

DOCUMENT QUALITY CONTROL

CLIENT: ESKOM HOLDINGS SOC LIMITED

PROJECT: PROPOSED FOSKOR MERENSKY 275KV ±130KM LINE AND ASSOCIATED SUBSTATION WORKS

DOCUMENT: FINAL SCOPING REPORT

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Executive Summary

The current existing Eskom network has reached its capacity and will not be able to accommodate the expected load growth in the coming years. The existing Foskor Merensky 275kV line contingency is currently causing under voltages at the Foskor and Acornhoek substations which will worsen in the next year and deteriorate to voltage collapse as more load connects to the network.

Consequently Eskom plans to strengthen the existing network by constructing a second Foskor Merensky 275kV ±131km power line and associated substation works. The proposed project offers a solution that will improve and strengthen the current supply to cater for future developments.

The proposed project will stretch over a distance of ±131km on various farms between Phalaborwa and Steelport in the jurisdiction of Greater Sekhukhune, Capricorn and Mopani District Municipality in the Limpopo Province. The load centre in question is predominantly driven by mines and rural development.

The motivation for the proposed is as follows:

- The power lines will form part of the link to strengthen the supply network between Foskor and Merensky.
- Improvement in the reliability of electricity supply which will benefit users in the region and country at large.
- Subsequently improve the Economic status of the country.
- The beneficiaries of the proposed project will primarily be industries, mining houses as well as households in the region.

One of the key drivers towards a successful EIA is the thorough identification and investigation of feasible alternatives. The selection of potential alternatives will be informed by input received from the I&APs, authorities as well as the EAP. Alternatives have been considered and discussed in terms of their practicality and feasibility. It is important to note that the definition of alternatives includes all aspects of the proposed activity including, activity alternatives, process alternatives, scheduling alternatives, demand alternatives; design alternatives and the No-go alternative. The project has considered various technical options of which the proposed was found to be technically, economically and environmentally viable when compared to the other options. The proposed project also considered several route alternatives which will be scrutinized further throughout the project.

In accordance with the requirements of the NEMA, Eskom requires approval from the Competent Authority i.e. the Department of Environmental Affairs in order to undertake the proposed project. The proposed project is listed under GNR 545 (Listing Notice 2), Activity number 8 as an activity that cannot proceed without approval. Therefore this report forms part of the Scoping process which aims to provide the relevant authority, with information regarding the proposed project and its potential impacts on the environment. The report shall detail the baseline information which will form the backdrop on which the assessment of potential impacts on the environment shall be based.

The objectives of the scoping exercise are to:

- Facilitate approval of the project in terms of the requirements of regulations 22 (2) (a) of the regulations published in the GN R543 of 2010.
- Meet the directives and guidelines for the implementation of sections 24(5), read with section 44 of the NEMA.
- Find mechanisms for addressing issues raised during the Public Participation Process (PPP) as per the requirement of Section 54 of the NEMA.
- Evaluate concerns and assess potential fatal flaws.
- Provide information to the authorities as well as interested and affected parties on the proposed project.
- Provide information regarding alternatives that are being considered.
- Indicate how interested and affected parties have been and are still being afforded the opportunity to contribute to the project, verify that the issues they raised to date have been considered, and comment on the findings of the impact assessments.
- Describe the baseline receiving environment.
- Define the Terms of Reference (ToR) for specialist studies to be undertaken in the Impact Assessment Phase of the EIA.
- Present the findings of the Scoping Phase in a manner that facilitates decision-making by the relevant authorities.

The primary objective of the EIA process is to ensure that potential impacts (both positive and negative) are identified following which management and mitigation measures will be recommended. The Scoping phase of the EIA process has identified environmental issues that will be further assessed during the EIA phase of the project.

The key issues identified during the Scoping process, and to be assessed in detail during the EIA phase are as follows:

- Impact on the Socioeconomic;
- Impacts on fauna and flora fauna;

- Impacts on heritage and archaeology;
- Visual Impact; and
- Impact on Avifauna.

Preliminary alternatives have been identified and will be assessed further during the EIA phase. Should any other feasible alternatives come into play throughout the EIA process, such will be assessed further.

The report has been compiled in compliance with the requirements of the NEMA as well as associated regulations and sub regulations.

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GLOSSARY OF TERMS AND ACRONYMS

DEA	Department of Environmental Affairs and Tourism
DEDET	Department of Economic Development Environment and Tourism
DWA	Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EIMP	Environmental Impact Management Plan
EIR	Environmental Impact Report
ESKOM	Eskom Holdings SOC Limited
GPS	Global Positioning System
HIA	Heritage Impact Assessment
IAPs	Interested and Affected Parties
IEM	Integrated Environmental Management Process
IRR	Issues Response Report
kV	kilo Volts
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
PPP	Public Participation Process
ROD	Record of Decision
SAHRA	South African Heritage Resources Agency
SIA	Social Impact Assessment

1. INTRODUCTION

Eskom proposes to construct the proposed Foskop- Merensky 275kV ±131km Line and associated substation works. In accordance with the requirements of the NEMA and associated regulation, Eskom is in the process of applying for Environmental Authorisation (EA) from the competent authority for the proposed project through the undertaking of an Environmental Impact Assessment (EIA) as prescribed in Chapter 3 of GNR 543 of the EIA regulations, 2010.

The proposed activity is a listed activity under GN R. 545 of the EIA Regulations, 2010, Activity No.8 (i.e.: The construction of facilities or infrastructure for the transmission and distribution of the electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex); other associated listing are included in the application. This listing dictates that a full EIA be undertaken, which includes the Scoping and the Impact Assessment phases with full consultation with the commenting authorities and Interested and Affected Parties (I&AP).

This report forms part of the Scoping process which aims to provide the relevant authority, which in this case is the Department of Environmental Affairs (DEA) with information regarding the proposed project and its potential impacts on the environment. The report shall detail the baseline information which will form the backdrop on which the assessment of potential impacts on the environment shall be based.

For this particular project, the proponent (or applicant) is Eskom Holding SOC (Eskom) Limited, the decision-maker is the DEA and the independent consultant is Nsovo Environmental Consulting (herein after referred as Nsovo). I&APs are individuals or groups who are concerned with or who may be affected by the project and its consequences; these include government and municipal authorities, local residents, community groups and the general public.

2. DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONERS (EAP)

Nsovo Environmental Consulting has been appointed by Eskom to be the independent consultants for the proposed project. Below are the details of the EAP responsible for the project as well as their qualifications and related expertise.

Nsovo is conversant with the definition of an Environmental Assessment Practitioner (EAP) as defined in regulation 17 of the EIA regulations promulgated in June 2010 in terms of the National Environmental

Management Act ([NEMA] No 107 of 1998) which became effective on 2 August 2010. This includes, *inter alias*, the requirement that Nsovo is:

- Objective and Independent;
- 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: Details of the EAP

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Postal Address	P/Bag x29, Postnet Suite 696 Gallo Manor 2052
Telephone Number	071 602 2369
Fax Number	086 602 8821
Email	munyadzi@nsovo.co.za
Qualifications & Experience	<ul style="list-style-type: none"> • BSc Honours in Environmental Management obtained from University of Johannesburg in 2004 • BSc in Geography and Archaeology obtained from Wits University in 2003 • Certificate in Project Management obtained From UNISA in 2007 • 8 years of experience
CV	Please find World bank CV attached
Project Related Expertise	<p>In terms of project related expertise the EAP has completed the following projects:</p> <ul style="list-style-type: none"> • EIA for the proposed Westgate DS 132Kv Randfontein Strategic Servitude • Basic Assessment for Simmerpan Strengthening • EIA for the proposed Wildebees infeed Station and associated power lines. • Basic Assessment for Marula Substation • Basic Assessment for Craighall Benmore

	88kv Cable <ul style="list-style-type: none"> • EIA for Wildebees Infeed Station and Associated loop in lines
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3. DESCRIPTION OF THE PROPOSED ACTIVITY AND OF ANY FEASIBLE ALTERNATIVES

3.1. BACKGROUND

The existing Eskom network has reached its capacity and will not be able to accommodate the expected load growth in the coming years. The existing Foskop- Merensky 275kV line contingency causes under voltages at the Foskop and Acornhoek substation, which will worsen in the coming years and deteriorate to voltage collapse as more load connect to the network.

Consequently Eskom plans to strengthen the existing network by constructing a second Foskop- Merensky 275kV ±130km power line and associated substation works, which is the project in question. The proposed project offers a solution that will improve and strengthen the current supply to cater for the future developments.

3.2. PROPOSED SCOPE OF WORK

- Upgrading the Foskop 275/132kV transformation by installing a 3rd 250MVA275/132Kv
- Establish a spare 275kV feeder bay at Merensky MTS to create space for the proposed 2nd Merensky-Foskop 275kV line
- Install and equip 1x 275kV feeder bay for the proposed 2nd Merensky-Foskop 275kV line at Foskop Substation Construct the 2nd Foskop–Merensky 150km Kingbird 275kV line
- Equip and commission all new infrastructures with all associated primary and secondary plant equipment.
- Upgrade under-rated switchgear at Merensky Substation
- Install Capacitor Bank at Foskop Substation
- Extend Foskop Substation to accommodate all the work associated with the new power line.
- Relocation of Acornhoek-Foskop terminal tower to accommodate the new power line
- Relocation of the existing oil holding dam to accommodate the new power line

3.3. MOTIVATION FOR THE DEVELOPMENT

As part of the long term solution, Eskom have undertaken a series of projects to upgrade the existing electricity infrastructure and to construct new infrastructure where there is a need in the country, of which the proposed project forms part of the new infrastructure that Eskom has planned. The Foskop-Merensky load centre is driven by mines and rural development.

The proposed project will ensure the following:

- The power line will form part of the link to strengthen the supply network between Foskop and Merensky Substations.
- Improvement in the reliability of electricity supply which will benefit users in the region and country at large.
- Improve the economic status of the country.

3.4. BENEFITS OF THE PROJECT

The proposed project is beneficial as it will allow for load growth in the region. At the **local** level, the benefits of the project would centre on ensuring improved reliability of supply as well as entrench the reach of electricity into communities. It is envisaged that the proposed project would ensure that marginal communities in the region are supplied with electricity. This will indirectly have an added benefit as it may reduce the community's reliance on firewood as their primary energy source, thus allow for sustainable livelihoods.

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 such as:

For organs of state:

- Electrification of educational and training facilities (schools and the like).
- Electrification of health facilities (clinics, hospitals and the like).
- Electrification of security facilities (police stations, court houses and the like).
- Electrification for the provision of essential services (water supply pumps and the like).
- Electrification of religious and cultural facilities.
- Enables rural development.
- Enables the provision of lightning, thereby vastly improving the safety and security of communities.

For individuals and communities:

- Electrification of homes (for cooking, heating and lighting of homes which improves the lives of the individuals within the home).
- Encourages small and medium enterprise development, and as a result, contributes to a rise in disposable income.

From an ecological perspective, the availability of electricity can lead to a decrease in the harvesting of firewood with resultant biodiversity benefits. This also leads to a decrease in respiratory disease due to a reduction of biomass burning. The relative efficiency of using electricity will reduce overall air emissions and can lead to an improved quality of life.

The anticipated benefits of the proposed transmission and distribution lines will be further discussed in detail through the Socio-Economic Assessment to be undertaken during the EIA phase.

