

**PROPOSED ESTABLISHMENT OF THE ANDERSON DINALEDI  
400kV TRANSMISSION LINE BETWEEN THE PROPOSED NEW  
ANDERSON SUBSTATION (BROEDERSTROOM) AND THE  
DINALEDI SUBSTATION (BRITS), NORTH WEST AND  
GAUTENG PROVINCES**

**DRAFT SOCIO-ECONOMIC IMPACT ASSESSEMENT REPORT**

**September 2012**



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## Executive Summary

Nemai Consulting was appointed by Eskom as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment for the proposed establishment of the Anderson 400kV substation. A Socio-Economic Impact Assessment was carried out to determine the potential impacts of the proposed substation on the receiving environment.

Eskom Holdings Limited is proposing the construction of a new 400kV Transmission Line, and a proposed new 400kV Substation as part of their Tshwane Strengthening Scheme Project. The proposed powerline will be approximately 40km in length and will be designed to strengthen the current electricity supply and ensure a sustainable supply of electricity.

The proposed Anderson substation is located in the Gauteng Province in the City of Tshwane Local Municipality. The site lies close to the border between Gauteng Province and the North West Province on Portions 82, 83 and 76 of Farms Schurveberg 488 JQ. This is a privately owned land that is used for residential purposes.

A status quo of the surrounding area of the site was conducted using data from Statistics South Africa Census 2001. It is the most comprehensive data set that is available as it divides statistics by geographical area and sub places. The following sub places were used to conduct the status quo:

Sub-Place	Local Municipal Area	Province	Powerline Route Traversing the Sub-Place
Brits NU	Madibeng Local Municipality	North West	All Routes
Rankotia	Madibeng Local Municipality	North West	Eastern Route Alternative
Ga-Rankuwa SP	Madibeng Local Municipality	North West	Eastern Route Alternative
Mothutlung	Madibeng Local Municipality	North West	Eastern Route Alternative
Magalies Nature Reserve SP	Madibeng Local Municipality	North West	Western Route Alternative
Damonsville	Madibeng Local Municipality	North West	Western Route Alternative
Pretoria NU	City of Tshwane Local Municipality	Gauteng	Eastern Route Alternative

It was found that the total population in the study area was 20 710 persons, of which there are slightly more males than females. Education levels in the study area are not promising as a majority of people have either received no schooling, some primary or some secondary. A majority of dwellings in the area are formal dwellings. The population in the study area are classified as low income earners, indicating vulnerability and poverty.

Land use on the alternative sites include the following: agriculture particularly in the southern region of the study area; mining due to the Eland Plantinum Mine; commercial activity mostly

located along the main roads; conservation and tourism due to the Magalies nature reserve and rural nature of the land; manufacturing and industry; residential land and vacant land.

The socio-economic impacts that were discussed in this report include the following

- ❖ Economic Impacts;
- ❖ Visual, Tourism and Leisure Impacts;
- ❖ Land value and Servitude;
- ❖ Loss of Production;
- ❖ Impacts on the social environment;
- ❖ Employment and skills transfer; and
- ❖ Roads and Traffic.

The proposed development will cause disruption during the construction phase, but as long as mitigation measures are carried out properly, these disruptions should have minimal lasting effect on the social and economic conditions of the proposed development.

# Title and Approval Page

**TITLE:** Socio- Economic Impact Assessment for the Proposed Establishment of the Anderson-Dinaledi 400kV Transmission Line between the proposed new Anderson Substation (Broederstroom) and the Dinaledi Substation (Brits), Gauteng and North West Provinces

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# DECLARATION OF INDEPENDENCE

The Independent Consultant

I, \_\_\_\_\_ declare that I –

- act as the Independent Consultant in this application for the proposed establishment of the Anderson Dinaledi 400kV transmission line between the proposed new Anderson (Broederstroom) and the Dinaledi Substation (Brits), North West and Gauteng Provinces
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the Environmental Impact Assessment Regulations, 2006;
- have and will not have any vested interest in the proposed activity proceeding;
- have no, and will not engage in, conflicting interests in the undertaking of the activity; and
- will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not.

