	8	5	**60= high**
	Yes	Negative	1	2	6	4	**36 = moderate**
Alternative X3	No	Negative	2	2	8	3	**36= moderate**
	Yes	Negative	1	2	6	2	**18 =low**
Corridor 1	No	Negative	2	2	8	4	**48 = medium**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	1	2	6	3	**27 = low**
Corridor 2	No	Negative	2	2	8	4	**48 = medium**
	Yes	Negative	1	2	6	3	**27 = low**
Corridor 3	No	Negative	2	2	8	4	**48 = medium**
	Yes	Negative	1	2	6	3	**27 = low**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Inyaninga Wetland: Pollutions of water resources and soil							
Alternative B	No	Negative	2	2	8	4	**48 = moderate**
	Yes	Negative	1	2	4	2	**14 = low**
Alternative F	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	4	3	**21= low**
Alternative X	No	Negative	2	2	8	5	**60= high**
	Yes	Negative	1	2	4	3	**21 = low**
Alternative X3	No	Negative	2	2	8	4	**48= moderate**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
	Yes	Negative	1	2	4	2	**14 =low**
Corridor 1	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	3	**27 = low**
Corridor 2	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	4	4	**28 = low**
Corridor 3	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	4	4	**28 = low**
Inyaninga Wetland Alien invasive species							
Alternative B	No	Negative	2	2	8	4	**48 = moderate**
	Yes	Negative	1	2	6	3	**27 = low**
Alternative F	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	4	**36= moderate**
Alternative X	No	Negative	2	2	8	5	**60= high**
	Yes	Negative	1	2	6	4	**36 = moderate**
Alternative X3	No	Negative	2	2	8	4	**48= moderate**
	Yes	Negative	1	2	6	3	**27 =low**

Alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Corridor 1	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	4	**36 = low**
Corridor 2	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	4	**36 = moderate**
Corridor 3	No	Negative	2	2	8	5	**60 = high**
	Yes	Negative	1	2	6	4	**36 = low**

Mitigation Measures

- The enforcement of the buffer and the placement of towers outside wetland systems will significantly reduce the impact on the wetlands;
- Areas which have been disturbed will be quickly colonised by invasive alien plant species;
- All waste generated during construction is to be disposed of at an appropriate facility and no washing of paint brushes, containers, wheelbarrows, spades, picks or any other equipment adjacent to the watercourses is permitted;
- The creation of access roads must take all wetlands and watercourses into consideration and these systems must be avoided;
- All disturbed areas must be rehabilitated as soon as construction in an area is complete or near complete and not left until the end of the project to be rehabilitated;
- Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 100m of the delineated water resources;
- No release of any substance i.e. cement, oil, that could be toxic to fauna or faunal habitats within the watercourses; and
- Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately; and disposed at solid/hazardous waste facilities (not to be disposed of within the natural environment); and
- Any contaminated soil must be removed and the affected area rehabilitated immediately.

7.5.3 GENERAL CUMULATIVE IMPACTS

7.5.3.1 Waste generation

During the construction phase there will be a variety of waste material produced.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	2	2	8	5	60 Medium
	Yes	Negative	1	2	4	4	28 Low
Mitigation measures	• No waste will be buried on site or incorporated into the foundation trenches. • The work force must be encouraged to sort waste into recyclable and non-recyclable waste. • No burning of waste will be allowed on site. • Waste must be regularly removed from site and disposed of at a registered waste disposal facility.						

7.5.3.2 Socio-economic impact

The proposed development will result in a positive socio-economic impact as the demand for equipment, building material and labour will increase. Secondary service provision such as food supply, toilet hire, equipment maintenance etc. would also stimulate the local economy especially during the construction phase.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Socio-economic impact	No	Positive	3	2	8	5	65 Medium
Mitigation measures	• Contractors must by all means practice the localisation matrix while seeking for construction equipment or building materials. • For minimal jobs, the appointed contractor should by all means consider the local residents for jobs that do not need any skill transfer. • The culture and lifestyles of the communities living in close proximity to the proposed development must be respected;						

7.5.3.3 Visual Impact

The proposed activity will change the visual character of the area particularly considering that the proposed site is located next to major roads (N2 and R102). Given the undulating topography of the site and the proximity to these routes, the impact can be considered definite and long term. Cumulative impact may be lower than anticipated due to existing power lines and substation. A visual impact study will be conducted during the EIA phase.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Visual impact	No	Negative	2	4	8	5	70 High
	Yes	Negative	2	4	6	3	36 Medium
Mitigation measures	• Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance; and • Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height.						