3.4.1. 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 municipalities on the lead 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 promoting electrification and off-grid power supply.

3.5. CONSIDERATION OF ALTERNATIVES

The identification of alternatives is an important component of the EIA process. The various identified alternatives will be assessed in terms of both environmental acceptability as well as technical and economic feasibility during the EIA process wherein the preferred option will be highlighted and presented to the authorities.

Five route alternatives are being considered for the proposed project including the no-go alternative, however only four have been assessed including the no go option. Three kilometre buffer will be assessed on all the options within which a 47m servitude will be utilised. The project has considered various technical options of which the proposed were found to be technically, economically and environmentally

viable compared to the other options. The four alternatives will be presented during the scoping and scrutinised further during the EIA. Some alternatives may be eliminated after the Scoping Phase.

3.5.1. Technical Alternatives

Instead of constructing the proposed line above ground, underground construction can be an alternative. The advantages of this alternative would include minimisation of the impact on land use, reduced impact on bird interaction and a distinct visual impact benefit.

Unlike aboveground cables 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. But on larger lines the methods of electrical and heat insulation becomes more onerous.

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.

Faulting on underground cable is rare. Bush fires, lightning strikes and bird related faults make up 80% of faults on overhead transmission lines in South Africa. These are not risks associated with underground cables. When such 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. On underground cables the faults are almost exclusively a permanent fault, requiring inspection and correction on site. This usually requires excavating a section of the line. However, 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 design standard.

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 cables. Underground 132kV is 3 to10 times more expensive than overhead lines. The mark up for 'undergrounding' is therefore significant. There is not much expertise for high voltage underground cabling in the country therefore 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’s harder to find the faults, and therefore the outages last much longer. The lifespan of underground cables is reported to be much shorter, about half that of overhead cables

3.5.2. Structural Alternatives

Two design alternatives have been proposed for this project, the Cross-Rope suspension type and the Self-supporting type. These are illustrated in Figure 4-1 and Figure 4-3. It is important to note that the topography will largely dictate the type of tower that will be used. From this perspective, it should be noted that where the line crosses mountainous terrains and when it changes direction at an angle, there may be need to use self-supporting towers. Narrow base towers may be utilised on sections where space is a problem. These are illustrated in Figure 4-2.

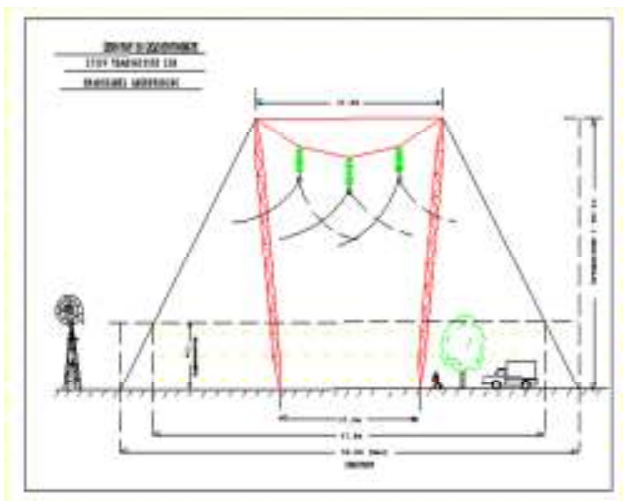


Figure 1: Cross Rope

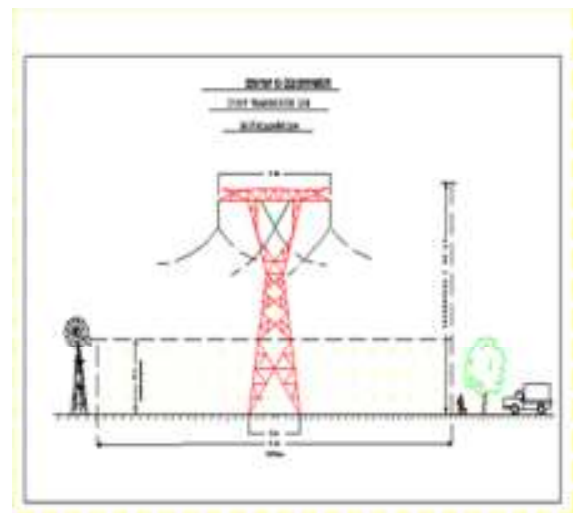


Figure 2: Self Supporting tower

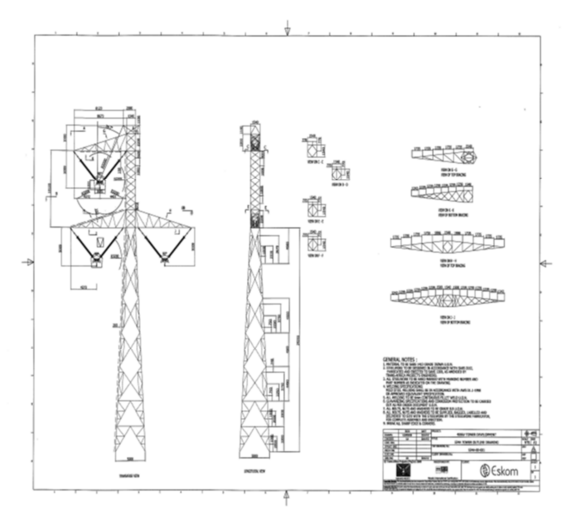


Figure 3: Narrow base tower

3.5.3. Route Alternatives

Alternative 1 (Green Route)

This line will loop out of the existing Foskop substation in Phalaborwa in a South Westerly direction along the secondary Road 530 towards Mica. It crosses the R40 and continues towards the same direction within the Phuza Moya Game Farm. It then passes within the Diphuti and Finale villages in Maruleng and then cross the R36 towards the Orchards. Shortly after that it crosses the R36 twice then continues in the mountainous areas that are prone to lightning. After the mountainous areas the line descends in a south-westerly direction towards the low lying Burgersfort villages until it passes the R37 to Burgersfort town where it continues along the Secondary Road 555 to Steelpoort, which it eventually crosses and enters the substation.

This line has approximately 15 bends and it crosses river sensitive zones approximately 7 times. The route stretches an area of sensitive flora and important bird species for approximately 15km.

Alternative 2 (Blue Route)

The line loops out of the existing Foskop substation in Phalaborwa in a North Easterly direction; for approximately 5km, it bends westward for another 5km and then bends southward towards Hoedspruit following the existing 132kV line. Just before Hoedspruit town it crosses the R40 and bends westwards and moves between the existing 275kV and secondary road 527 on the eastern side of Diphuti and Finale villages. It then cross the secondary road 531 and head for the mountainous area that are lightning prone. After the mountainous areas the line descends towards the low lying Burgersfort villages until it passes the R37 to Burgersfort town where it continues along the Secondary Road 555 to Steelpoort, which it eventually crosses and enters the substation.

This line has approximately 23 bends and it crosses river sensitive zones approximately 5 times. The route stretches over an area of sensitive flora and important bird species for approximately 20 km.

Alternative 3 (Pink Route)

This line will loop out of the existing Foskop substation in Phalaborwa in a North Easterly direction along the secondary Road 530 towards Mica. It crosses the R40 and continues towards the same direction within the Phuza Moya Game Farm. It then passes within the Diphuti and Finale villages in Maruleng and then cross the R36 towards the Orchards. Shortly after that it crosses the R36 twice then continues in a southerly direction along the R36 in the mountainous areas that are lightning prone. After the mountainous areas the line descends in a southerly direction towards Orighstad along a river and bends westwards along the secondary road 555 pass Kromkloof and Burgersfort until it enters the Merensky substation in Steelpoort.

This line has approximately 26 bends and it crosses river sensitive zones approximately 6 times and stretches a long distance along river sensitive zones. The route stretches over an area of sensitive flora and important bird species for approximately 15 km

Alternative 4 (Yellow Route)

This line will loop out of the existing Foskop substation in Phalaborwa in a Northerly direction and bends towards a North-westerly direction along the secondary road 530 it passes the R40 15km before Mica and transverses villages and farmlands until it crosses the R36, it continues in the mountainous areas towards Penge a class 2 town in the western side of the study area. From Penge it bends southwards passing the R37 to Burgersfort and enters the Merensky substation on the Western side.

This route stretches for a long distance in mountainous areas, and crosses river sensitive zones 4 times. The route transverses areas of sensitive flora for a distance of approximately 50km.

3.5.4. No-Go Alternative

In accordance with GNR 543, consideration must be given to the option not to act. This option is usually considered when the proposed development is envisaged to have such 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 construction of the proposed project. It will imply no improvement in reliability of electricity systems which would benefit electricity users in the various municipalities, the region and country at large. Should it be adopted the municipalities and communities will be deprived of a much needed essential service/facility, particularly given the already existing problem with energy supply in the country.

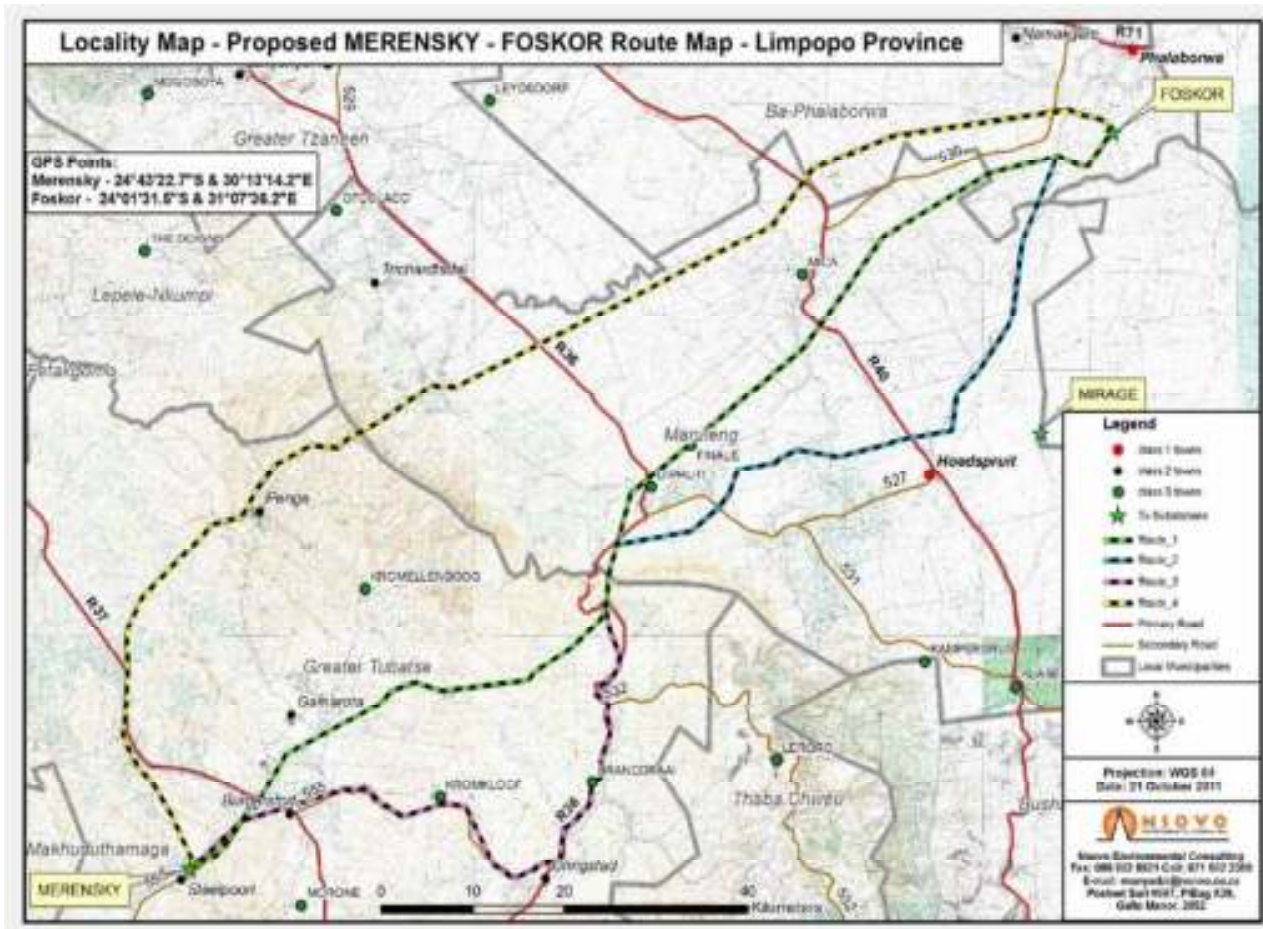


Figure 4: Proposed Site Map

3.6. ACTIVITIES ASSOCIATED WITH THE PROJECT

The construction phase of the proposed project will take up to 18 months and activities included are discussed hereunder:

