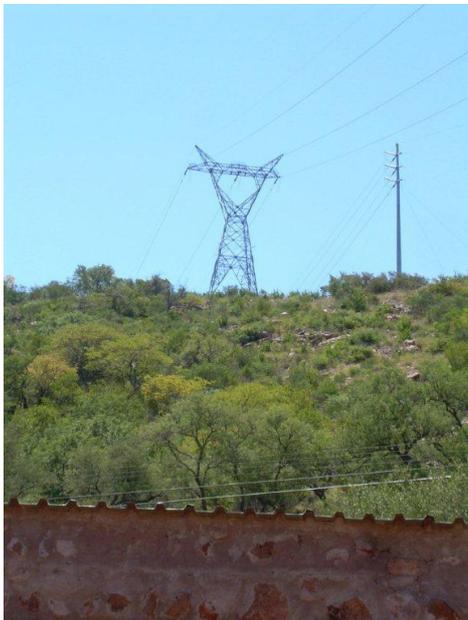


# Eskom Holdings SOC Limited



## Environmental Impact Assessment for the Proposed 1x400kV Tabor-Bokmakirie (Nzhelele) and 4 X 250MVA 400kV/132kV Nzhelele Main Transmission Station, Limpopo Province

### SOCIO-ECONOMIC IMPACT REPORT



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#### Lidwala Consulting Engineers (SA) (Pty) Ltd

**Randburg Office:**  
11th Church Avenue, Ruiterhof, Randburg, 2194,  
PO Box 4221, Northcliff, 2115.  
Tel: 0861 543 9252

**Pretoria Office:**  
1121 Hertzog Street, Office F005, Waverley, Pretoria, 0186,  
PO Box 32497, Waverley, Pretoria, 0135,  
Tel/fax: 0861 543 9252

**Polokwane Office:**  
128 Marshall Street, Amy Park no. 5, Polokwane  
PO Box 3558, Polokwane, 0700  
Tel: 0861 543 9252

**Nelspruit Office:**  
39 Emkhe Street, Nelpruit, 1200  
PO Box 2930, Nelspruit, 1200  
Tel: 0861 543 9252

## TABLE OF CONTENTS

1.	Introduction	5
1.1.	Methodology	5
2.	Social impacts expected during all project stages:	5
3.	Description of the socio-economic setting – demographic information regarding the area in which the proposed line will be constructed:	6
3.1	Demographic profiles	7
3.2	Economic activities, Tourism and farming:	9
3.2.2	Tourism	9
3.2.3	Farming in the MLM	10
3.3	Employment rates and livelihoods	12
3.4	Access to services	12
3.4.1	Electricity	12
3.4.2.	Access to water and sanitation facilities	13
3.4.3	Waste management	14
3.4.4	Transport	14
3.4.5	Educational facilities and libraries	14
3.4.6	Health facilities	15
3.4.7	Telecommunication and Postal Services	15
3.5	Conclusions from the social and economic environment within which the new power line is planned	16
4.	General Impacts Envisaged:	16
5.	Discussion of the power line alternative corridors	18
6.	Route Preference Rating from a socio-economic point of view	19
7.	Possible mitigation measures	22
8.	Conclusion	27
9.	References	28



## LIST OF FIGURES

<b>Figure 1:</b> Makhado Local Municipality within the context of the Vhembe District Municipality (Vhembe District Municipality, 2012) .....	7
<b>Figure 2:</b> Distribution of households by type of main dwelling and municipality 2001 and 2011 (Statistics South Africa, 2011) .....	9
<b>Figure 3:</b> Change in stock farming to game farming between 1964 and 2007 (Du Toit, 2007; Carruthers, 2008).....	11
<b>Figure 4:</b> Area of game farms with valid permits in South African provinces in 2000 (Van der Merwe & Saayman, 2004:104 in Carruthers, 2008).....	11
<b>Figure 5:</b> Distribution of households using electricity for heating, cooking or lighting (Statistics South Africa, 2011) .....	13
<b>Figure 6:</b> Distribution of households with a radio, television, refrigerator, computer, cell phone, landline/ telephone and access to internet by municipality – 2001 and 2011 (Statistics South Africa, 2011) .....	15

## LIST OF TABLES

<b>Table 1:</b> Distribution of population by age and sex, Makhado municipality-1996, 2001 and 2011	8
<b>Table 2:</b> Distribution of the Municipality’s Employment Sector	13
<b>Table 3:</b> Distribution of the population aged between 15 and 64 years by employment status – 2001 and 2011	13
<b>Table 4:</b> Number of households receiving free basic electricity from the municipality and from Eskom	13
<b>Table 5:</b> Distribution of the population aged 20 years and older by highest level of education attained, sex and municipality – 2001 and 2011	16
<b>Table 6:</b> Socio economic Criteria for Route Preference Ratings	29
<b>Table 7:</b> Final Site Ranking Matrix	29
<b>Table 8:</b> Power line routes and their preference rates	31

## **1. Introduction**

The purpose of the Socio-economic impact assessment was to conduct a systematic analysis of the likely impacts that the project will have on the day-to-day life of individuals and communities within the study area. The assessment will serve to identify issues that will need to be addressed by avoidance or mitigation, as well as social impacts that cannot be resolved. Recommendations regarding mitigation measures will be developed for inclusion in the EMP. The socio-economic impact assessment will also highlight potential positive impacts of the project, so that these impacts may be enhanced.

### **1.1. Methodology**

The Socio-economic specialist undertook desktop and initial studies during the scoping phase whilst detailed site investigations and impact evaluation was undertaken during the EIA stage. The following persons gave input to the whole process:

- Bongi Mhlanga – public participation, site visits and information input to process;
- Ntsebo Mofoka – report compilation and research socio-economic data;
- Frank van der Kooy – site visit and socio-economic verification process.

The documentation/publications used during the desktop studies included the Makhado Local Municipality (MLM) Integrated Development Plan (IDP), the Vhembe District Municipality IDP, the Census 2011, Municipal Report Limpopo, Locality Maps, Aerial Photographs and the EIA Scoping Report. In addition, site visits and Public Participation was undertaken and consultation with stakeholders enabled the project team to identify some important needs, expectations and perceptions regarding the proposed development. The information from these sources was used to determine what possible social-economic impacts a power line of this magnitude can have on the social environment.

## **2. Social impacts expected during all project stages:**

### **• Construction/Implementation**

The construction/implementation stage begins when a decision is made to proceed with the project and an EIA is called for. The likely impacts during the various phases can be described in summary. For typical construction projects, this involves clearing land, building access roads, developing construction camps, etc.

Displacement and relocation of people, if necessary, occurs during this phase. Depending on the scale of the project, the build-up of a migrant construction work force may also occur. If significant immigration occurs, the new residents may create a strain on

community infrastructure, as well as creating social stresses due to changing patterns of social interaction. Communities may have difficulties in responding to the increased demands on school, health facilities, housing and other social services. Further stresses may be created by resentments between newcomers and long-time residents, by sudden increases in the prices for housing and local services, and even by increased uncertainty about the future. When new projects are implemented, local economies and organizations may change, and old behaviour is replaced with new ways of relating to the environment and its resources. This will be evaluated with regard to this project to what degree this is foreseen to happen on the various alternative proposed corridors.