7.5.3.4 Traffic Impact

During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Traffic	No	Negative	3	2	8	3	39 Medium
	Yes	Negative	2	2	6	2	20 Low
Mitigation measures	• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads. • Access roads must be clearly marked. • Delivery vehicles must comply with all traffic laws and bylaws.						

Based on specialist findings and the assessment of impacts by the EAP, site alternatives B, F, X and X3 are actively used for the cultivation of sugarcane. With reference to aquatic ecology specialist and all the findings, alternative Site F is the least preferred. Nonetheless, from the EAP perspective, Alternative Sites B, F, X and X3 are viable for the proposed development. However, with reference to aquatic ecology, heritage, wetland, agricultural potential and biodiversity specialists, the most preferred alternative site is X3. This site has lower potential impacts according to

the above mentioned specialists. Furthermore, based on specialist findings and the assessment of impacts by the EAP, corridor two is the most preferred compared to corridor 1 and 2.

7.6 METHODOLOGY FOR ASSESSING SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria given in the tables below will be used to conduct the evaluation. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance and probability of occurrence attached to it. This will be assessed in detail during the EIA phase.

Table 21: Methodology used in determining the significance of potential environmental impacts

Status of Impact
The impacts are assessed as either having a:
negative effect (i.e. at a `cost' to the environment),
positive effect (i.e. a `benefit' to the environment), or
Neutral effect on the environment.

Extent of the Impact
(**1**) Site (site only),
(**2**) Local (site boundary and immediate surrounds),
(**3**) Regional (within the City of Johannesburg),
(**4**) National, or
(**5**) International.

Duration of the Impact
The length that the impact will last for is described as either:
(**1**) immediate (<1 year)
(**2**) short term (1-5 years),
(**3**) medium term (5-15 years),
(**4**) long term (ceases after the operational life span of the project),

(**5**) Permanent.

Magnitude of the Impact
The intensity or severity of the impacts is indicated as either:
(**0**) none,
(**2**) Minor,
(**4**) Low,
(**6**) Moderate (environmental functions altered but continue),
(**8**) High (environmental functions temporarily cease), or
(**10**) Very high / Unsure (environmental functions permanently cease).

Probability of Occurrence
The likelihood of the impact actually occurring is indicated as either:
(**0**) None (the impact will not occur),
(**1**) improbable (probability very low due to design or experience)
(**2**) low probability (unlikely to occur),
(**3**) medium probability (distinct probability that the impact will occur),
(**4**) high probability (most likely to occur), or
(5) Definite.

Significance of the Impact
Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.
S=(E+D+M)P

The significance ratings are given below
(**<30**) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
(**30-60**) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
(**>60**) high (i.e. where the impact must have an influence on the decision process to develop in the area).

7.7 PLAN OF STUDY FOR EIA

The Scoping phase is fundamental as it allows for the identification of potential impacts on the environment, as well as facilitation of the process of compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews as well as previous environmental studies conducted in the area; it therefore, provides a comprehensive baseline of the environment at the proposed site.

This Scoping Process has followed the appropriate standards and procedure for the EIA application, as set out in the NEMA, as amended, and the EIA Regulations. The study includes a description of the various alternatives and

indicates those alternatives, which should be pursued as part of the detailed assessment of the EIA process. Impact significance of the proposed activity on the environment will be assessed in the EIA phase with the assistance of the various specialist studies.

The purpose of this section is to outline how the EIA for the proposed development will proceed during EIA phase. The detailed assessment phase of the EIA process entails the integration of the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMPr. This section provides specific terms of reference and impact assessment methodology for utilisation by the specialist team and EAP.

The Plan of Study for EIA is intended to provide a summary of the key findings of the Scoping Phase and to describe the activities to be undertaken during the impact assessment. The Plan of Study must provide the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- A description of the aspects to be assessed as part of the environmental impact assessment process;
- Aspects to be assessed by specialists;
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- A description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- Particulars of the public participation process that will be conducted during the EIA process;
- A description of the tasks that will be undertaken as part of the environmental impact assessment process; and
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The EAP will ensure that the entire process is undertaken as dictated by the Regulations.