3.6.1. Corridor walk-down:

The primary objective is to ensure that all sensitive areas are avoided and where need be buffers are created for conservation purposes. Furthermore the walk down aims to establish the exact coordinates for the establishment of the pylons.

3.6.2. Construction Camps

The need and exact locality for construction camps will be assessed in the Site Specific EMP.

3.6.3. Vegetation clearance

A 47 metre servitude is required for the proposed 275Kv power line; tall trees will be cleared along the entire length of the servitude (the vegetation will also be maintained by Eskom in the operational phase of the project).

3.6.4. Pylon footings

The civil works comprises of the setting out and construction of the concrete plinth to support the electrical apparatus that will be installed. Foundations will be laid for the footings of the pylons.

3.6.5. Steelwork structures

The pylons will be erected in segments.

3.6.6. Stringing

Once the pylons have been erected, conductors will be threaded between the pylons.

3.6.7. Feeder bays

Feeder bays will be erected in the existing footprint of the Foskor and Merensky Substations in Phalaborwa and Steelpoort respectively.

Since the proposed power line will be approximately 130 km in length, the aforementioned tasks may occur simultaneous along the power line corridor.

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

The proposed 275kV Foskor Merensky power line stretches a distance of approximately 130 kilometres across various farms between Phalaborwa and Steelpoort in the jurisdiction of Greater Sekhukhune, Capricorn and Mopani District municipalities in the Limpopo Province of South Africa.

The lines will furthermore transverse various farms, predominantly game farms that are privately owned as well as tribal authorities and council owned land. The details of the properties on which the proposed activity is to be undertaken is attached as Annexure B8 which includes details of game farms, tribal authorities and municipalities.

The proposed alternatives transverses the following towns:

- Class 1 town - Phalaborwa and Hoedspruit
- Class 2 towns – Gamarota, Burgersfort, Orighstad and Steelpoort
- Class 3 towns – Diphuti, Finale, Mica, Kromkloofand Brandraai

4.1. LOCAL AUTHORITY

The proposed development falls within the jurisdiction of various municipalities in the Limpopo Province and this includes:

- Ba-Phalaborwa Local Municipality
- Maruleng Local Municipality
- Greater Tubastse
- Lepelle Nkumpi
- Fetakgomo Local Municipality

The above listed municipalities are located within three main district municipalities namely:

- Sekhukhune
- Capricorn
- Mopani

4.2. SURROUNDING LAND USES

The locality of the proposed project is vast and dynamic with various land uses which includes:

4.2.1. Mining

The line stretches from Foskor substation which is located in Phalaborwa within the Foskor mine property, therefore the Foskor mine has been identified as one of the key land users within and around the proposed project area. Phalaborwa Mining Company (PMC), a company that mines vermiculite is also found in the area. Mica is a very small Node within the Maruleng Local Municipality, however it is the centre of Maruleng's fledging mining centre.

4.2.2. Farming

The proposed project transverses various farm of various scales that are used for various purposes including game, crop farming, livestock farming, lodges for tourism purposes etc. The farms located on the eastern part of the map below are predominantly used as game farms of which most have become part of the Kruger national park as per information provided by the landowners.

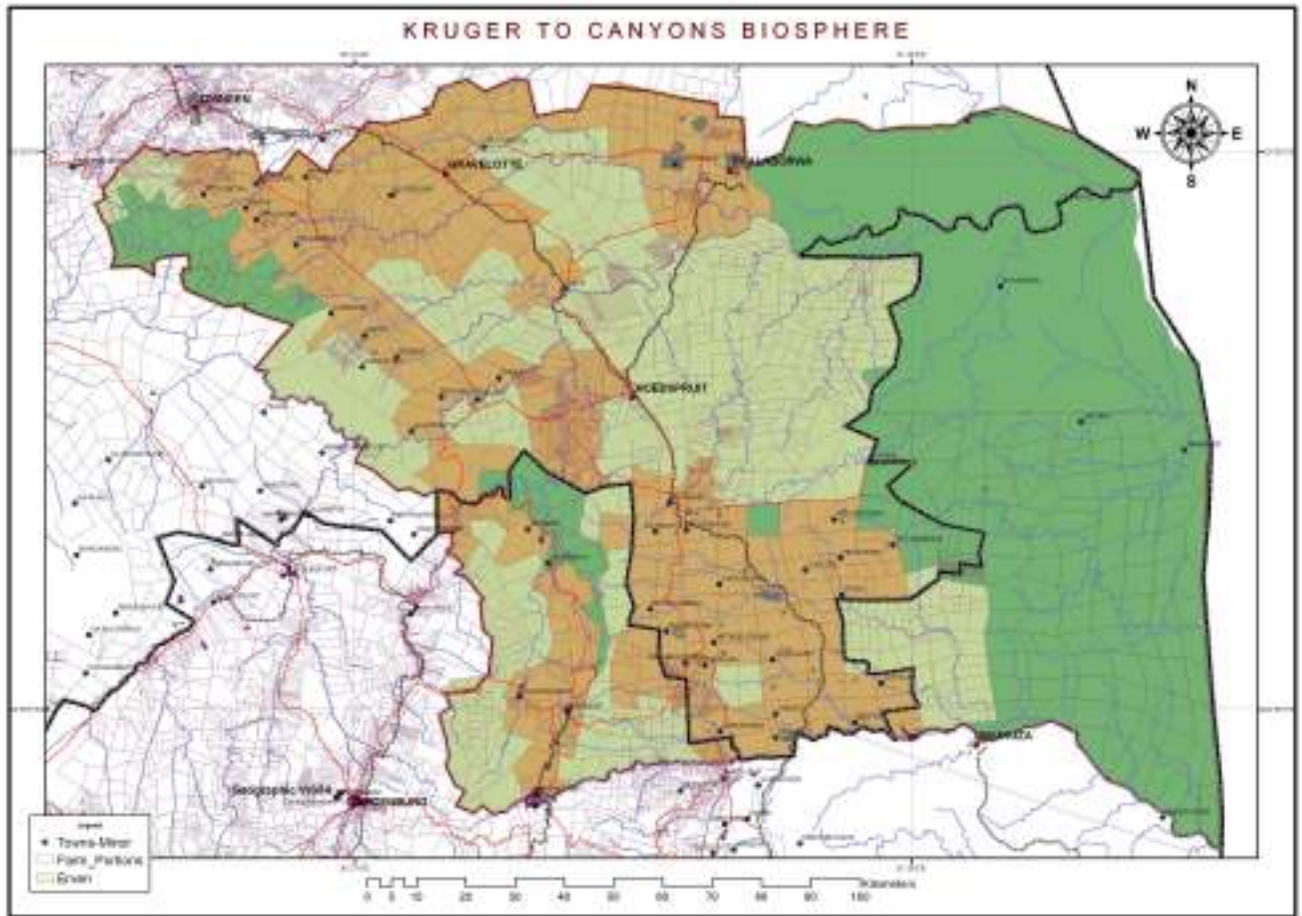


Figure 5: Kruger to Canyon Biosphere – Farms and Ervens in the area

During the Scoping phase of the proposed project, comments and issues were raised by farm owners listed below from which a list of farms in the area was compiled.

Table 2: List of Private Farms

Farm name	Land Use	Ownership
Henk’s Farm	Cattle Farming and Game	Private
Phuza Moya	Game Farming	Private
Balule Nature Reserve	Game Farming	Private (approximately 300 owners)
Olifants West Nature Reserve	Game Farming	Private
Olifants River Game Reserve Share Block Limited	Game Farming	Private (Share block)
Lissataba Game Reserve	Game Farming	Private

Orchard	Crop Farming	Private
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This is however not an exhaustive list of all farms in the area, but of those that formally registered as affected parties.

4.2.3. Residential

The proposed line stretches across small towns and villages that are used for residential purposes. Such small towns include:

Table 3: List of Residential Areas along the Study Area

Town	Villages/Suburbs	General description
Phalaborwa	Phalaborwa	The residential settlement is located on the western side of the proposed line
Maruleng	Finale Diphuti Die Oaks	The two villages are tribal owned and are located north eastern side.
Greater Tubastse	Ga-Marota Ga Moraba Makgwareng	The three villages are under tribal authorities and are located on the south western side.
Burgersfort	Lebohang Monareng Ga-Sepaka	There are various villages that the line transverses in the Burgersfort area and such are under tribal authorities.
Orighstad	Orighstad Town	The line transverses privately owned game farms.
Hoedspruit	Hoedspruit Town	The line transverses privately owned game farms.

Other land uses associated with residential includes schools, hospital facilities, cemeteries and shopping facilities.

4.2.4. Commercial and Industrial

The proposed land uses include industries and other commercial properties including but not limited to:

- Burgersfort Brick Yard
- Ferrochrome Bricks and Paving
- Red Security
- Gage Specialist
- Johnson Crane Hire.

4.2.5. Tourism

The stretch between Phalaborwa and Steelpoort is scenic and thus considered a tourism destination, consequently various lodges and guesthouses were noted in the area. The scenic areas and natural phenomenon attracting tourism in the area includes:

- Game Reserves
- Bourkes Luck Potholes
- Prominent Rock Outcrop
- Blyderiver Caynon
- Beauty of the Valley and Cliffs Unsurpassed
- Waterfalls.

The South Eastern part comprises of conservation area, with various game reserves namely:

- Klaserie Private Nature Reserve
- Selati Game Reserve
- Blyderivierspoort Nature Reserve
- Gwala Gwala Nature Reserve
- Balule Nature Reserve

4.2.6. Sensitive Sites

The South eastern part of the proposed routes comprises of sensitive sites including Heritage sites and important bird habitat as well as sensitive flora. The proposed alternatives furthermore transverses river sensitive zones. Sensitive fauna in the area include the existence of the Cape Vultures particularly in the South Eastern part of the proposed alternatives.