- **Operation/Maintenance**

The operation/maintenance stage occurs after the construction is complete and the project becomes fully operational. In many cases, this stage will require fewer workers than the construction/implementation phase. If operations continue at a relatively stable level for an extended period of time, effects during this stage can often be the most beneficial of those at any stage. Communities seeking industrial development will often focus on this stage because of the long-term economic benefits that may follow from a development. It is also during this stage that the communities can adapt to new social and economic conditions and the expectations of positive effects-such as stable population, a quality infrastructure, and employment opportunities, can be realized. In this case the Eskom depot might need to increase their maintenance staff due to the size of the power line.

- **Decommissioning**

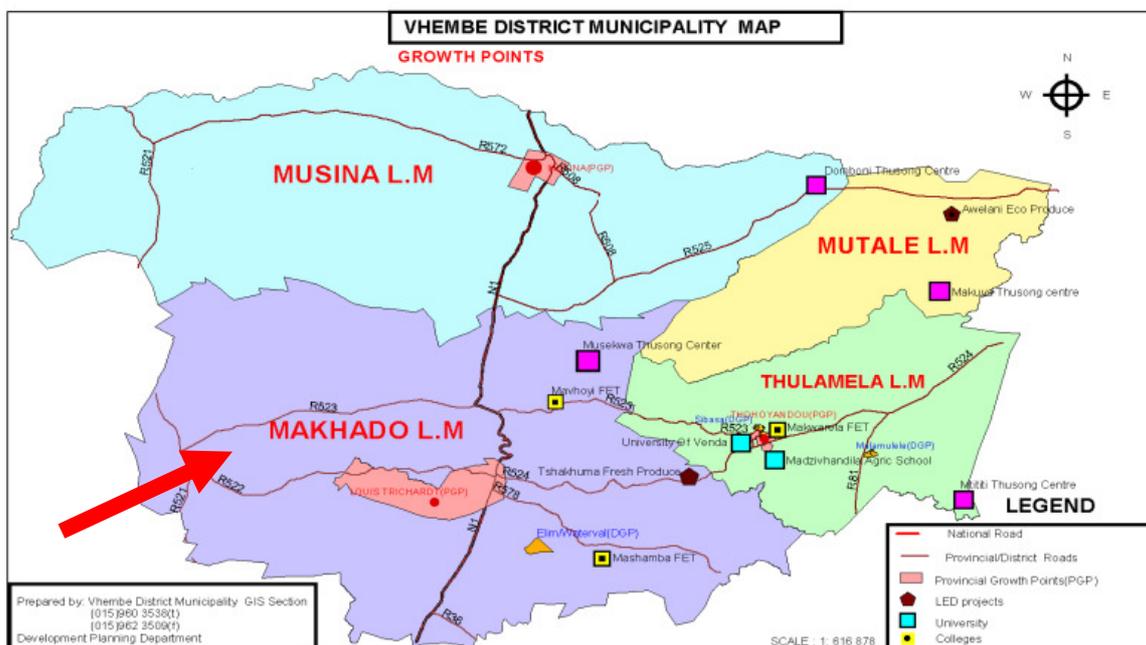
Decommissioning begins when the proposal is made that the project and associated activity will cease at some time in the future. As in the planning stage, the social impacts of decommissioning begin when the intent to close down is announced and the community or region must again adapt, but this time to the loss of the project. At other times, the disruptions to the local community may be lessened or at least altered if one type of worker is replaced by another but employment has actually increased as environmental clean-up or and rehabilitation specialists have been hired to help deal with the re-vegetation.

The impacts from a power line project will not be of the same magnitude as those described above which could be applicable to larger developments such as Power Stations. It however gives a general overview what can be expected social impacts are all about.

### **3. Description of the socio-economic setting – demographic information regarding the area in which the proposed line will be constructed:**

Information was obtained from the sources discussed in the Methodology Section of this report in Section 1.1.

The proposed power line will be constructed within the MLM which is located in the northern part of the Limpopo province of South Africa along the N1 route and forms part of the Vhembe District Municipality. Adjacent to the MLM and also within the Vhembe District Municipality are the Mutale, Musina, and Thulamela Local Municipalities. The MLM's seat is in the town of Louis Trichardt. Other towns within MLM include Alldays, Bandelierkop, Nzhelele, Buysdorp, Tshipise, Tshitale Levubu, Elim, Hlanganani and Vuwani. The Municipality's size is 8567, 38 km<sup>2</sup> (or 856 738ha) in size and is categorised as a Rural Municipality with 67 persons/km density.



**Figure 1:** Makhado Local Municipality within the context of the Vhembe District Municipality (Vhembe District Municipality, 2012)

The MLM was named after a 19<sup>th</sup> Century VhaVenda King, Tshilwavhusiku Makhado Ramabulana., who by his death in 1897, had led in the prevention of the Afrikaners who were encroaching onto his Kingdom. The Afrikaners did however eventually overpower the Venda and established the town of Louis Trichardt. On the 31st October 1934, the Louis Trichardt Town Council as a municipality was founded but the name was later changed to the MLM. A statue of King Makhado has been erected in Louis Trichardt (Makhado Municipality, 2012 (b)).

### 3.1 Demographic profiles

According to Statistics 2011, the population of MLM is 515 414 comprised of 279 103 females and 236 411 Males. There is an estimated 1.4% increase in the

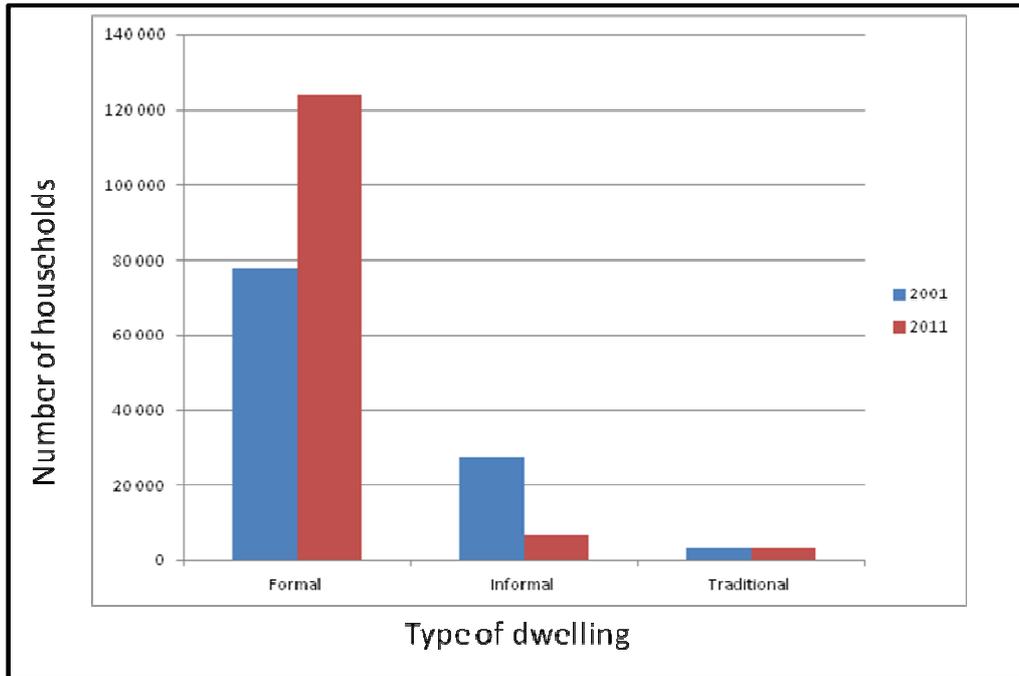
population size per annum. The MLM has more females than males. This could be attributed to the migration of males to places outside the municipality in search of employment opportunities.