7.7.1 A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY

The scoping phase assessed technical, site, route and structural alternatives. These alternatives will be assessed further during the EIA. The preferred site will be the site with the least environmental impacts as well as providing most benefits to the socio-economy.

7.7.1.1 Site

The sites to be assessed further during the EIA include substation alternative Sites B, F, X, X3 and the No-Go Alternative.

7.7.1.2 Corridor alternatives of the proposed powerlines

The sites to be assessed further during the EIA include all three corridors and the No-Go Alternative.

7.7.1.3 Technical

Two technical alternatives have been identified for the proposed project i.e. the overhead powerline and underground cabling.

7.7.1.4 Structural

Structural design alternatives include the following:

- Cross-Rope suspension type;
- Self-supporting type; and
- Guyed V towers.

7.7.2 A DESCRIPTION OF THE ASPECTS TO BE ASSESSMENT AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The following are the aspects to be assessed as part of the EIA:

- Agriculture;
- Biodiversity (flora and fauna);
- Avifauna;

- Water resources;
- Heritage and archaeology;
- Aesthetics;
- Noise;
- Tourism;
- Access;
- Waste management;
- Traffic; and
- Socio-economics.

7.7.3 ASPECTS TO BE ASSESSED BY THE SPECIALISTS

Specialist studies that were undertaken as part of the study include agricultural potential, biodiversity, heritage, wetland, aquatic ecology and avifauna studies and the reports are attached herein. The studies undertaken during the scoping phase assessed all the seven alternative sites and will continue with four alternative sites as well as the No-go option during the EIA phase.

7.7.4 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS, INCLUDING ASPECTS TO BE ASSESSED BY THE SPECIALISTS

The proposed method of assessing environmental aspects is indicated on Section 7.6, Table 16 above.

7.7.5 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING DURATION AND SIGNIFICANCE

The description of the proposed method of assessing the duration and significance is included on Section 7.6 and presented in a form table. .

7.7.6 AN INDICATION OF THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

Figure 25 below indicates the different stages at which the Competent Authority will be consulted.