Signature of the Consultant

**Nemai Consulting**

Name of company

\_\_\_\_\_

Date

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# 1 Introduction

The Medupi integration identified the need for the new 2 x Spitskop-Dinaledi 400kV lines to transmit power further into the grid beyond Spitskop. The Dinaledi Main Transmission Substation (MTS) is the main node to link the Waterberg generation and the Mpumalanga pools. Dinaledi MTS is connected by 400kV lines to Bighorn (Rustenburg), Apollo (Pretoria) and will be connected by 2x400kV lines to Spitskop (Northam). This meshed network will be linked to the Central Grid through the establishment of a new 400kV line from Dinaledi MTS to a new substation called Anderson.

The proposed Anderson substation will be located to in the City of Tshwane close to the boundary of Madibeng Local Municipality. The Dinaledi – Anderson 400kV line will transmit power from Dinaledi to the Central Grid and strengthen it. This will ensure that the transmission system north of Johannesburg, Brits and Rustenburg are heavily meshed thus improving the reliability of the Transmission system and sustain economic growth in the three areas.

This Socio-Economic Impact Assessment aims to identify the social and economic environment surrounding the project area and identify how this environment is to be impacted by the proposed project. This Socio-Economic Impact Assessment is a tool to be used in decision making processes by the relevant authorities which will decide whether the development will be socially, environmentally and economically sustainable

## 1.1 Methodology

The International Association for Impact Assessment (2003) states that Social Impact Assessment includes the processes of analysing, monitoring and managing the intended and unintended consequences of planned interventions (policies, programs, plans, projects) and any social change processes invoked by these interventions to create a more sustainable and equitable biophysical and human environment (Vanclay, 1999)

The analysis of impacts will be performed for two stages, the construction phase and operational phase. This will help to determine the loss/gain on welfare, as well as the extent of impact on the economy in the area.

SEIA is a methodology used to assess the social impacts and economic impacts of planned interventions or events, and to develop strategies for the ongoing monitoring and management of those impacts (International Association for Impact Assessment, 2003).

Social changes implemented through projects can multiply into more projects and change. These impacts and changes can either be positive or negative (Vanclay, 1999).

The methodology in this report was as follows:

### 1. Desktop analysis

Data collection by reviewing various relevant reports, including Integrated Development Plans and statistical data obtained from Statistics South Africa.

The Census 2001 data is the most comprehensive dataset available for the area, and despite it representing data that is eleven years old, it is currently the best data at hand. The analysis will be conducted using the Census 2001 sub place as the smallest geographic unit of measure. The sub places have been extracted using the project GIS, and the data for the affected sub places will be presented in the table and figures below.

Desktop analysis also involved looking at existing data and reports such as municipal Integrated Development Plans and other municipal reports.

### 2. Public Participation Process

The public participation process, undertaken by Nema Consulting further informed this study.

### 3. Site Visit

A site visit was conducted on the 4 September 2012 to determine the land use in the study area.

This Socio-Economic Impact Assessment will present the existing conditions in the project development area thus providing baseline data of the area. A matrix to determine the significance of the project will be used.

All major impacts are analysed in the section to follow with regard to their nature, extent, magnitude, duration, probability and significance.

The study area is defined as a one thousand meter wide corridor along each of the route alternative. This approach is taken to by the project planners to allow the final routing to be determined after environmental authorisation for the project has been obtained. The final

route layout, comprising a servitude of fifty five meters, will be determined by reference to, amongst others, the findings of this report.

## **1.2 Assumption and limitations**

Undertaking a social impact assessment for a linear project such as the proposed 400kV Dinaledi – Anderson transmission power line is challenging due to the uncertain effects of transmission power line on health, property and livelihood of local community. The data currently available from Statistics South Africa carries with it certain limitations that will be reflected in this study. However, it must also be noted that the results of this study cannot be generalised and applied to the entire population across the whole area and, as is in the nature of social research, is restricted to the specific study area.

Below are the assumptions and limitations to the study:

- It is assumed that information related to the social environment obtained from the strategic documents of the affected areas such as North West Growth and Development Strategy (NWGDS) 2004/14; Gauteng Provincial Growth and Development Strategy (GPGDS) 2005; Growth and Development Strategy for the City of Tshwane Metropolitan (GDSCT) 2004/14; Madibeng Local Municipality Integrated Development Plan – Analysis, 2004 etc were accurate.
- Unless otherwise stated, the statistical data reflected in this report are from the 2001 Census data obtained from the Municipal Demarcation Board: [www.demarcation.co.za](http://www.demarcation.co.za) and South Africa Community Survey 2007; bearing in mind that the social- demographic profiles may have changed in the recent number of years.
- The width of the corridor when compared to the required servitude width, and the possibility that the servitude can be anywhere within the corridor, introduces significant variance and uncertainty into the socio-economic study, and impacts cannot be determined with a high degree of precision. Hence this report takes the approach of highlighting potential impacts and provides mitigations measures on how to reduce these impacts. Final route planning should take these recommendations into account.