Black Africans comprise a large number of the municipal population at 502 123 in comparison to lowest population group of Indians/Asians at 151. About 50% of municipal households are headed by females and about 1.5% are headed by children.

**Table 1:** Distribution of population by age and sex, Makhado municipality-1996, 2001 and 2011 (Statistics South Africa, 2011)

LIM344: Makhado	1996			2001			2011		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	30 197	30 373	60 570	28 392	28 363	56 755	32 679	32 096	64 775
5-9	33 086	33 418	66 504	33 345	33 965	67 310	28 715	28 167	56 882
10-14	32 287	32 673	64 960	34 917	35 178	70 095	29 893	27 756	57 649
15-19	27 177	27 616	54 793	32 087	32 599	64 686	31 630	30 022	61 652
20-24	19 041	22 095	41 136	20 260	24 256	44 516	24 343	24 366	48 709
25-29	12 439	16 525	28 964	14 127	20 406	34 533	17 107	20 647	37 754
30-34	10 103	15 051	25 154	11 226	16 310	27 536	13 304	17 916	31 220
35-39	8 089	12 752	20 841	10 159	15 279	25 438	11 313	16 741	28 053
40-44	6 600	10 538	17 138	8 013	12 999	21 012	9 963	14 523	24 486
45-49	4 971	7 998	12 969	6 627	11 106	17 733	8 897	13 336	22 233
50-54	3 693	5 780	9 473	5 359	8 052	13 411	7 126	11 629	18 755
55-59	3 170	5 567	8 737	3 786	5 508	9 294	6 095	9 220	15 315
60-64	2 511	7 142	9 653	3 337	6 033	9 370	4 617	6 809	11 426
65-69	3 032	7 323	10 355	2 768	7 455	10 223	3 316	6 355	9 671
70-74	1 994	3 922	5 916	2 796	7 009	9 805	3 230	5 297	8 528
75-79	1 825	4 389	6 214	1 480	3 196	4 676	1 732	5 649	7 381
80-84	774	1 919	2 693	1 231	3 431	4 662	1 337	4 556	5 894
85+	613	1 816	2 429	762	2 445	3 207	1 114	4 018	5 132
<b>Total</b>	<b>201 604</b>	<b>246 899</b>	<b>448 503</b>	<b>220 674</b>	<b>273 589</b>	<b>494 263</b>	<b>236 411</b>	<b>279 103</b>	<b>515 514</b>

Within the MLM, there are a greater number of people living in rural areas than in the urban areas. The three main types of dwellings are the formal, traditional and the informal. Although there has been an increase in the number of formal dwellings, rising from 77 640 in 2001 to 123 950 in 2011, some of these houses fall below the RDP standard. Current housing backlogs are being worsened by the increase in population within the municipality. There was however a decrease in the number of traditional dwellings, from 123 950 in 2011 to 77 640 in 2012 and a minor increase in the number of informal dwellings, from 3 277 in 2001 to 3 473 in 2011.



**Figure 2:** Distribution of households by type of main dwelling and municipality 2001 and 2011 (Statistics South Africa, 2011)

### 3.2 Economic activities, Tourism and farming:

#### 3.2.1 Economic activities

The MLM is comprised of what can be termed a “dual economy”. This is because the informal economies in the rural areas and townships and agriculture form one part of the economy and the more “advanced” sectors of the economy such as banking, manufacturing, government services and trade form another part of the economy. Agriculture accounts for the largest percentage share of all sectors within the MLM, followed by the electricity and Construction sectors. In future, mining is likely to form a large part of the MLM’s Gross Geographical Product (GGP) as Rio Tinto has confirmed that coal deposits are available within the municipality.

#### 3.2.2 Tourism

The tourism industry forms a small part of the Municipal economy in comparison to other sectors although this sector is well organised and comprised of community tourism associations (CTA’s) which are the Nzhelele, Tshakhuma the Soutpansberg Ribolla and the community tourism associations and are collectively known as the Makhado Tourism Initiatives. MLM has great tourism potential which the municipality is, through tourism and marketing programmes, working to improve as a means of developing the economy of the area. However, factors such as the MLM’s poor infrastructure are hindering these endeavours (Makhado Municipality, 2012 (b)).

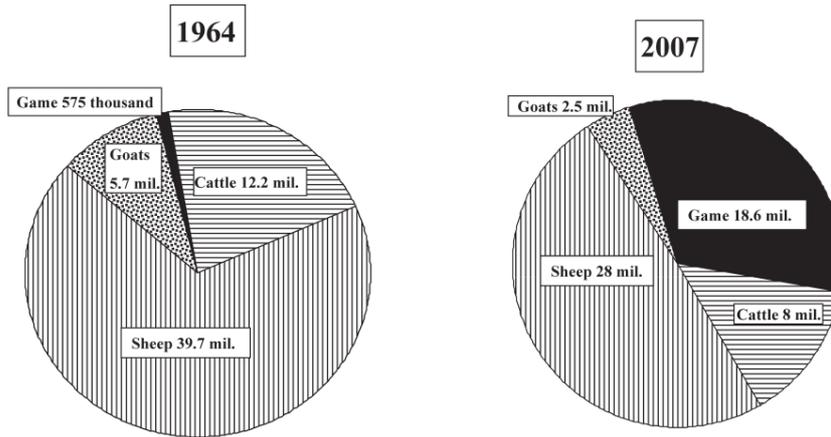
Areas such as the Soutpansberg Mountain Range, the Ben Lavin Nature Reserve, the Schoemansdal Museums as well as activities such as game farming, attract tourists. In addition, there are future plans to establish the Soutpansberg Conservancy with several registered heritage sites and natural areas of beauty could contribute and become a major boost to the tourism sector. The area around the Middle Letaba Dam, which falls within the MLM and the Greater Giyani municipality, is envisioned to have waterside facilities (Makhado Municipality, 2012 (b)).

Tourism as well as Mining and agriculture form the a large part of the Limpopo Province Economy (Limpopo Department of Economic Development, Environment & Tourism (LDEDET) 2009) and specific to the MLM, tourism is of such great importance to the economy of the municipality that it forms part of the its' mission which states that it is "To ensure effective utilisation of economic resources to address socio-economic imperatives through mining, tourism and agriculture" (Makhado Municipality, 2012 (a) p. 68).