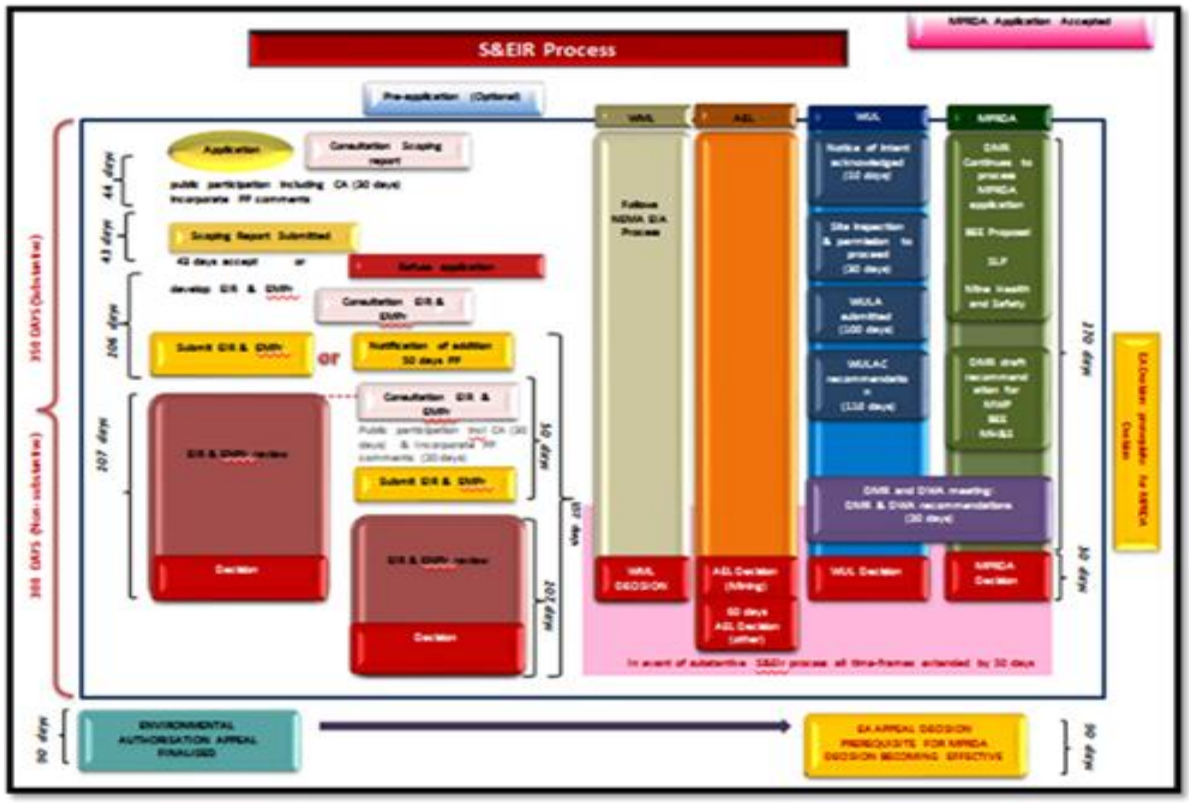

Figure 25: Stages for submitting the reports to the Competent Authority

7.7.6.1 Scoping Phase

The draft Scoping Report together with the Application will be submitted to DEA for review and comment. The EAP will consider the comments and prepare responses. In addition, the report will be sent to all stakeholders to review and comment, of which any comments or issues raised, will be addressed appropriately. The final Scoping Report will be submitted to the DEA for consideration.

7.7.6.2 Environmental Impact Assessment Phase

The draft Environmental Impact Assessment Report will be prepared and distributed for public review and comments. Further, copies of the draft EIA will be submitted to the DEA and other stakeholders as well as the final EIR which includes all comments received, specialist reports and recommendations will be submitted to DEA for decision making.

Particulars of the public participation process that will be conducted during the environmental impact assessment process

The extensive database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIA Report for review and will be given 30 days to provide their comment.

The comments received will be incorporated into an updated Comments & Response Report. Further public consultation will take place in the form of Public meetings and focus group meetings as appropriate.

The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development.

In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made to the report. The Final EIA Report will be submitted to the DEA, subsequent to the second phase of public consultation

7.7.7 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The extensive database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the Draft EIA Report for review and will be given 30 days to provide their comment.

The comments received during the review period will be incorporated into an updated Comments & Response Report. Further public consultation will take place in the form of public meetings and focus group meetings as appropriate.

The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development.

In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made and the final EIA Report will be submitted to the DEA, subsequent to the second phase of public consultation.

7.7.7.1 Advertising

The commencement of the EIA process i.e. the Scoping Phase was advertised in local newspapers in English and isiZulu. The proposed project was further announced publicly through the following forms of information sharing:

- Newspaper adverts providing a description of the proposed development and location, as well as contact details of where more information can be obtained and announcing the availability of the draft Report for review and comment;
- A2 and A3 notices were placed at conspicuous locations around the proposed alternative sites as well as at the local municipalities offices;
- A5 notices were distributed in the immediate vicinity of the development; and
- Letters were submitted to key stakeholders.

Further advertising will take place during the EIA phase and will relate to the availability of the reports for public review and announcement of public meetings that will be held at strategically located sites, which will allow for maximum attendance.

7.7.7.2 Interaction with DEA and Provincial Departments

Interaction with DEA and the other provincial authorities with jurisdiction on the proposed development were undertaken during the Scoping Phase and will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the Final Scoping Report to DEA;
- A consultation meeting with various stakeholders and I&APs as appropriate, to discuss the findings of the Draft EIA;
- Submission of the final EIA report, following a public review period; and
- Notification of registered I&APs of the EA once it is issued.

The draft EIR will be reviewed by I&AP's, authorities and key stakeholders. The Report will be submitted to various government departments and stakeholders including:

- EThekwini Metropolitan Municipality;

- South African Heritage Resource Agency;
- KwaZulu-Natal Department of Transport and Public Works;
- KwaZulu-Natal Department of Water and Sanitation;
- Wildlife and Environmental Society of South Africa;
- KwaZulu-Natal Department Economic Development, Tourism and Environmental Affairs;
- National Department of Environmental Affairs; and
- National Department of Water and Sanitation.
- Registered Interested & Affected Parties; and
- Department of Water and Sanitation.
- Further, the Report will be made available on Nsovo website.

7.7.7.3 Developing a Strategy and Resolving Key Issues

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out;
- Use of the Public Participation Meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- Openly and honestly relating both positive and negative impacts of the proposed development during the Public Meetings; and
- Allowing the public to understand the consequences of the proposed development on the area.

7.7.8 A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The section below indicates the tasks that will be undertaken as part of the EIA process.