4.3. SURFACE INFRASTRUCTURE

4.3.1. Roads,

The primary roads that exist in close proximity to the proposed site are the R71 to Phalaborwa, R40 to Hoedspruit and R36 to Orighstad which form the access backbone to the study area. The secondary roads include the R530, R531, R532, R536 and R555 linking class 2 towns; these roads provide access to the rural areas conservation and farms through which the line will pass.

The site is accessible through the secondary and primary roads except for the area between Diphuti and Orighstad which is highly mountainous. It is envisaged that the routes that are currently used for maintenance of the existing line will be used for the construction phase of the proposed line and access may further need to be constructed where there are no existing roads.

Other roads in the area provide linkages between different rural settlements and are generally of a poor standard and are poorly maintained.

4.3.2. Power lines

There are several existing power lines in the study area, including an existing 275kV power line that runs from Foskor to Merensky; parallel to the proposed green alternative. Other Eskom lines in the area include: The area already has existing Eskom Lines such as:

- The existing 275kV overhead power lines over a distance of 129km, with a total width of 47m;
- The existing 132kV Eskom overhead power lines; and
- The existing 11/22kV distribution line.

4.3.3. Airports

Several airports and air force base airports and strips are present in the study area. Although some may be non-operational, the airfields must be avoided to ensure utmost safety for the users. Therefore in selecting the appropriate alternative, effort will be made to ensure the power line corridors avoid airfields where possible. The airports noted within the study area are as follows:

- Phalaborwa Airport, located in Phalaborwa. The airport is currently operational and has 1 runway, which is 4491 feet (1369 metres) long. The geographic coordinates of this airport are 23 degrees, 56 minutes, 14 seconds south (-23.937166) and 31 degrees, 9 minutes, 19 seconds east (31.155390). Phalaborwa Airport is 1432 feet (436 m) above sea level.
- Burgersfort Airport, located in Greater Tubatse.

- East Gate Airport is a regional airport located outside Hoedspruit. The airport serves mainly the international tourist market, with connecting flights to and from Oliver Tambo International Airport (Johannesburg)
- Hoedspruit Air force Base Airport in Hoedspruit along the R41 within the Gwala-Gwala Nature Reserve.
- Private air strips within the farms

4.3.4. Photos of the Site

Photos of the site have been attached as Annexure A.

5. DESCRIPTION OF ENVIRONMENT THAT MAY BE AFFECTED

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 (i.e. how, where and when could the project's activities affect various components of the environment). 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.

5.1. GEOLOGY

The geology of the area forms part of the Achaean granite gneiss, which controls most other features of the landscape such as landform, soil, topography and vegetation.

The gneiss, granite and iron formation occur in the northern part of the complex, which is the flatter side of the study area. The highly mountainous southern part of the study area consist of a geological complex dominated by shale, dolomite, sedimentary, quartzite, andesite and arenite as well as other formations as depicted in the geological map below.

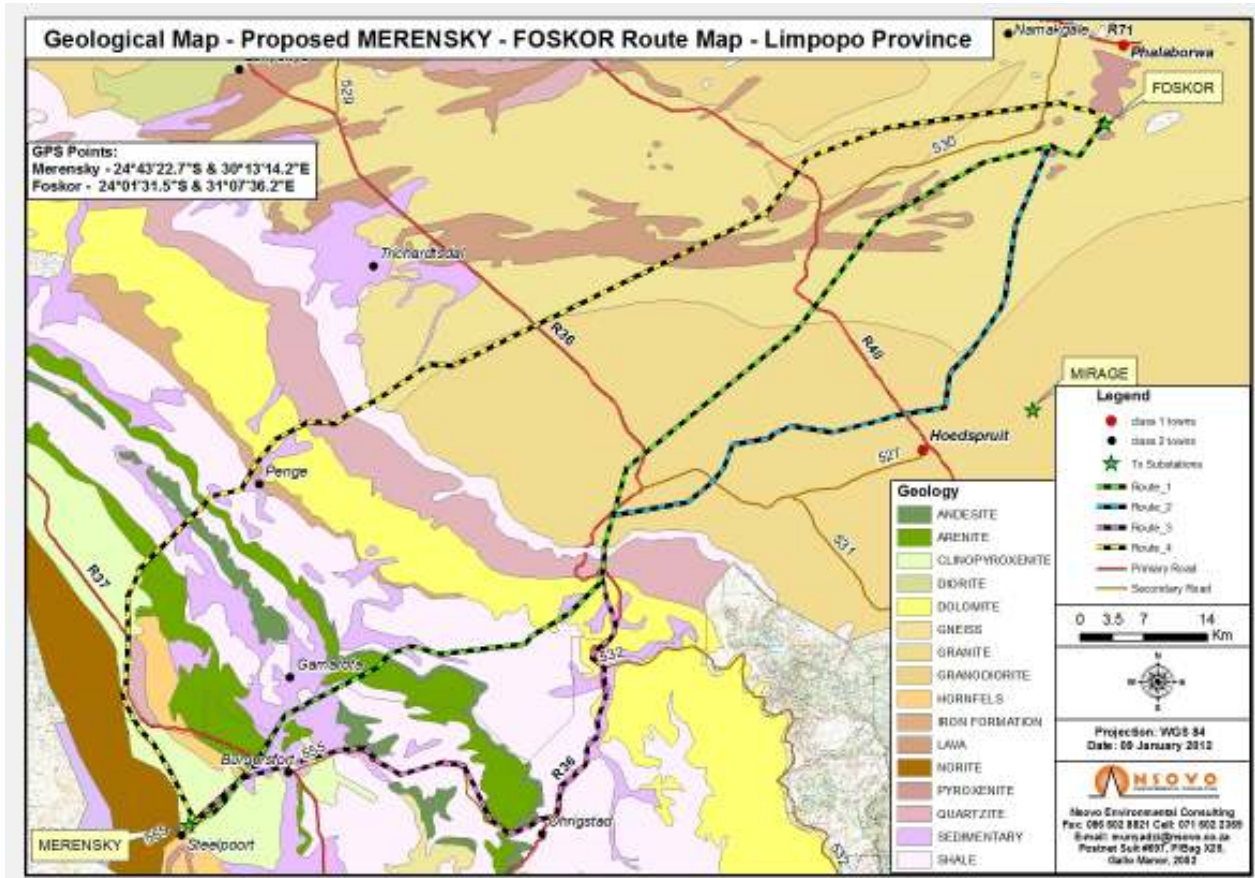


Figure 6: Geological Map of the Study area

5.2. CLIMATE

The site falls within the Limpopo Province’s Lowveld Climatic Zone, experiences typical subtropical, summer rainfall climatic conditions with hot summers and relatively warm winters. The area can experience periods of high humidity, particularly in the first half of the year. The humidity averages between 80% and 85% from January to June and reduces to between 76% and 80% for the remainder of the year. Maximums of 97% have been recorded.

5.2.1. Rainfall

The rainy season, which is seasonal, is from November to March with maximum rainfall in January. The area is characterised by relatively low rainfall and the mean annual rainfall is 513 mm. Rainfall varies from 250 mm – 700 mm per annum in low-lying areas and rapidly increases up to 2000 mm per annum with an increase in altitude in the escarpment region of the Lowveld. The number of rainy days ranges from 63 days per year over low-lying land to over 120 days per year against the escarpment. Most rain falls in the form of thunderstorms and heavy showers in the mornings or early evenings. Hail incidences are infrequent.

5.2.2. Temperature

Daily temperatures generally range from 18 to 30°C in summer and from 8 to 23°C in winter. Temperature extremes range from 43°C in summer and 2°C in winter. It receives the lowest rainfall (0mm) in June and the highest (86mm) in December. The region is the coldest during July when the mercury drops to 6°C on average during the night. Consult the chart below (lower right) for an indication of the monthly variation of average minimum daily temperatures.

5.2.3. Wind

The predominant wind direction in the area is from a south-easterly direction for approximately 70% of the time. Wind speeds are lower in winter than in summer. Over 60% of the wind speeds experienced are between 1.1 m/s and 3.5 m/s, with an average of 29% of the time experiencing calm conditions. Wind gusts up to 10 m/s have been recorded.

5.2.4. Evaporation

Evaporation during the summer months is very high, with a total evaporation annually averaging approximately 1 550 mm.

5.3. TOPOGRAPHY

The study area is situated in the Lowveld region of the Limpopo Province between the Drakensberg escarpment and the Lebombo Mountains, on the eastern border of the province. The Lowveld area lies at approximately 360 metres above sea level.

The area is characterised by a flat to gentle undulating Bushveld landscape, densely covered with indigenous trees and shrubs. In the vicinity of Phalaborwa the monotony is broken by the appearance of unevenly spread conical shaped hills, rising 50 to 90 metres above the Bushveld landscape. These are often referred to as “koppies”. They consist of syenitic rock that represents a separate phase in the geological history of the Phalaborwa Igneous Complex. The contours as indicated on the detailed layout plan (Appendix A) and Figure 6 below, slope from East to west.

Figure 7 depicts the undulating nature of the study area’s topography. The Northern part which is the Phalaborwa area consist of irregular plains while the mountainous southern part of the Lowveld consist of highly changing topography with escarpments, parallel hills and lowlands as well as low mountains.

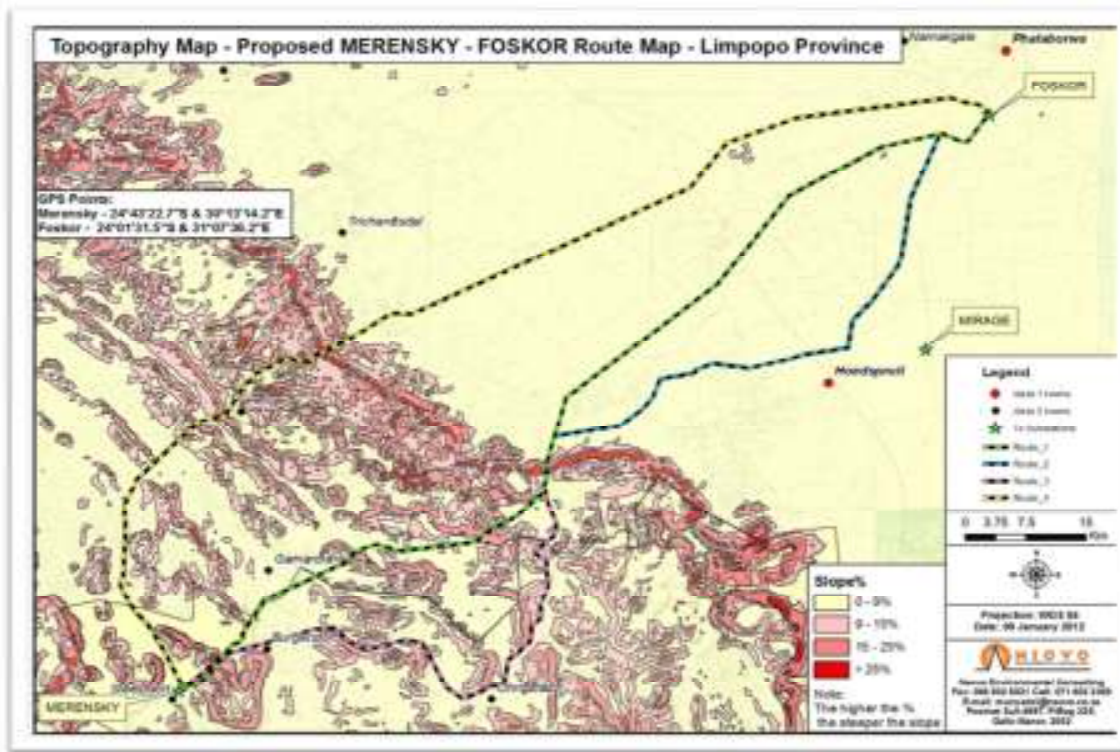


Figure 7: Topographical Map of the Study area.