### 3.2.3 Farming in the MLM

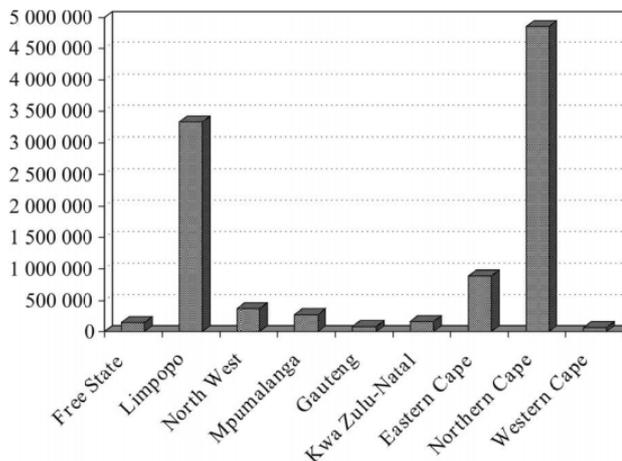
This is mainly comprised of crop farming, stock and game farming.

- Crop Farming  
Within the MLM, cultivated crops include mangoes, avocados, litchis, tomatoes and bananas. (SA Places, 2012; Makhado Municipality, 2012 (a). The MLM also recognises other the opportunities in crop farming such as organic farming and nut processing and packaging plants (IDP).
- Stock farming  
Goats and sheep are reared in the MLM and do well fetching prices of approximately R600 and R800 respectively. Stock farming is however threatened by aspects such as stock thefts, high feed costs and diseases. (Vhembe District Municipality, 2012)
- Game Farming  
Game farming has largely replaced stock farming in large parts of South Africa and to a greater degree, in the Limpopo province as well. This is because game farming is viewed as more financially rewarding than stock farming as it is a tourist attraction for activities such as hunting and also for meat. (Trade & Investment Limpopo, 2008; Carruthers, 2008, Furstenburg, 2010).



**Figure 3:** Change in stock farming to game farming between 1964 and 2007 (Du Toit, 2007; Carruthers, 2008)

In 2000, at a national scale, game farming areas in Limpopo comprised an area of approximately 3.3 million Hectares, second to the Northern Cape with approximately 4.8 million hectares. Other provinces have considerable smaller game farming areas. These statistics were however limited to game farms with authority permission and with a permit (i.e. those that are fenced according to national and provincial specifications) and the inclusion of non-permitted game farms could mean that the areas where game farming is taking place are larger. Out of a total of about 7 000 game farms in South Africa in 2000, 5 061 farms were permitted and approximately 63 000 people were employed in the game farming sector (Du Toit, 2007; Carruthers, 2008).



**Figure 4:** Area of game farms with valid permits in South African provinces in 2000 (Van der Merwe & Saayman, 2004:104 in Carruthers, 2008)

Within the MLM, statistics of game farms are not readily available but site visits and discussions with land owners have indicated that game farming is undertaken at a large scale.

### 3.3 Employment rates and livelihoods

Employment rates are higher for males than females. In 2011, 78 768 persons from the economically active group, e.g. between 15 and 65 years, were employed while 45 705 were unemployed. The unemployment rate in the economic active group is approximately 37 to 40%. Community service, Trade and Agriculture respectively, were the biggest employers in the MLM.

**Table 2:** Distribution of the Municipality's Employment Sector (Makhado Municipality, 2012 (a))

Sector	Population employed
1. Trade	17,817
2. Agriculture	15,250
3. Construction	5,515
4. Manufacturing	3,389
5. Finance	2,745
6. Transport	2,704
7. Electricity	480
8. Mining	453
<b>Total</b>	<b>53 378</b>

**Table 3:** Distribution of the population aged between 15 and 64 years by employment status – 2001 and 2011 (Makhado Municipality, 2012 (a))

Employed		Unemployed		Unemployment Rate	
2001	2011	2001	2011	2001	2011
59 445	78768	59 345	48 705	50,0	36,7

### 3.4 Access to services:

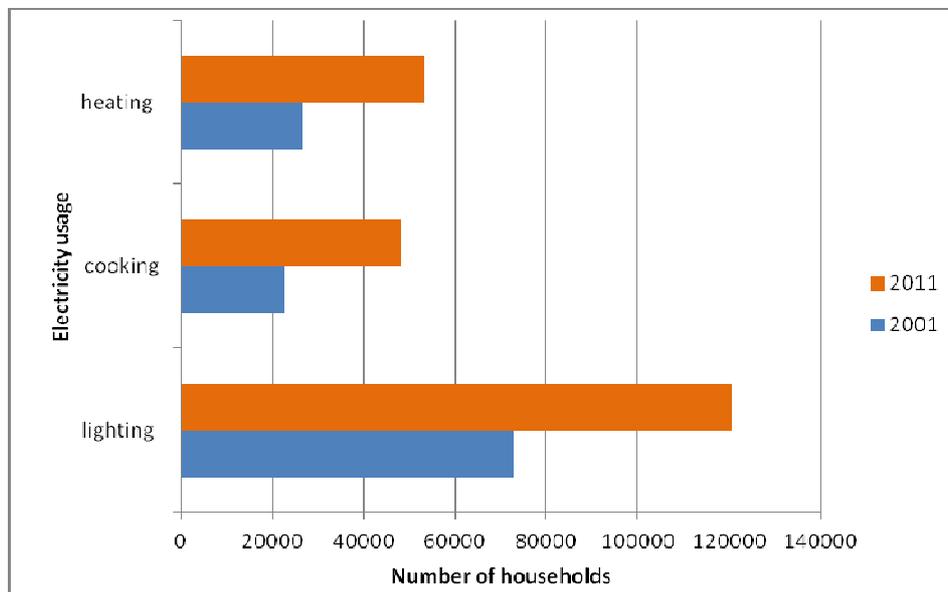
#### 3.4.1 Electricity

About 34 693 households within the municipality do not receive electricity. This could be caused by poverty, the lack of infrastructure or where this is available, poor maintenance or vandalism of the infrastructure. There is an inadequate provision of electricity to services such as health facilities and schools. Furthermore, numerous villages within the MLM such as Madabani, Muraleni, Midoroni and Manavhela do not have electricity connections. In households where electricity is available, the poor receive the Free Basic Electricity (FBE) offered by the municipality. As part of electricity distribution, the MLM is licensed to undertake the distribution in only certain areas while Eskom provides electricity directly to other areas (Makhado Municipality, 2012 (a)).

**Table 4:** Number of households receiving free basic electricity from the municipality and from Eskom (Makhado Municipality, 2012 (a))

Receiving free basic Electricity	
MLM	6 718
ESKOM	11 879
<b>TOTAL</b>	<b>19 340</b>

In 2011, approximately 221 957 households receiving electricity from the municipality used it for lighting, cooking and/or heating. This is a big difference when compared to the 122 171 households in the same situation surveyed in 2001.



**Figure 5:** Distribution of households using electricity for heating, cooking or lighting (Statistics South Africa, 2011)

#### 3.4.2. Access to water and sanitation facilities

In rural areas, water is sourced from communal taps and boreholes. About 305 935 of the MLM residents receive water that is below Reconstruction and Development Programme (RDP) standards. These RDP standards are comprised of the elements such as 20-25 litres per capita per day, 98% access time to a water source as well as the water source being located within 200m of the household.