7.7.8.1 Preparation of the draft EIA Report and EMPr

The draft EIA Report and EMPr will be prepared as per Appendices 3 and 4 of the 2017 EIA Regulations and will include input from the specialist studies as indicated in Section 7.7.3 above.

Contents of the draft EIR (Appendix 3) will include the following:

- Details and expertise of the EAP;
- Location of the Activity;

- A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity;
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity;
- An assessment of each identified potentially significant impact and risk including (i) and (vii) as per the Regulations;
- A summary of the findings and recommendations of specialist reports;
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations;
- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
- The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;
- A description of any assumption, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- The period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;
- The undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations;
- An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations;

Contents of the EMPr (Appendix 4) will include the following:

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including (i) to (v) of the EIA 2017 Regulations;
- A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated on (i) to (iv) of the EIA 2017 Regulations.
- The method of monitoring the implementation of the impact management actions contemplated above;
- The frequency of monitoring the implementation of the impact management actions contemplated above;
- An indication of the persons who will be responsible for the implementation of the impact management actions;
- The time periods within which the impact management actions contemplated above must be implemented;
- The mechanism for monitoring compliance with the impact management actions contemplated above;
- A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;
- An environmental awareness plan describing the manner in which-
- (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
- (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- Any specific information that may be required by the competent authority.

7.7.8.2 Public Participation Process

The draft EIA Report will be distributed to I&APs as well as the Organs of State for a 30 days review and comments period. Various means of notifying the I&APs of the availability of the draft EIA Report will be used and this include

newspaper advert, e-mails, letters etc. The public participation process will be undertaken as indicated on Section 7.7.7 above.

7.7.8.3 Preparation of the final EIA Report and EMPr

The final EIA Report and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations, further, it will be submitted to DEA in hard copy and electronic version (CD) and will include the following:

7.7.9 IDENTIFY SUITABLE MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED

The aspects that will be assessed have been identified and their potential impacts and mitigation measures are indicated on Sections 7.5.1 and 7.7.2. The proposed method of assessing environmental aspects is included on Section 7.6, Table 17 above.

8 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

In undertaking the draft and final Scoping phases of the project the EAP has taken into consideration the requirements stipulated in the EIA Regulation of April 2017 as amended, as well as other relevant Acts and Regulations. The EAP hereby confirm that with the information available at the time of preparing the Scoping Report and the reports prepared by the specialists, the following has been taken into account in preparing this report:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and interested and affected parties; and
- Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to **Appendix E2** for the Declaration of the EAP.

9 AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT

The draft Plan of Study was part of the draft Scoping Report which was made available to I&APs and Organs of State for a 30 days review and comment period. Comments/issues raised have been addressed and are included in the Issues and Response Report (**Appendix D4**).

No agreement between the EAP and I&APs is in place.

10 WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

The information required by the authority and is currently available, has been included in this draft Scoping Report

11 ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (a) AND (b) OF THE ACT.

This Report has been prepared in terms of NEMA, its respective 2014 EIA Regulations as well as other various Acts. Information that is required by the NEMA has been included in the Scoping Report and will also be included in the EIA phase.

12 CONCLUSION

The Scoping study was undertaken as dictated by the NEMA and the EIA Regulations of April 2017 as well as associated Regulations.

The site alternatives have been proposed and the primary objective was to assess the suitability of each site for the intended use as well as to assess the impacts of the proposed development i.e. the Inyaninga substation and associated loop in and loop out power lines on the environment. This report has comprehensively addressed the baseline environment which will form the backdrop of the impact assessment. Information provided has been supported by specialist studies that were undertaken and attached hereto.

Fatal flaws

No fatal flaws or highly significant impacts were identified during the scoping phase that would necessitate substantial redesign or termination of the project. The main impacts are outlined below, and recommended mitigation measures and a summary of site suitability and residual impacts will further be assessed in detail during the EIA phase. Such potential impacts include the following:

- Impacts on agriculture;
- Impacts on flora and fauna;
- Impacts on avifauna;
- Impacts on water resources;
- Impacts on heritage and archaeology;
- Impact on aesthetics;
- Impact on noise;
- Traffic impact; and
- Impact on tourism.

The subsequent EIA phase will provide a detailed assessment of the identified aspect, rate the significance accordingly and propose mitigation measures as applicable.

13 REFERENCES

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