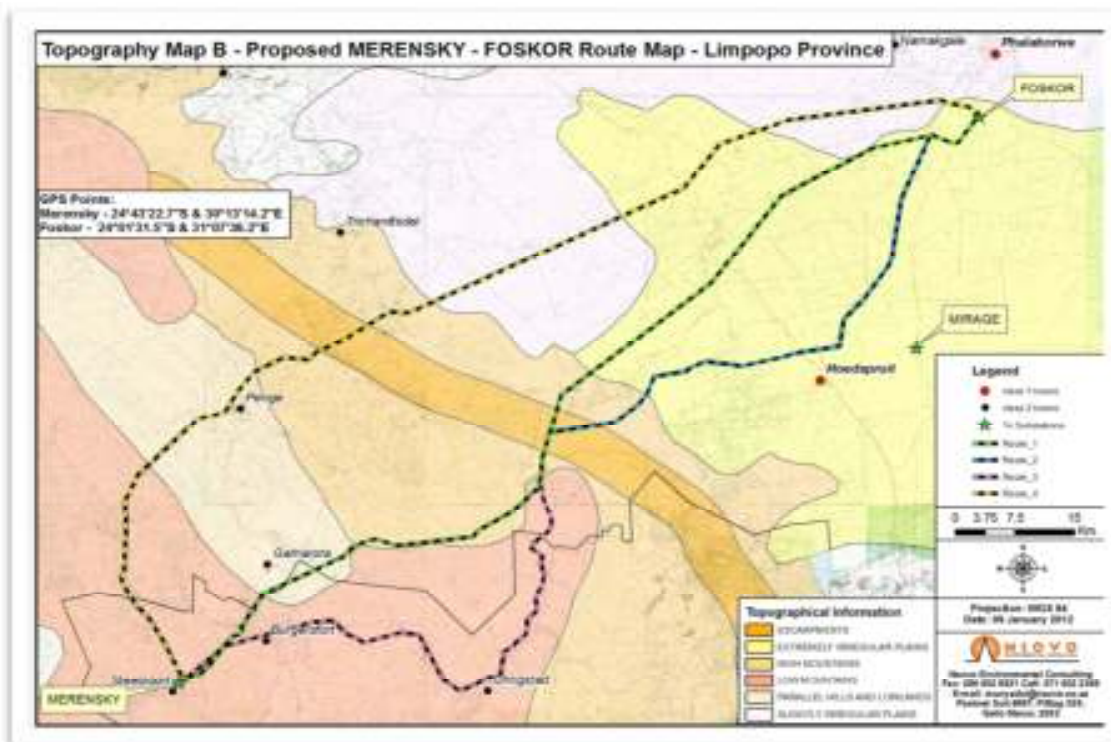


Figure 8: Topographical Map of Study Area

5.4. LAND USE

The land use around the proposed route is primarily mining, related industries and residential as discussed in section 4 above. Other forms of land use include areas classified as natural, such as cattle and sheep farming regions and areas classified as wild, where conservation is the prime land use as well as limited crop farming.

There are currently planned residential developments in Burgersfort; such include the proposed Burgersfort X61 and Khumula Estate. The exact locality of the proposed developments will need to be assessed further to determine the route which least impact on such.

Other proposed land uses within the study area include industrial operations such as the proposed premix plant on Farm Fraaiuitzitch 302 K-T Ptn 9.

5.5. SOILS

The largest part of the Lowveld environment is covered by a shallow granite layer, referred to as mispah, and deeper weathered material of granite gneiss, dolerite and syenite. Polished granite gneiss outcrops are found next to river courses. Thick sand layers occur along the riverbeds in the area. Surface coverage of white calcrete on pyroxenite rock over large areas of the igneous complex shows a marked difference to the reddish-brown soil coverage found in the granite gneiss areas. The calcrete and surface lime coverage on the pyroxenite rock areas varies in thickness from zero to five metres below the surface. Erosion depths vary from zero to fifty metres below the surface.

The Northern part of the study area which is the Phalaborwa and Hoedspruit area is covered by Glenrosa and Mispah soil while the southern part which is highly mountainous consist of rocky areas with miscellaneous soils as depicted in the map below.

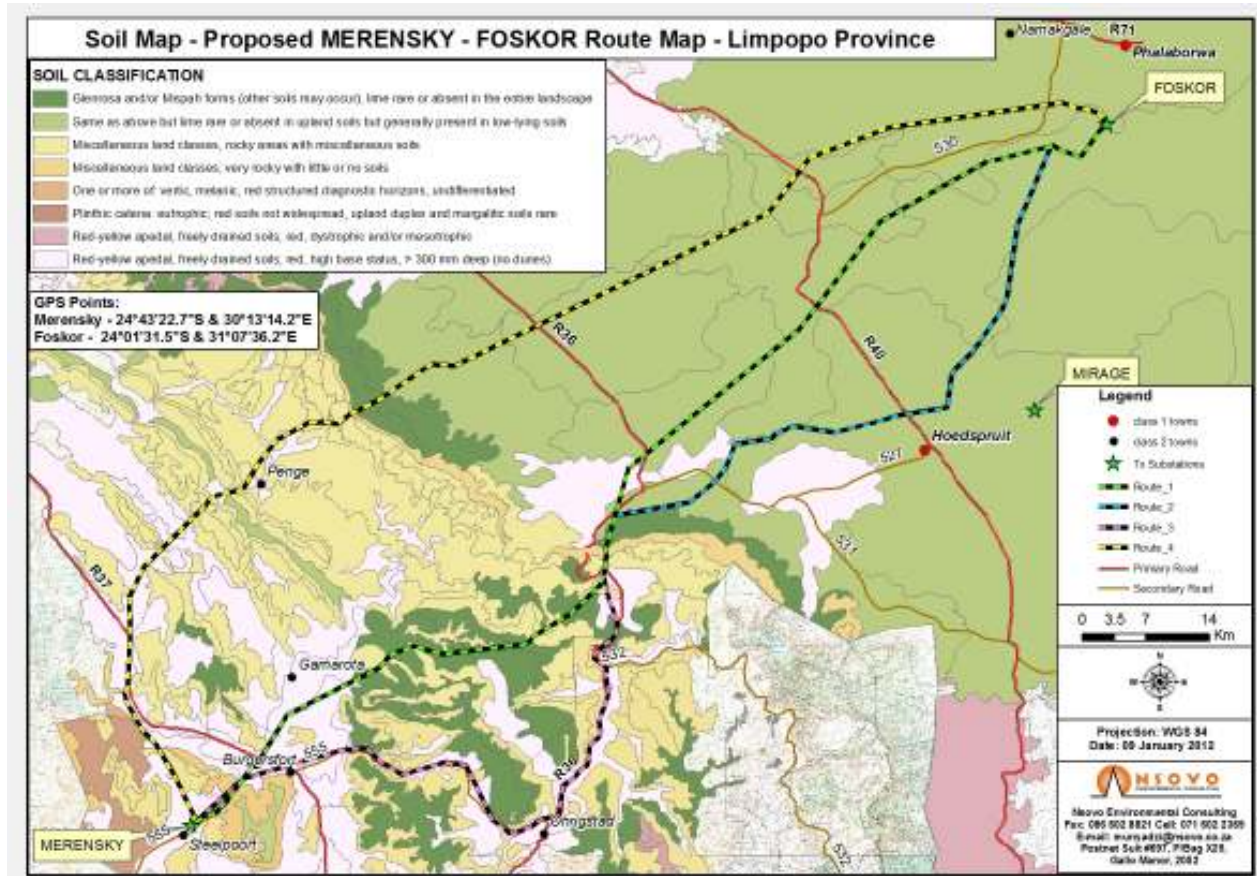


Figure 9: Soil Map of the Study Area

5.6. NATURAL VEGETATION AND PLANT

The area site is situated within a region of the Limpopo province that is classified as falling within the Savannah biome. The vegetation in this biome is tolerant of relatively low rainfall and hot climate. The Savannah biome consists of a grassy ground layer and woody vegetation on the upper layer. If the upper layer is very close to the ground layer it is referred to as shrub-land. Dense vegetation on the upper layer is referred to as woodland, whereas the intermediate stages are referred to as the Bushveld.

The environmental factors under which this biome occurs is an altitude of 2 000 m above sea level and annual precipitation of between 235 to 1 000 mm where frost can occur between 0 to 120 days a year. Savannah vegetation types are commonly used for the grazing of cattle and include: clay thorn Bushveld, mixed Bushveld and sweet Lowveld bushveld.

The vegetation types of the proposed project area are identified as Phalaborwa-timbavati Mopaneveld and Lowveld Rugged Mopaneveld. The vegetation starts from Foskop as flat Mopani veld and continue to become the Lowveld Rugged Mopaneveld in the Rocky area, from the R40 towards Mica it becomes mixed bushveld till Hoedspruit.

The Phalaborwa-timbavati Mopaneveld consists of undulating plains with Sandy uplands and open tree savannah dominated by *Combretum Apiculatum*, *Terminalia Sericea* and *Colophospermum Mopane*. In the clayey bottomlands the *Combretum Apiculatum* is being replaced by *Acacia Nigrescens*. The Lowveld rugged Mopaneveld consists of irregular plains interspersed with steep Slopes and prominent hills. Slopes around the Olifants River are more dissected and steeper. In terms of bio-geomorphology, the rocky outcrops/'koppies' show the largest botanical diversity followed by the intermediate drainage lines.

5.7. ANIMAL LIFE

Due to the fact that the site is located in the Savannah Biome, close to the game farms and the Selati River, there is a high diversity of fauna species found in the area.

Mammal species commonly in the area include:

- African Elephant (*Loxodonta Africana*);
- Buffalo (*Syncerus caffer*);
- Hippopotamus (*Hippopotamus amphibious*);
- Lion (*Panthera leo*);
- Giraffe (*Giraffa camelopardalis*);
- Impala (*Aepyceros melampus melampus*);
- Kudu (*Tragelaphus strepsiceros*);
- Waterbuck (*Kobus ellipsiprymnus*);
- Bushbuck (*Tragelaphus scriptus*);
- Grey/Common Duiker (*Sylvicapra Grimmia*);
- Steenbok (*Raphicerus campestris*);
- Chacma Baboon (*Papio cynocephalus ursinus*);
- Vervet Monkey (*Cercopithecus pygerythrus*);
- Warthog (*Phacochoerus africanis*); and
- Bushpig (*Potamochoerus porcus*).

Various reptile species, including the crocodile (*Crocodylus niloticus*) occur within the proposed project area. The rocky outcrops/'koppies' found in the area have a high fauna species diversity as they provide important habitat for spiders, lizards, snakes, birds and small mammal species. Furthermore the high plateaus are inhabited by mountain reedbuck, baboon troops and rock hyraxes. Hippo and crocodile are present in the rivers and dams in the area, while Impala, kudu, blue wildebeest, waterbuck and zebra roam the wooded lowveld area.