There is a lack of proper sanitation facilities and pit latrines are constructed in most rural areas for households, despite the lack of proper knowledge of pit latrine construction which could be contributing to the high concentration of nitrates in the groundwater of most rural areas. In 2011, only 19 555 of the Municipality's households had chemical/flush toilets in comparison to 104 which had pit latrines, 748 who used a

bucket system and 8 986 who had no toilets. The municipality does however offer a free Basic Water and Sanitation to all poor household within their database.

The Blue Drop score for Louis Trichardt was not assessed in 2009, but was 54.13% in 2012. This is a higher score than that of the surrounding rural areas such as Nthabalala where the Sand Well System which in 2009 was 9.5% but improved to 13.25% in 2010 (Department of Water Affairs (DWA), 2010)

#### 3.4.3 Waste management

The MLM has one licensed landfill which is filled and plans are underway to open a new landfill. There is also one licensed transfer station and three that are unlicensed. Formal waste systems exist mainly in the Louis Trichardt area and in the municipality's rural areas, there is a lack of proper waste disposal facilities and illegal dumping occurs. This leads to the burning of waste and the contamination of water sources as a result of poor waste management practices.

#### 3.4.4 Transport

The N1 highway runs through the MLM serving as the main link between South Africa and Zimbabwe. There is also a railway connection that transports good and passengers and also connecting South Africa with other Southern African countries, especially Zimbabwe.

In the rural areas of the municipality, the roads are mainly of gravel and the poor conditions are often worsened by rains. These are in contrast to roads in the towns, particularly the Louis Trichardt, which are not only tarred but have storm water management systems in place. There are road and storm water management systems backlogs which the municipality. This is currently getting attention from the municipality and some roads are being upgraded to tar from gravel.

#### 3.4.5 Educational facilities and libraries

Primary and secondary schools occur throughout the Municipality. The number of females classified as having no education is generally higher than those of Males. However, under the classification of a tertiary education, the number of males with a Post-Matric qualification is lower than those of females at 10 812 and 13 259 respectively. Library and satellite library services are available in most parts of the municipality including the rural areas.

**Table 5:** Distribution of the population aged 20 years and older by highest level of education attained, sex and municipality – 2001 and 2011 (Statistics South Africa, 2011)

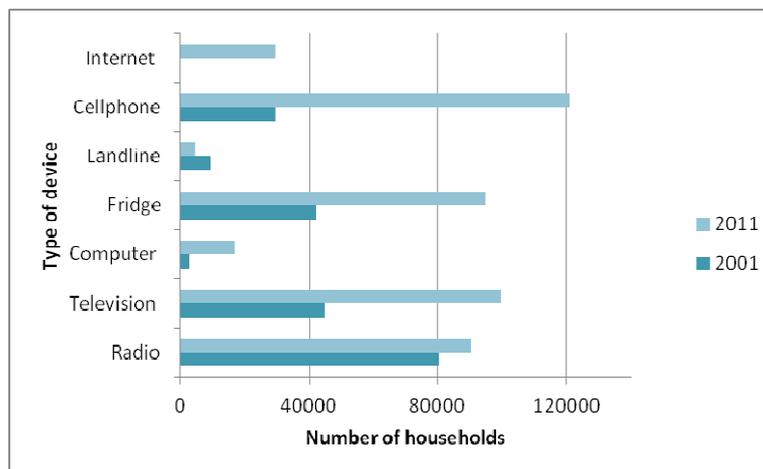
LIM344: Makhado	1996			2001			2011		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
No schooling	21 276	53 224	74 500	23 832	57 982	81 814	13 733	37 296	51 029
Some primary	9 644	12 427	22 071	12 577	15 758	28 335	12 318	16 420	28 738
Completed primary	4 886	7 254	12 139	5 554	7 440	12 994	5 205	7 038	12 243
Some secondary	23 253	29 844	53 096	26 973	35 372	62 345	41 299	52 686	93 985
Grade 12	12 200	13 017	25 218	14 977	18 056	33 032	26 005	33 454	59 459
Higher	5 577	4 474	10 051	8 018	8 877	16 895	10 812	13 259	24 072
<b>Total</b>	<b>76 836</b>	<b>120 239</b>	<b>197 075</b>	<b>91 932</b>	<b>143 484</b>	<b>235 416</b>	<b>109 373</b>	<b>160 153</b>	<b>269 526</b>

### 3.4.6 Health facilities

Healthcare facilities exist in most rural and urban areas of the MLM. There are four hospitals and approximately 43 clinics and seven Mobile Clinics. These health facilities are considered adequate to serve the increasing population as most facilities are faced by problems such as staff and medicine shortages, irregular electricity supply as well as overcrowding. The services of traditional healers are often used by some people to deal with health problems.

### 3.4.7 Telecommunication and Postal Services

Telephones infrastructure is lacking in most rural areas and where these are available, they are vandalised. Reception for cell phones and for television is problematic in most parts of the municipality. Cell phone usage increased from 44 749 in 2001 to 99 693 in 2011, and households with television increased from 29 531 in 2001 and 120 988 in 2011.



**Figure 6:** Distribution of households with a radio, television, refrigerator, computer, cell phone, landline/ telephone and access to internet by municipality – 2001 and 2011 (Statistics South Africa, 2011)

### **3.5 Conclusions from the social and economic environment within which the new power line is planned**

- Communities are scattered in the area within which the proposed activity is planned;
- Game farming, hunting, seems to be an increasingly important economic aspect in the MLM;
- The tourism potential is still largely untapped and game farming in the area contributes to a large percentage of tourism attraction;
- Trade and industry, normally the bulk electricity user, is the largest economic sector. There is no reason to believe that this changed significantly over the past few years;
- Unemployment rates are high in the MLM;
- The population increase and the rise of unemployment combined with the low levels of skills makes unskilled work highly important – new projects create expectations for the unskilled labour market;
- There are problems of electricity supply within the MLM and these must be rectified electricity problems which must be resolved in order to improve the lives of people as well as to aid in improving the economy of the MLM.

#### **4. General Impacts Envisaged:**

- Influx of job seekers, mainly unskilled labour, from communities around the power line route having job expectations
- Health impacts from construction sites and camps as a result of exposure to sewage waste, infectious diseases such as measles, TB and HIV/AIDS
- Conduct of construction workforce; Good relationships between community members/ farm workers and Eskom Construction workers can result in issues such as sexual misconduct and the spread of diseases
- Conduct of construction workforce; Bad relationships between community members/ farm workers and Eskom Construction workers leading to violence due to possible perceived stock theft etc.
- Theft of material from camps and construction sites
- Negative attitudes towards the project and the formation of community groups, NGO's, in response to the project
- Land owners denying contractors access to their properties
- Loss of crops leading to economic losses
- Loss of land leading to economic losses