## **1.3 Structure**

The structure of the report is as follows

- Section 1: An introduction to the project and methodology is provided
- Section 2: An overview of the project and project activities is detailed for understanding. The project location is identified.
- Section 3: A status quo of the project area is outlined. The regional context followed by a demographic and economic analysis is provided. The level of services present in the area as well as major economic activities described.
- Section 4: Social and Economic Impacts and Mitigation are outlined.

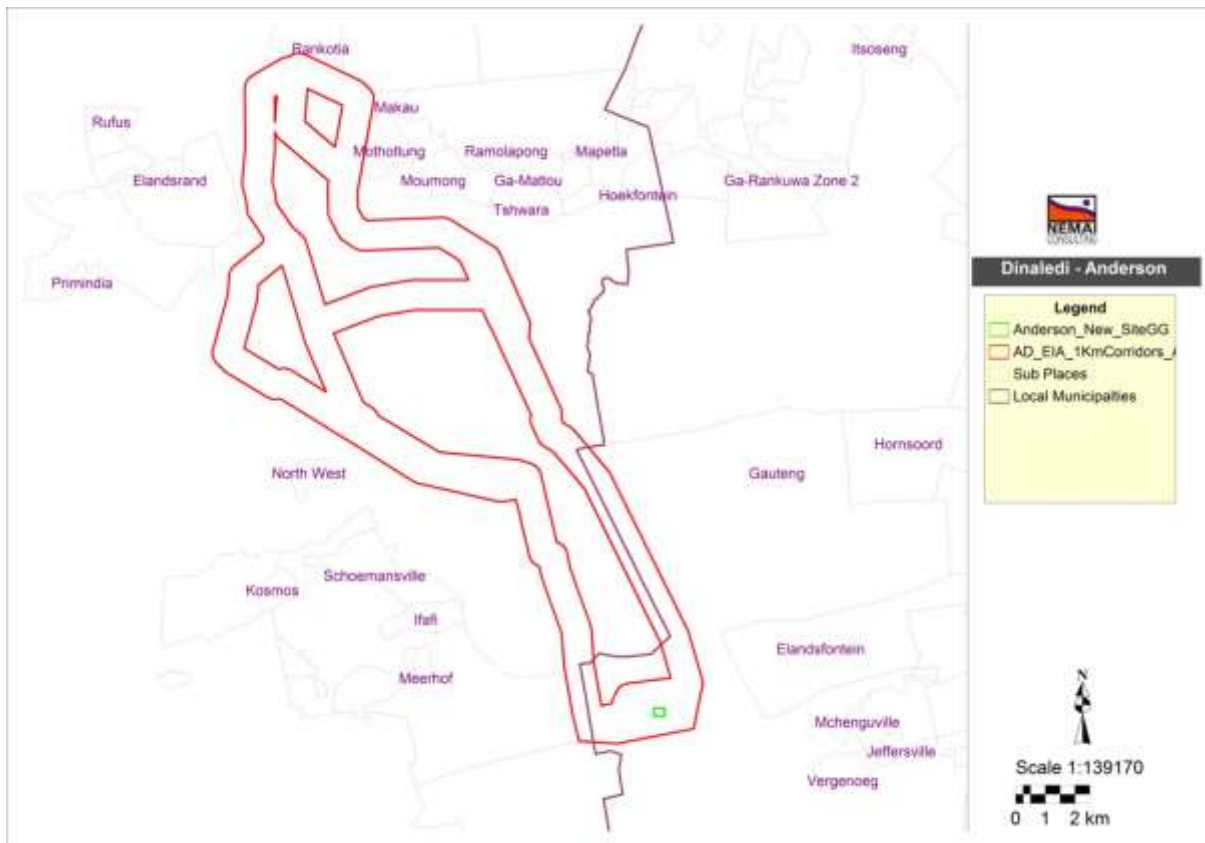
## **2 Overview of the Operation**

The Dinaledi Substation is located on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ, which is located approximately 8km North East of Brits. The Anderson Substation is located on Portion 82 of the Farm Weldaba 567 JQ, which is located in Broederstroom. Three power line routes have been identified by Eskom. A 1km buffer area has been placed around each route.