Exotic fish like smallmouth bass, brown and rainbow trout occur in the river, which have reduced the range of the local Treur river barb to upper catchments of the Blyde River system.

5.7.1. Avifauna

The area is rich in bird (avifauna) biodiversity with species common to the Savanna biome. The South Eastern parts consist of sensitive fauna including Cape vultures. African fish eagle and African fin foot are found along the Blyde River. The lowveld woodlands harbour purple-crested lourie, emerald cuckoo, red-backed mannikin, golden-tailed woodpecker, gorgeous bushshrike, white-faced owl and a number of raptors like white-backed vulture, gymnogene, black-chested snake eagle, Wahlberg's eagle and long-crested Eagle. A number of raptors frequent the mountains and cliffs, including cape vulture, black eagle, jackal buzzard, peregrine falcon, lanner falcon and rock kestrel.

Birds associated with flowering plants of the higher slopes include Gurney's sugarbird and malachite sunbird. A breeding colony of bald ibis occurs in the grassy uplands, besides small numbers of cape eagle-owl and red-breasted sparrow hawk. Forest birds include crowned eagle, cinnamon dove, olive bushshrike, green twin spot and wood owl.

A detailed avifauna study will be done during the EIA phase.

5.8. SURFACE WATER

The Olifants and its tributaries form the primary surface water drainage of the proposed study area and is only Class 1. Class two rivers include Blyde River, Orighstad River. Ga-Selati River, Speckboom and Makutswi Rivers.

Rainfall ranges between 500 and 1000 millilitres per annum, with the Northern part, which is Phalaborwa receiving the least rainfall, while the Hoedspruit area is relatively wetter, the Burgersfort and Steelpoort area is depicted as the wettest area within the proposed study area.

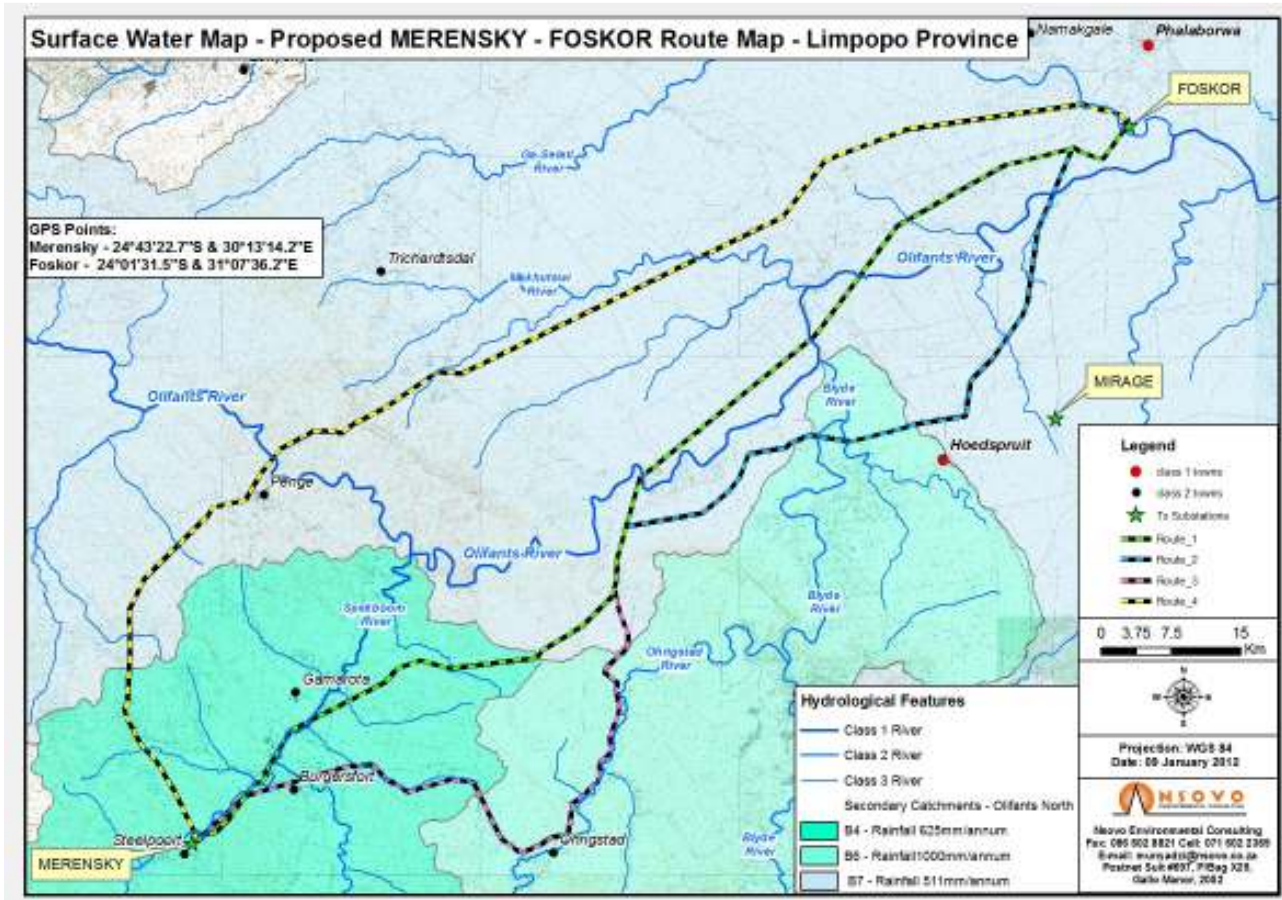


Figure 10: Surface water in the area

5.9. SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

The study area is located in Limpopo province and area known to be rich in culture and heritage. Various monuments, heritage parks, rock art, shelters, caves burial grounds and other historical buildings are located in the study area representing various historical moments in South Africa’s history.

The Foskor site is located in an area that has a rich cultural heritage marked by a number of heritage sites that date from the Iron Age (i.e. from the turn of the 19th century and the early 20th century). These heritage sites are associated with pre-historical and historical mining and metal works remains and are mainly located on the rocky outcrops (‘koppies’) in the area. Stone Age and Iron Age sites are also found in the area.

Phalaborwa further houses the Masorini Museum which is located inside Phalaborwa Gate (Kruger National Park) which is one of the top ten sites. A Late Iron Age archaeological site showing smelting furnaces, homesteads and historic implements.

A detailed specialist studies will be undertaken for this particular project to assess the potential impact on heritage with full consultation with the Limpopo Provincial Heritage Resource Agency.

5.10. SENSORY ASPECTS

5.10.1. Noise

The ambient noise levels of the proposed study area are within acceptable limits.

5.10.2. Visual Aspects

Visual appreciation or dislike is subjective and thus what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape the impact of new developments and structures tends 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 study area is managed for purposes of conservation, agriculture, forestry or is communal land devoid of any imposing infrastructure such as transmission lines. The natural landscapes of much of the study area are sensitive and important to preserve for their aesthetics. It is, thus, necessary to maintain a near natural visual landscape, with limited aesthetic affects, to enable the continuation of nature-based economic activities such as ecotourism.

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, conservationists and operators involved in eco-tourism activities. Many topographical features influence this environment and these features will need to be utilised when selecting an alignment so as to minimise visual impacts and intrusions.

5.11. REGIONAL AND SOCIO ECONOMIC STRUCTURE

The proposed project transverse across three district municipalities namely:

Mopani District Municipality is located in the Lowveld and houses five municipalities of which two are within the proposed corridor. The two municipalities are:

- **Ba-Phalaborwa Municipality** is situated on the North-eastern part of South Africa in the Limpopo Province. It is one of the four local municipalities in the Mopani District. The Municipality serves as a convenient gateway to the Kruger National Park and the Trans frontier Park through the Mozambique Channel. The municipality has a population of 127308 with 33792 households.
- **Maruleng Municipality** was first established in 1997 under the name Hoedspruit/ Makutswi TLC. The Municipality is the home of Hoedspruit, known as the tourism Mecca of Limpopo. Hoedspruit lies in the heart of the central Lowveld and is conveniently situated to explore the many game lodges; game reserves and other attractions in the vicinity owing to the vast plains of marula, acacia, combretum and mopane woodlands accommodate a wealth of wildlife and stretch as far as the eye can see. The Municipality is also known for its agricultural strengths. The Blyde Valley sugar and Letsitele citrus plantations. The municipality has a population of 95779 with 24589 households.

Sekhukhune District Municipality is a cross-border municipality between Limpopo and Mpumalanga Province. It is a rural area with an economic base in the fields of mining and agriculture. With good soil, a sub-tropical climate and the availability of reasonable quantities of water, the area boasts of a strong and prosperous farming industry which consists of citrus, grapes, tomatoes, sweet potatoes, cabbage, peppers, beans and pumpkins, wheat, maize, cotton and tobacco. The region is endowed with mineral resources like chrome, platinum and diamond deposits. The proposed study area transverse two of the five municipalities namely:

- **Fetakgomo Local Municipality** is a local municipality in the Sekhukhune District, which is blessed with mineral deposits, such as platinum, chromium and diamond. It is situated in the fertile soil alongside the rivers of Lepelle and Lepellane, offering great agricultural potential. The municipality has a population of 112232 with 21857 households.
- **Greater Tubatse Local Municipality** is a local municipality comprising of the Burgersfort town which is rapidly growing. The municipality has a population of 343468 with 66611 households.

Capricorn District Municipality also has five municipalities of which one forms part of the study area. The municipality that lies along the proposed corridor is:

- **Lepelle-Nkumpi Local Municipality** is one of the local municipalities within the Capricorn District Municipality in Limpopo Province. The municipality is located 55km south of the district and Polokwane city. The municipality is pre-dominantly rural with a population of 241414 and covers 3,454.78km, which is 20.4% of the district's total land area.

The Table below demonstrates the socioeconomic and demographics of the three main district municipalities.

Table 4: Socioeconomics and Demographics

Description	Capricorn	Mopani	Sekhukhune
Area km ²	16.970	11.098	13.264
Population:			
- Total population	1,154,690	964,230	1,024,748
- Male	45,6%	45.0%	40.0%
- Female	54,4%	55.0%	60.0%
Density (population/km ²)	68.0	86.9	56.2
Growth rate	1.66	2.03	0.76
- Youth	52.6%	51.3%	50.0%
- Disabled	3.5%		
Households:			
- Total Number of Households	270,234	247,997	217,000
- Female headed households			
- Child headed households			
- Average household size	4.36	3.9	
Unemployment level:			
- Economically Active population			
- Number of unemployed	140,738	112,682	109,368
- Percent unemployed	50.7%	41.8%	69.4%
Poverty Level:			
- Number under absolute poverty	680,216	537,757	545,361
- Percentage of poor	65.3%	55.5%	67.2%
- Contribution to provincial poverty	20.2%	15.9%	16.2%
Skill Level (% of total population)			
- Unskilled	18.4	25.6	26.8
- Semi-skilled	53.6	52.4	52.7
- Skilled	23.3	18.4	18.1
- Highly skilled	4.7	3.6	2.4
HIV prevalence:			
- Total Number			
- Percentage of total population	20%	23%	14%

Access to Clean Water: (%)			
- Piped water private and in yard	57.2%		8.3%
- Piped water communal	18.6%	84.1%	33.5%
- Boreholes			
- Other sources	24.2%	15.9%	58.2%
District overall Contribution to the Provincial Economy (%)	24.17	20.00	7.25

5.11.1. HIV/Aids

The HIV/AIDS pandemic in South Africa is likely to have profound negative, long-term impacts on the socio-economic environment. In 2006, statistics showed that approximately 18.34% of the country's population between the ages of 15 and 49 years, and 10.8% of the South African population over the age of 2, is living with HIV (www.avert.org/safricastats.htm).