- 
- Impact on farming activities such as sowing, harvesting, and fire management programmes
  - Impact on farming activities such as hunting in game farms leading to economic losses. Impacts can also be on guests in lodges leading to economic losses
  - Damage to farm infrastructure e.g. irrigation equipment, gates, fences
  - Security concerns as a result of poaching of game, stock theft and crop theft
  - Security concerns as a result of the presence of workers on properties and communities during construction and during the operational phase for maintenance
  - Safety of community members/farm workers/animals during construction and maintenance
  - Perceived electromagnetic fields impacts on humans and animals during the operational phase
  - Loss of sense of place/income on game farms – Tourists want to see Africa and power line can possibly disturb the rustic African setting;
  - Decrease in property values due to the visual impacts of power lines as well as the perceived impacts of electromagnetic fields on humans and animals;
  - Poor maintenance of the power line access roads: conflict between Eskom and the landowners on whose responsibility it is to do maintenance on these roads. Farmers use it more often but yet expect Eskom to pay for all maintenance
  - Impact of the power lines on aircraft as there are airports within the study area; one is the Louis Trichardt airport and the other is for light aircraft on the road towards Waterpoort from Louis Trichardt
  - Increase in the voltage stability
  - An assurance of a reliable electricity supply
  - Increase of electricity supply making it available for agriculture, tourism and other industries. The increase in electricity may also allow for the undertaking of other activities that may have been that may not have been possible prior to the improved supply of electricity
  - No more backlogs in electricity connections

- The inadequate provision of electricity to services such as health facilities will cease
- Numerous rural settlements such as Muraleni, Madabani, Midoroni and Manavhela that do not have electricity may have access to these services in the future

## 5. Discussion of the power line alternative corridors

**Tab-Nzh1;** Land use in this corridor comprises of game farming, irrigated agricultural lands, extensive avocado plantations and livestock farming. Sparse settlements such as Welteverede exist within this corridor. The corridor crosses the Ben Lavin Nature reserve at the western boundary (600m) and runs parallel to northern boundary for approximately 4km. This southern section of the corridor stops just before the mountain where alternatives **Tab-Nzh1b)** and part of **Tab-Nzh3;** transverses some sections against the lower slopes of the mountain. On the higher slopes, lower "Witflag" road and across the higher "Witflag" road and across the mountain, crop farms will be mostly affected by this route and the loss of cultivated land may lead to economic losses. Along the southern side of the mountain, avocados are cultivated in large quantities. The impact on the plantations will be worsened if the existing Eskom line route is not followed. Although the servitude needs to be widened, in the case where the existing Eskom route is followed to accommodate the new 400kV line, existing access roads can be used decreasing the expected negative impact..

**Tab-Nzh1a;** This proposed route within the corridor runs parallel to the existing Eskom 132kV line on the Northern section of the route for the last 13,1 km towards the proposed new Nzhelele substation. This area is comprised mainly of game farms.

**Tab-Nzh1b;** This route alternative within this corridor runs to the east of the Louis Trichardt town and is the closest to the town. Crop farms will be mostly affected by this route and the loss of cultivated land may lead to economic losses. Especially these sections on the Southern side of the mountain avocados are cultivated in large quantities. This will even be worse if the existing Eskom line route is not followed. Although the servitude needs to be widened to accommodate the new 400kV line, existing access roads can be used decreasing the real impact.

**Tab-Nzh2;** This links to the Tab – Nzh 4. This corridor is highly disturbed and is mainly used for mixed farming practices. Game Farms such as Shiawela Safaris will be affected by this route and the visual and other impacts such as those on animals may lead to economic losses. Some parts of the power line also runs along a railway track. Some communities, such as, will directly be affected. The social impact on communities and settlements can be negative if not managed.

**Tab-Nzh3;** The route runs along the eastern boundary of the Ben Lavin Nature Reserve. The southern side of the route runs through mainly game farming. On the northern side,

it comprises agricultural land and game farming, veld and residential area in the form of plats on the farm Vondeling.

**Tab-Nzh4;** The southern side of this route will affect numerous rural settlements such as Hamantsha, Schoemansdal, Madaheni and also the town of Waterpoort. This corridor has the most scattered communities within its vicinity. At least 11 communities will be affected all the way from Hamagau to Gamadulathoka on the southern side of the mountain. The economic impacts of the power lines could be positive in the sense that businesses in the area could benefit and new businesses could open leading to a slight increase in economic growth during construction. On the northern side of the mountain the power line will cross some game farms and possible economic losses can occur due to the change in character caused by the new infrastructure. It will also cross Waterpoort where a railway station is situated. Most of the rest of the line runs parallel to the railway line with mixed farming on both sides. The last section of approximately 10 km to the new substation will traverse pristine game farming area with no existing access routes to the specific the corridor.

**Tab-Nzh5;** The proposed corridor on the Waterpoort side of the mountain traverses mixed land uses such as crop cultivation and livestock. Part of the route along the R523 is used as game farming whereas the last part of the corridor for approximately 18 to 20 km runs through mainly game farming area with no existing access routes. This will affect the game farming business that is predominant in this area.

## **6. Route Preference Rating from a socio-economic point of view**

The evaluation and nomination of the preferred route from a socio-economic point of view involved an evaluation of each route and its rating in order of preference to the most preferred to the least preferred. The rating of each site was conducted according to the following system:

- 1 = Not suitable for development / No-Go (impact of very high significance - negative)
- 2 = not preferred (impact of high significance - negative)
- 3 = acceptable (impact of moderate significance - negative)
- 4 = Preferred (impact of low or negligible significance - negative)

The following guiding principles were then used in order to assess the power line routes.

Power lines should as far as possible;

- run through areas far from existing settlements
- run through areas that are not currently occupied by infrastructure or settlements
- not run through grazing lands
- run only through agricultural lands with low vegetation
- not run through plantations with large trees
- not run through stock farming areas

- not run through game farms rather on the borders of these
- not be constructed through Nature Reserves and protected areas, lodges and other areas that attract tourists but should rather be located on the borders of these
- should not run through areas earmarked for future developments
- to be located on the borders of densely populated areas area than through this areas
- must avoid areas with dense populations, where relocation may be necessary, must be avoided
- run only through areas with low population density
- follow the route of an existing power line
- follow existing linear structures e.g. roads, railway tracks

Each of these principles were then added to the rating system in a table format in order as indicated in **Table 6**.

**Table 6:** Socio-economic Criteria for Route Preference Ratings

Site preference Rating	Criteria
Preferred (4)	<ul style="list-style-type: none"> <li>• route follows an existing line to a some degree</li> <li>• route follows existing linear structures e.g. roads, railway tracks</li> <li>• through areas far from existing settlements</li> <li>• through fewer settlements than other routes</li> <li>• through areas with low population density</li> <li>• through areas not currently occupied by infrastructure or settlements</li> <li>• through grazing lands</li> </ul>
Acceptable (3)	<ul style="list-style-type: none"> <li>• through agricultural lands with low vegetation</li> <li>• on the borders of sparsely populated areas</li> <li>• through stock farming areas</li> </ul>
Not Preferred (2)	<ul style="list-style-type: none"> <li>• through orchards and plantations</li> <li>• through areas earmarked for future developments</li> <li>• on the borders of game farms</li> <li>• on the borders of nature reserves and protected areas, lodges and other areas that attract tourists</li> <li>• on the borders of densely populated areas</li> </ul>
No-Go (1)	<ul style="list-style-type: none"> <li>• dense populations where relocation may be necessary</li> <li>• through game farms</li> <li>• through nature reserves and protected areas, lodges and other areas that attract tourists</li> </ul>

**Tab-Nzh1;** This is the **preferred route** because of numerous criteria such as large parts of the proposed power line following an existing power line, the power line going through areas that are located far from existing settlements and through areas that have a low population density and some areas which are currently not occupied as indicated in **Table 6**. However as the route also goes through game farming areas as well as

avocado plantations and livestock farming areas, the potential adverse impacts can be mitigated against.