The pandemic is also likely to cause a slowing of the population growth rate in municipal areas and alter the demographic profile of municipalities. Women are particularly susceptible to the HIV/AIDS epidemic and the burden of AIDS related illnesses and deaths would be felt not only by infected individuals but also their families. Households will suffer a loss of income when economically active family members are unable to work.

It is anticipated that the HIV/AIDS pandemic will affect medium and long-term development planning at a district and local municipal level in all municipalities. The HIV/AIDS pandemic will, therefore, affect infrastructure planning by reducing the projected number of people for which infrastructure will be required. Consideration must be given to the impacts of HIV/AIDS on the ability of households to pay for services and the potential increase in demand for health care facilities and social services.

Within the communal areas for this proposed project, it would appear that some homesteads are abandoned or are being headed by the youth or elderly as a result of HIV/AIDS causing deaths or terminal illness of the middle age groups and young adults. These elderly or young people are vulnerable and, in light of this, could make any resettlement processes complicated. Further investigation into this pandemic is required in the EIA phase of this study.

5.11.2. **Economic Profile**

The Limpopo Province enjoys a competitive advantage in mining, agriculture, tourism and manufacturing. The economy of the Limpopo province has been growing at an annual average of 4% since 1996. The Limpopo Province has experienced a faster than average economic growth in recent years primarily due to growth in the agricultural, power, tourism and mining sectors, according to the Limpopo Economic Development Report on www.limpopoled.com. The economic potential exists for these sectors to significantly impact the future growth of the Province.

In terms of agriculture, due to the vegetation and adequate rainfall the Mopani district which forms part of the study area has a potential for cash crops, animal breeding and forestry.

The mineral deposits in the Sekhukhune and Mopani districts are already being mined and can be further developed.

In addition the Province is endowed with natural heritage and game parks which increases the potential to tap into the tourism industry across all five districts.

The increase in electricity availability in the eastern region of Limpopo will undoubtedly be advantageous to the overall economy of the region.

5.11.3. **Tourism**

The study area is located in Limpopo, a province which is home to numerous nature reserves and parks. Besides the well-known national parks, such as the Greater Limpopo Park (Kruger National Park), Mapungubwe and Marakele approximately 50 further provincial nature reserves exist in this exquisite province that reflects the diversity of this pristine part of the world.

The nature reserves in Limpopo have the dual task of ecological conservation of unique destinations as well as the development of eco-tourism projects in co-operation with the respective local communities. The study area is not only rich in wildlife, but offers spectacular scenery of mountains, rivers and dams, a rich history and many cultural attractions.

5.11.4. **Institutional Environment**

A range of formal institutions are found within the study areas including conservation organisations, tourism organisations, residents' associations, farmers' associations, industrial and business organisations, and traditional authorities. A select few of these are listed below.

5.11.5. Sensitivities

Social issues that may result from the project are as follows:

- Changes to quality of life and sense of place,
- Noise pollution,
- Influx of job seekers,
- Influx of construction workers,
- Crime and security,
- Impact on farm sizes and loss of farm land; and
- Negative financial influence of properties.

These issues will be assessed by the Social specialist in the Impact Assessment phase of the project.

6. IDENTIFICATION OF ALL LEGISLATION AND GUIDELINES THAT HAVE BEEN CONSIDERED IN THE PREPARATION OF THE REPORT

Documented in the subsequent section is a list of the current South African environmental legislation, which is considered to be pertinent to the construction and operation of the proposed substation and associated power lines. A description of legislation pertaining to the project is summarized in Table 3 below.

The Environmental Impact Assessment (EIA) process followed is in compliance with the NEMA and the Environmental Impact Assessment Regulations of 2010 (Government Notices No R543, R544 R546 and R546 of 18 June 2010). The proposed development involves 'listed activities', as defined by the NEMA. Listed activities are activities which may potentially have detrimental impacts on the environment and therefore require environmental authorization from the relevant authorizing body. The proposed development occurs within Gauteng and thus the provincial authority is GDARD, while the DEA is the decision making authority.

This list is not intended as an exhaustive analysis of the applicable environmental legislation but provides a guideline to the relevant aspects of each Act.

Table 5 Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act, 1998 (Act No. 107 of 1998)	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act (NEMA The principles set out in the National Environmental Management Act (Act No. 107 of 1998), hereafter referred to as NEMA, applies to all listed projects. Construction and operation have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the Biodiversity Act 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. The diversity of ecological processes for the application sites is to be determined through the specialist studies to be conducted. The outcome/recommendations of the specialist studies will determine the manner in which the biodiversity on site is to be managed, and whether the ecological elements on site need to form part of a greater environmental management framework for the region.
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. The diversity of ecological processes for the application sites is to be determined through the specialist studies to be conducted. The outcome/recommendations of the specialist studies will determine the manner in which the biodiversity on site is to be managed, and whether

Aspect	Relevant Legislation	Brief Description
		the ecological elements on site need to form part of a greater environmental management framework for the region.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	<p>The National Heritage Resources Act 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).</p> <p>The size of the application sites warrants that a specialist Heritage Assessment be conducted. Mr. Jaco Vander Walt, a specialist from Wits Enterprises has been appointed to conduct the Heritage Impact Assessment for the project. This report will form part of the EIA report, and the findings of the specialist input will be reported upon in detail.</p>
Air quality management and control	<p>Atmospheric Pollution Prevention Act (Act 45 of 1965)</p> <p>National Environmental Management: Air Quality Act 39 of 2004</p>	<p>The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air and to prevent pollution of air and ecological degradation.</p> <p>Part 6 of the Act makes provision for measures to control dust, noise and offensive odours. Section 33 specifically provides for the submission of plans to prevent pollution once mining operations have ceased.</p> <p>The assessment of impacts relating to air quality control and management, where appropriate, will form part of the environmental impact assessment report and environmental management plan. It follows that this provision must be read together with the statutory requirements of the as well as the National Environmental Management: Air Quality Act. The Proposed Area has not been declared as a dust control</p>

Aspect	Relevant Legislation	Brief Description
		<p>area in terms of section 27 of the APPA.</p> <p>Section 32 of The National Environmental Management: Air Quality 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 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 by dust or other measures aimed at the control of dust.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation Act 73 of 1989	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the environmental impact assessment report and environmental management plan. Applicable laws regarding noise management and control refers to the national noise control regulations issued in terms of the Environment Conservation Act 73 of 1989.
Water	National Water Act 36 of 1998	This Act provides for fundamental reform of law relating to water resources and use. The preamble to the Act recognizes 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.
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. ²⁸ Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act
Human	The Constitution of	The Constitution of South Africa, 1996 (Act No. 108 of

Aspect	Relevant Legislation	Brief Description
	South Africa, 1996 (Act No. 108 of 1996	<p>1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). In terms of Section 7, the state is obliged to respect, promote and fulfil the rights in the Bill of Rights. The environmental right states that:</p> <p>“Everyone has the right -</p> <p>a) To an environment that is not harmful to their health or well-being; and</p> <p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <p>Prevent pollution and ecological degradation; Promote conservation; and Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</p>

This Acts will be read together with the following key Document and Policies:

- Municipal Integrated Development Plans for all affected municipalities
- Environmental Management Framework
- Municipality Policies and By-Laws
- State of the Environmental Reports

7. INFORMATION ON THE METHODOLOGY THAT WILL BE ADOPTED IN ASSESSING POTENTIAL IMPACTS INCLUDING ANY SPECIALIST STUDIES THAT WILL BE UNDERTAKEN

The assessment of impacts will largely be based on DEAT’s (1998) Guideline Document: EIA Regulations. The assessment will consider impacts arising from the construction and operation phases of the proposed project both before and after the implementation of appropriate mitigation measures.

It is proposed that the impacts will be 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, mitigatory 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 is to be assessed and described in relation to the extent, duration, intensity, significance and probability of occurrence attached to it.

Status of Impact

The impacts are to be 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).

8. 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 as a result of the proposed development. 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.

Table 6: Environmental Issues and potential impacts identified:

Issue	Rating	Description
Employment	Positive-No mitigation required	Job creation and investments into the project 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	The only 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 if not mitigated the impact may be local in extent, and short term. Mitigation measures such as regular dust suppression can reduce the impact to become site specific.

Visual Impact	Negative	<p>The visual impact of the power lines would be at its maximum at distances of 500 m or less. However, 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 500 m, and at 2 km, is one eighth of the impact viewed from 500 m. Therefore, objects appear insignificant in any landscape beyond 5 km.</p> <p>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.</p> <p>The proposed activity will indeed change the visual character of the site particularly considering that the proposed site is located in an area that is undulating; the slightly elevated points of the line may be viewed from a distance, while the stretch that directly crosses communities will be viewed at a close range while 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 site and the exact location of the station the impact can be considered definite, long term, local in extent and possibly low in significance.</p> <p>A visual impact specialist has been appointed to assess the extent of the impact and the report will form part of the EIR</p>
Flora and Fauna	Negative	<p>Various plant and animal life were noted on site. As with most large scale infrastructure construction, vegetation clearance is a requirement. This action is a disturbance of the natural ecosystem and must be taken into consideration. The ground cover comprises mainly of shrubs and grasses and mature trees along the site boundary.</p> <p>The impacts to vegetation will negatively impact on habitat, and consequently the faunal elements of the receiving environment.</p> <p>An Ecological specialist has been appointed to assess the impact of the proposed project on</p>



		<p>ecology and the report will form part of the EIR.</p>
<p>Noise</p>	<p>Negative</p>	<p>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 noise over different distances from the source (SABS 0357 – ‘The calculation of sound propagation by the Concawe method’), and standards for different sectors (e.g. industry). SABS 0103 (SABS 1994) and SABS 0357 (SABS 2000) are used extensively in this report.</p> <p>An increase in noise is expected due to construction, which might have an impact especially on the surrounding residential settlements as well as the adjacent school in Finale and Diphuti. 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 103 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.</p> <p>Given the proximity of the line to some of the schools, noise during the construction phase may be a disturbance, however, given the short span of the construction phase it can be managed.</p>

Land Use	Negative	<p>The proposed study area has varying land uses ranging from mining to small scale farming. The primary uses identified are game and livestock farming as well as limited crop farming. The proposed project may have a considerable impact particularly during construction while the extent and severity of the operational impact will be greatly reduced as the land uses will continue.</p>
Bird Population	Negative	<p>The interactions between birds and electrical infrastructure i.e. power lines can be divided into direct and indirect interactions. Direct interactions occur when birds collide with power lines, possibly because they fail to see the wires as they are focusing on something that lies beyond, e.g. a perch or food source. Birds might also be killed by striking power lines support structures .The likelihood of birds colliding with power lines depends on:</p> <ul style="list-style-type: none"> • The sitting of the power lines in the landscape - Differences in vegetation, topography, elevation and species composition can influence risk, as can proximity to food sources and roosting areas; power lines placed in valleys, on ridges, near water or on steep hillsides are dangerous to birds. • Land use - Agriculture (e.g. crop types, harvest times and methods) can have a large influence on bird abundance and behaviour; a high abundance of birds may be associated with seeding, cultivation and harvesting. • The type of birds being considered are Medium to large birds that are generally at higher risk; day flying raptors, especially buzzards, eagles, griffons and kestrels, certain pigeons, owls, and (possibly) coots are higher risk. Particular species may be more at risk, as their flight characteristics differ. • The type of flight - Birds undertaking local flights tend to fly lower than birds on migratory flights, and migrants are generally only at risk near roosts. • Weather conditions - Rain, fog and wind may increase the risk of birds flying into turbines; birds tend to fly lower during strong headwinds, but slow winds can prompt large soaring birds to fly lower.