**Tab-Nzh1a;** This route is **acceptable**. Although this route runs through game farms which according to **Table 6** are No-go options, it meets a lot of other criteria that render it an acceptable route as indicated in **Table 7**. These include the proposed power line following an existing line, being located far from existing settlements and running through an area with a low population density.

**Tab-Nzh1b;** This route is considered a **no-go route**, although part of this route runs along an existing power line and this is preferred, numerous other factors indicate that this route would not be preferable. Factors such as how in some parts the power line may run through avocado plantations, is on the border of dense communities, is the closest route to the highly populated Louis Trichardt town which may in future expand makes this route the least preferred. The possible future expansion of the town may result in negative effects such as exposure to electromagnetic fields. Furthermore, due to the close proximity of the route to the town, during the construction phase of the project, there could be a high influx of job seekers.

**Tab-Nzh2;** This route is considered **acceptable**. Although this route runs through game farms which according to **Table 6** are No-go areas, it meets a lot of other criteria that render it acceptable as indicated in **Table 7**. These include the proposed power line following an existing line and running through an area with a low population density, the rural areas of Hamagau, as well as running along an existing linear structure which for this route is a railway.

**Tab-Nzh3;** This route is **acceptable**. Although this route runs through game farms which according to **Table 6** are No-go areas, it meets a lot of other criteria that render it acceptable as indicated in **Table 7**. These include the proposed power line following an existing line, and running through plots of the farm Vondeling which area with a low population density.

**Tab-Nzh4;** This route is **not preferred**. Although the route follows an a linear structure and that being one of the criterion for a preferred route as indicated in **Table 6** ,the southern side of the route largely runs through or close to numerous rural settlements such as numerous settlements such as Hamantsha, Schoemansdal, Madaheni and also the town of Waterpoort. This route has the most scattered communities within its vicinity. The social impact on communities and settlements, particularly during the construction phase can be negative if not managed. As the power line also runs along areas with mixed farming as well as pristine game farming areas especially on the northern side, there will be a greater range of impacts on this route more than on any other as indicated.

**Tab-Nzh5;** This route is considered **acceptable**. Although the route will run through game farms, the route largely follows an existing linear structure which in this case is a road, the R523, there are few, if any, settlements along this route and in turn a low population density. This means that adverse impacts that would normally arise when a power line is constructed within communities will not exist.

The route preference results for each route were entered into a matrix and added together. The route with the highest value is considered the most preferable.

**Table 7:** Final Site Ranking Matrix for the Social Study

Study	Alt 1	Alt 1a	Alt 1b	Alt 2	Alt3	Alt 4	Alt 5
Social	4	3	1	3	3	2	3

Based on **Table 6** and **Table 7**, Tab-Nzh1 is the preferred route and Tab-Nzh 1b is the No-Go route.

## 7. Possible mitigation measures

These mitigation measures are a response to the environmental impacts envisaged and the social setting as described in **Section 3**. **Section 4** highlighted certain impacts envisaged and this section deals with certain possible solutions to those impacts identified. In certain cases two or three similar impacts are grouped, e.g. job creation and expectations within a community when a project starts.

- Influx of job seekers, mainly unskilled labour, from the communities around the power line route having job expectations
  - Identify all labour requirements before construction starts;
  - Identify possibilities and creation of a liaison desk 4 months before construction starts;
  - Communication strategy well in advance of project start.
  - Ensure that there is a Community liaison officer from affected communities and together with them study possibilities of jobs for community members e.g. vegetation clearing, food vendors
  - Where the jobs have been identified, these must also be formalised through issuing of permits to avoid conflicts within the community and to avoid loitering.
  - Where possible, ensure that all interested community members get an opportunity to work on the project during construction e.g. for vegetation clearing, each community member can be allocated a period of working and when this period elapses, other community members should be given an opportunity to also work and generate some impact.
  - Have clear rules and regulations for access to the camp / site office to control loitering. Consult with the local SAPS to establish standard operating procedures for the control and/or removal of loiterers at the construction site.

Ensure that community members are aware of the possible results of loitering before construction starts

- Health impacts from construction sites and camps as a result of;
  - Exposure to sewage;
    - Construction workers are prohibited from using their surroundings to relieve themselves
    - Pit latrines are prohibited on the construction camps or sites. Only mobile or portable toilets shall be used and these must be sufficient for all workers at a ratio of 1 toilet to 15 persons and provided with toilet paper.
    - The toilets shall be emptied and cleaned regularly and the contractor shall ensure that waste is not spilled. This can be done through measures such as covering the ground with a water proof material. Furthermore, the toilets and their tanks shall be serviced on a regular basis and where necessary replaced.
    - Construction workers are required to be treated for worms
  - Waste
    - Littering on site should be prohibited and the ECO should inspect this
    - Fines could be implemented for littering”
    - Waste shall be collected at regular intervals in sealed containers that will be removed from site and camps before overflowing. The containers will then be disposed of at recognised facilities. The waste shall be separated before removal from the site and any reusable or recyclable waste identified.
  - HIV/AIDS
    - An intense HIV/AIDS and STI awareness campaign should be launched. These should be directed at all construction workers and communities as well.
    - “Condoms should be distributed by placing them at centrally located points and by ensuring that construction workers and community members are aware of the availability and location of condoms. The distribution of condoms should be approached with the necessary cultural sensitivity”.
    - Local women who may form relationships with construction workers should be empowered through measures such as job creation on the project as this will result in them becoming financially independent and in turn reduce their likelihood of having relationships with construction workers in return for financial favours.
    - Access at the construction site should be controlled to prevent sex workers from either visiting and/or loitering at the construction village.
  - Other diseases e.g. TB, measles
    - All construction workers should be treated for these and proof of this should be retained.