		<ul style="list-style-type: none"> Indirect interactions occur when wind turbines cause changes in the environment, which in turn cause some birds to interact more strongly with the turbines. For example, disturbance of the soil during construction may cause an increase in the number of rodents in the area, which then attract birds of prey to the area. Similarly, seed eating birds may be attracted to construction sites in the short term. Disturbance and habitat loss could also cause some bird species to abandon the area. <p>For the proposed project, major risks to wild and domestic birds may be caused by the proposed facilities are disturbance by construction activities (temporary), on-going disturbance during operation phase (semi-permanent), collision wires, collision with supporting power line and electrocution on associated power line.</p> <p>This impact is local, long term, high probability and significant. If proper measures are in place the impact can be reduced to medium or low in significance.</p>
Waste	Negative	<p>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.</p> <p>Waste material may be generated during the construction phase of the project. Such waste may accumulate from the workers campsite or from litter left around the work area by the construction team. Other waste substances may accumulate from cement bags amongst other construction material.</p> <p>The impact of waste is definite will last for the duration of the construction phase and if not mitigated it can be long term.</p>

Soil Erosion	Negative	Movement of heavy machinery across the land as well as vegetation clearance may cause destabilisation of soils which then become susceptible to erosion. Continuous movement of vehicles over the land during the construction phase may leave it susceptible to erosion.
Heritage	Negative	The heritage significance of each site has been assessed in terms of the National Heritage Resources Act. During the scoping cemeteries and private burials within households were noted particularly in Finale. The existence of these graves along the corridor may require specialist attention, hence a specialist HIA has been appointed to identify and assess the extent of the impact of the proposed project on heritage resources.
Servitudes	Neutral	Existence of servitudes needs to be taken into consideration in the design and layout of the proposed project. Regulations pertaining to servitudes needs to be taken into consideration. There are existing lines in the area which will be taken into consideration. Potential impacts on this servitude will be investigated during the EIA phase.
Surface and Ground Water Pollution	Negative	<p>The proposed alternatives cross rivers, streams and dams. The impact on water quality if any could be decrease in quality and contamination of surface and ground water. This could result from fuel spillages, sewer systems etc. The impact on water is site specific but can be local or regional if proper measures are not put in place.</p> <p>The may be a need to apply for water use licences with DWA considering the number of crossings and proximity of the line to surface water bodies.</p>
Climate	Neutral	Local climate conditions do not appear to be of a significant concern to the proposed project. The stretch between the Greater Tubatse areas is highly mountainous, hence prone to lightning. Measures will have to be put in place during the design of the structures to ensure diversion. In a broader scale the project will have no impact on the local and/or global climate change.



<p>Topography</p>		<p>The topography of the study area is flat to undulating, this may pose design challenges particularly in the highly mountainous area.</p>
<p>Social Environment</p>		<p>The construction phase may have an impact on the surrounding residents if not properly managed. It could result to disturbance of residents as a result of construction related activities. Other impacts may be safety, considering the proximity of the primary schools to the proposed line. The potential increase in traffic may pose a safety risk to surrounding residents, particularly scholars. Other social related issues may include theft. This impact will be local.</p> <p>Traffic</p> <ul style="list-style-type: none"> · During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. · Unmanaged construction vehicles may decrease road safety to other road users. · Uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. <p>Noise</p> <ul style="list-style-type: none"> · The ambient noise levels in the area are relatively low; therefore, uncontrolled construction activities may negatively impact on such. <p>Employment and Community Related Impacts</p> <ul style="list-style-type: none"> · The likelihood of employment opportunities may result in an influx of workers to the area, thereby impacting existing community networks and perceptions of safety and crime levels. · Unmanaged workforce may result in illegal township establishment and increased numbers of informal settlements which may negatively impact a range of environmental elements.

9. DETAILS OF THE PUBLIC PARTICIPATION

The principle of public participation holds that those who are affected by a decision have a 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 Scoping 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 as follows:

- The public participation process communicated the interests and met the process needs of all participants.
- The public participation process sought out and facilitated the involvement of those potentially affected.
- The public participation process involved participants in defining how they participate.
- The public participation process provided participants with the information they needed to participate in a meaningful way.
- To ensure that the public participation is as inclusive and transparent as possible, it was conducted in line with the requirements of Regulation 54 of NEMA (Act 107 of 1998) as amended.

As part of the public engagement strategy a background research was carried out to determine the key stakeholders in the study area and to try and arrange introduction meetings scheduled during the site visit.

The primary objectives of this site visit were:

- Determining venues for PIP such as public review of documents and holding of public meetings (if required);
- Identification of key stakeholders;
- Introduction to local authorities and ward councillors; and
- Identification of contact persons at key venues (draft reports as well as meetings).

The PIP included the following:

9.1. PLACEMENT OF AN A2 SIZE LAMINATED NOTICE AT THE PROPOSED DEVELOPMENT SITE.

Two on site notices were placed at conspicuous places in the vicinity of the proposed project site on the 24th and 25th October 2011. The site notices were placed at schools, shops, road crossings etc. The site notices were placed for a period of 40 days. Response was received from the interested and affected



parties following the placement of the notices. Please see Appendix C3 for the site notice and proof of the site notices as they appeared on site.

9.2. DISTRIBUTION OF A4 NOTICES TO SURROUNDING LAND OWNERS/ OCCUPIERS (LIMITED TO HAND DISTRIBUTION WITHIN 100M OF THE BOUNDARY OF THE SITE);

A4 notices similar to the newspaper advertisement and site notices were prepared in four common languages in the area namely English, Sepedi, Afrikaans and Xitsonga. The purpose of the notices was to extend an invitation to the stakeholders to participate in the process. The notices were distributed to households, schools, commercial properties adjacent the proposed line. This exercise allowed for one on one communication with the residents. Detailed correspondence during the distribution of notices is attached as AnnexureC5.

9.3. PLACEMENT OF ADVERTISEMENT IN THE LEGAL SECTION OF ONE LOCAL NEWSPAPER, ON THE PROVINCIAL GAZETTE AND OTHER NATIONAL PUBLICATIONS AS PREFERRED BY THE CLIENT

Notices were placed on the legal section of the following newspapers on the 20th and 21st October 2011:

- Sowetan (20/10/2011)
- Beeld (20/10/2011)
- Lethaba Herald (21/10/2011)
- Mopani Herald (21/10/2011)

A period of 40 days was allowed for the public to officially register as interested and affected parties and comment, raise their concerns and issues on the proposed project. Response was received from the I&APs telephonically, via email and telefax following the placement of the advertisement. Such correspondence has been included in the Public Participation Report attached as Annexure C7

9.4. BACKGROUND INFORMATION DOCUMENT

A background information Document was compiled and made available on request to those who register as I&AP's. The primary objective of the BID was to raise awareness of the project, enable the stakeholders to understand the project and familiarise themselves with the area in consideration. The BID was forwarded via email and post to I&APs. The BID has been attached as Annexure C1.

As a result of the public notification a register was opened and maintained which recorded all contact details of persons whom have submitted written comments or responded to the notification and who have requested that they be registered as Interested and Affected Parties (I&APs). All registered I&APs will be informed of the required process of involvement as defined by the EIA regulations.

An Issues and Response Report (IRR) was compiled for the study. This report commenced during the Scoping Phase and will continue during the EIA Phase.

The IRR will capture the following information:

- Date of comment/question.
- Method of comment/question (e.g. Public Meeting, letter, etc.).
- Name and organisation of the person who made the comment/asked the question.
- The comment/question. The issues and response report will be grouped according to the themes of the issues and concerns raised.
- An answer to the question/response to the comment or a reference as to where such information may be obtained in the Report.

As part of the Public Participation Process the registered I&APs will be given an opportunity to comment on the scoping reports which will be placed at an accessible public place for a period of 40-days.

9.5. REVIEW OF DRAFT REPORT AND PUBLIC MEETINGS

The Draft Scoping Report was made available for review and comment as from the 17th January 2012 to the 27th February. An advertisement was placed on the National paper and Sowetan informing them of the availability and places where the report could be accessed. Electronic reports and discs were also made available on request.

Comments received from I&APs on the Draft Scoping Reports have been incorporated into the report as far as reasonably possible.

Focus group meeting and public meetings were held with the different stakeholders in February at accessible venues within the community. Notices were placed at the venues and on the local paper to inform the communities of the meeting. Furthermore letters were sent to stakeholders via post, email and fax inviting them to meetings (Proof of such is attached in the PPP report).

Key issues raised during the public meetings and review of the draft report includes:

- Visual Impact of power lines
- Property prices



- Security threat to endangered White and Black Rhino
- Safety risk for contractors during the construction phase
- Issue of contractors camp
- Existing air strip
- Sensitive Flora in the area
- Ineffectiveness of the public participation process

Minutes of the Public and Focus Group Meeting are attached as Annexure C 9.5 and the Issues and Response has been attached as part of the PPP report. These issues will be discussed further during the EIA phase wherein input will be solicited from specialist.

10. PLAN OF STUDY FOR EIA

Please refer to Appendix C for Plan of Study.

11. CONCLUSION

The Environmental Scoping Study was performed as dictated by the National Environmental Management Act and associated regulations as well as the EIA regulation as published by the National Department of Environmental Affairs.

The site has been under detailed assessment and the primary objective is to assess the suitability of the site for the intended use as well as to assess the impact of the proposed development 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. The need for more specialists if necessary will further be discussed with the lead authority.

The findings of the investigations, comments from affected and interested stakeholders are documented in this report together with the specified recommendations. Based on the investigations, no critical flaws that would impede the development have been identified at this point in time.

No potential fatal flaws were identified during the scoping phase that would necessitate substantial redesign or termination of the project. The main impacts are outlined below, and mitigation

recommendations and a summary of site suitability and residual impacts will further be detailed during the EIA phase.

The key issues identified during the Scoping process and to be assessed in detail during the EIA phase are as follows:

- Impact on the Socioeconomic;
- Impacts on flora and fauna (Sensitive Ecology);
- Impacts on heritage and archaeology;
- Visual Impact; and
- Impact on Avifauna

These issues were raised by the interested and affected during the Draft Scoping review and public meetings. These issues will be addressed in detail during the EIA phase wherein specialist input will be solicited.

Following the acceptance of the Scoping Report by the authorities, the following will be the recommended way forward:

- All participating stakeholders are to be notified of the conditions of the relevant authority for proceeding with the EIA;
- Execute the Plan of Study for the EIA phase of the project; and
- Address recommendations made by the authorities



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