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- Conduct of construction workforce; Good relationships between community members/ farm workers and Eskom Construction workers can result in issues such as sexual misconduct and the spread of diseases;
    - In the Environmental Management Plan (EMP) ,state that no unauthorised personnel are to enter the site without permission from the site officer/ Environmental Control Officer (ECO)
    - An Environmental Control Officer (ECO) must be appointed to ensure contractors conduct themselves in an appropriate way. A fining system for non-compliance must be set in place
  
  - Conduct of construction workforce;\_Bad relationships between community members/ farm workers and Eskom Construction workers leading to violence due to possible perceived stock theft etc.;
    - In the Environmental Management Plan (EMP) ,state that no unauthorised personnel are to enter the site without permission from the site officer/ Environmental Control Officer (ECO)
    - An Environmental Control Officer (ECO) must be appointed to ensure contractors conduct themselves in an appropriate way. A fining system for non-compliance must be set in place;
    - Liaising with the local police and having security personnel on the site will ensure that any possible eruption of violence can be avoided
  
  - Theft of material from camps and along construction sites
    - Fencing shall be erected around the construction camp and access shall be controlled through a lockable gate and security personnel. The fence shall be constructed of high quality material bearing the SABS mark. Furthermore, the fence shall be inspected on a daily basis and any damages should be fixed as soon as it is practicable. To increase security, shade cloth can be attached to the fence and similar to the fence, shall be inspected daily and fixed as soon as it is practicable. Storage facilities shall be lockable.
    - In addition to the above, all persons or vehicles entering or leaving the construction camp shall be subjected to a search
    - At each site, ensure that there is security personnel
  
  - Negative attitudes towards the project and the formation of community groups, NGO's, in response to the project;
    - Ensure that there is on-going communication with the affected parties and provide contact details of persons that they can contact should they have queries or comments about the project
    - Highlight the benefits of the project.
  
  - Land owners denying contractors access to their properties
    - There must be communication with landowners in regards to procedures for entering onto farms

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- Eskom must ensure that land owners are informed of the construction dates as well as dates for maintenance
  - Loss of crops leading to economic losses;
    - Ensure that construction takes place when the land is fallow and with no crops
    - Where possible, power line towers should be located along the boundary of the farm to lessen the loss of crops
    - Where power lines can't be placed along property boundaries, ensure that construction takes place when the land is fallow and with no crops
    - Discuss with land owners that the loss of land will only be during the construction phase as some activities such as crop farming can still occur below the power line after construction has ended
  - Loss of land leading to economic losses;
    - Where possible, power line towers should be located along the boundary of the farm to lessen the loss of land
    - Discuss with land owners that the loss of some land may be temporary and will only be during the construction phase as some activities such as crop farming can still occur below the power line after construction has ended; in addition after construction, land will be rehabilitated to as close as possible to its original status
    - Where the loss of land is permanent, Eskom should discuss compensation with landowners
  - Impacts on farming activities such as sowing, harvesting, and fire management programmes leading to economic losses
    - Construction should not take place during seasons when there is likely to be high activity on farms e.g. In the case of sowing, construction can occur before this happens, and in the case of harvesting, construction can occur after this has taken place.
  - Impact on farming activities such as hunting in game farms leading to economic losses. Impacts can also be on guests in lodges leading to economic losses.
    - In game farms, maintenance can be undertaken outside the hunting season.
    - In lodges, maintenance can be undertaken during low peak seasons and this can also be extended to weekdays when guests are likely to be fewer.
  - Damage to farm infrastructure e.g. irrigation equipment, gates, fences
    - Where possible towers should be placed on the edges of farm boundaries and along any existing roads as infrastructure is likely to be minimum or absent with the exception of farm fences and gates which if damaged by contactors should be fixed.
    - Where possible, farm infrastructure can be moved for the duration of construction; where this is not possible, the power line route can be altered to avoid the damage to the infrastructure

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- Security concerns as a result of poaching of game, stock theft and crop theft;
    - Construction should only take place outside the hunting season
    - Where possible, animals should be fitted with tracking devices or placed in secure enclosures for the duration of construction.
    - Land owner can also appoint guards to ensure that construction workers and their equipment are inspected prior to leaving the property.
  
  - Security as a result of the presence of workers on properties and communities during construction and during the operational phase for maintenance
    - In general, access to farms must be according to AgriSA's Protocol for access to farms must be adhered to
      - Advice landowners and community members about construction and maintenance dates
      - Advice landowners and community members about the number of workers expected
      - Upon arriving in a community or farm, workers must inform the community leader and farm owners or managers respectively
      - Ensure that construction workers are easily identifiable by construction uniform with logos and identification cards with logos and a photograph of the worker. Construction vehicles must also be marked
      - Construction workers should also carry their Identity documents with them and the land owner should be allowed to inspect these
      - The landowner should be allowed to check the identification cards and note the names of construction workers present on site.
      - Provide the landowners and community members should be provided with contact details of Eskom and the local SAPS to report any suspicious behaviour on their property as well as the presence of what seem to be unauthorised
  
  - Safety of community members/farm workers/animals during construction and maintenance
    - Ensure that the construction sites and camps are fenced off and signage, in local languages, placed in a conspicuous place near the construction sites
    - Liase with community leaders/farm owners to ensure that they warn community members/farm employees of the possible dangers of moving close to the construction sites
    - Ensure that animals are secured during construction for their safety as well as that of construction workers
  
  - Perceived electromagnetic fields impacts on humans and animals during the operational phase
    - Inform communities and landowners about the perceived impacts of power lines

- Ensure that there are no developments below the power line so that although adverse impacts are uncertain, communities are not placed at risk.
- On farms ensure that no buildings either for human or animal habitation are placed below power lines
- Loss of a sense of place/income on game farms – Tourists want to see Africa and the power line can disturb the rustic African setting;
  - Plan construction in those parts so that hunting season is avoided;
  - Choose those corridors that will have the least impact on the gaming industry;
  - Construction camps should not be placed in or close to game farm areas
- Decrease in property values due to the visual impacts of power lines as well as the perceived impacts of electromagnetic fields on humans and animals
  - Vegetation can be used to screen the power lines
  - Other measures can be discussed with Visual Impact Specialist
- Poor maintenance of the power line access roads: conflict between Eskom and the landowners on whose responsibility it is to do maintenance on these roads. Farmers use it more often but yet expect Eskom to pay for all maintenance
  - Put a firm negotiated contract in place during the operational phase
- Impact of the power lines on aircraft as there are airports within the study area; one is the Louis Trichardt airport and the other is for light aircraft on the road towards Waterpoort from Louis Trichardt
  - Information not available on Louis Trichardt airport. National aviation should provide information on seriousness of this issue;
  - Consult legislative restrictions and possible permit application.
  - Ensure that power lines are clearly visible to aircrafts;
  - Distribute information on the presence of new power lines to relevant air transport organisations

All the impacts for the various power line routes were assessed as indicated in Appendix 1.

## **8. Conclusion**

The proposed Eskom power line will result in possible socio-economic impacts in large parts of the MLM. The impacts are both positive and negative. This report has outlined the socio-economic setting of the proposed study area, discussed possible impacts (both positive and negative) and suggested mitigation measures. The report has highlighted that the high presence of farms, particularly game farms along power line routes may suffer high economic losses which will most likely affect the economy of the MLM. In addition to this, routes that run through communities are likely to have the highest social impacts due to the high expectations of jobs against the background of low employment

rates in the MLM. Positive impacts have also been discussed in this report and are inclusive of an increase in the voltage stability and the availability of electricity to numerous rural villages.

In terms of the route preference rating, Tab-Nzh 1b was considered to be the No-Go route because of characteristics such as the power line being located close to a high density area of the Louis Trichardt town and also running through extensive plantations that could lead to high economic losses should a power line be constructed through them. Tab-Nzh1 was considered to be the preferred route due to numerous factors which include the power line running through areas that are located far from existing settlements and through areas that have low human populations and the southern part of the line largely running parallel to an existing line and in turn reducing possible negative impacts

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