These buffer areas will be assessed during the Scoping and EIA phases to determine which route would be most suitable for power line construction, and to demarcate a corridor within the 1km buffer area of the preferred routes, which would be most appropriate for power line construction. Several properties are located within these 1km buffer areas.

The proposed power line will be approximately 40km in length and will run between the existing Anderson Substation, which is located on Portions 82, 83 and 76 of Farms Schurveberg 488 JQ in the City of Tshwane Metropolitan Municipality. The proposed power line will be constructed in the following two Municipal Areas: Madibeng Local Municipality, North West and City of Tshwane Metropolitan Municipality, Gauteng.

The site location can be viewed in the map below



**Figure 1 Location of project**

### **3 Description of the Social and Economic Environments**

This section seeks to contextualise the study by developing a socio-demographic profile that captures the relevant socio-economic characteristics of the areas directly affected by the proposed development. This information provides the reader in understanding of the possible social and economic impacts that may result from the proposed development on the social environment. The proposed 400kV Dinaledi – Anderson transmission power line falls within the jurisdictions of City of Tshwane Metropolitan Municipality in the Gauteng Province and Madibeng Local Municipality which forms part of Bojanala District Municipality in the North West Province.

This section will be analysed on two levels: at a provincial and local level. The socio-demographic, cultural, institutional and economic aspects that can be affected by the proposed development will be described. The discussions are based mainly on data provided by Statistics South Africa in respect of the 2001 Census and Community Survey

2007 as well as the Gauteng and North West's Growth and Development Strategies and City of Tshwane Metropolitan Municipality and Madibeng Local Municipality's IDPs.

### ***3.1 Regional and Local Context***

#### **3.1.1 North West Province**

The Madibeng Local Municipality, which houses the Dinaledi MTS, is found in the North West Province. The total population number of the North West Province is estimated at 3.043 million. The North West Province is home to 9.5% of South Africa's total population.

The North West Province has four district municipalities and twenty one local municipalities.

#### **3.1.2 Gauteng Province**

The City of Tshwane, which is to house the new proposed Anderson Substation is found in Gauteng Province.

The Gauteng Province is bounded to the north by the Limpopo Province; to the south by the Vaal River, which separates it from the Free State Province; to the east by the Mpumalanga Province and to the west by the North West Province.

The Gauteng Province is the smallest province in South Africa, with only 1.4% of the land area. The Gauteng Province covers an area of 16 548 km<sup>2</sup>. The province is highly urbanised containing the cities of Johannesburg and Pretoria. Although it is South Africa's smallest province, the Gauteng Province has the largest population, in 2007, of nearly 10.5 million, almost 20% of the total South African population.

The Gauteng Province comprises of three metropolitan municipalities and three district municipalities which are further divided into nine local municipalities.

The Gauteng Province is considered the fastest growing province, experiencing a population growth of over 20% between the 1996 and 2001 Censuses. The Gauteng Province is highly urbanised with 97% of its population living in urban centres.

### ***3.2 Defining the study area***

For a better understanding of the significance of the demographic issues, social and economic issues in the study area will be defined using Census 2001 subplaces.

The proposed routes for the power lines and associated 1km study corridor are located within seven sub-places in terms of the Census 2001 data. The sub-places and associated Local Municipality and Province are provided in the Table 1 below:

Sub-Place	Local Municipal Area	Province	Powerline Route Traversing the Sub-Place
Brits NU	Madibeng Local Municipality	North West	All Routes
Rankotia	Madibeng Local Municipality	North West	Eastern Route Alternative
Ga-Rankuwa SP	Madibeng Local Municipality	North West	Eastern Route Alternative
Mothutlung	Madibeng Local Municipality	North West	Eastern Route Alternative
Magalies Nature Reserve SP	Madibeng Local Municipality	North West	Western Route Alternative
Damonsville	Madibeng Local Municipality	North West	Western Route Alternative
Pretoria NU	City of Tshwane Local Municipality	Gauteng	Eastern Route Alternative

The Census 2001 data for each of the sub places will be used to describe the social and economic conditions of the project area. The map below indicates the proposed study area.

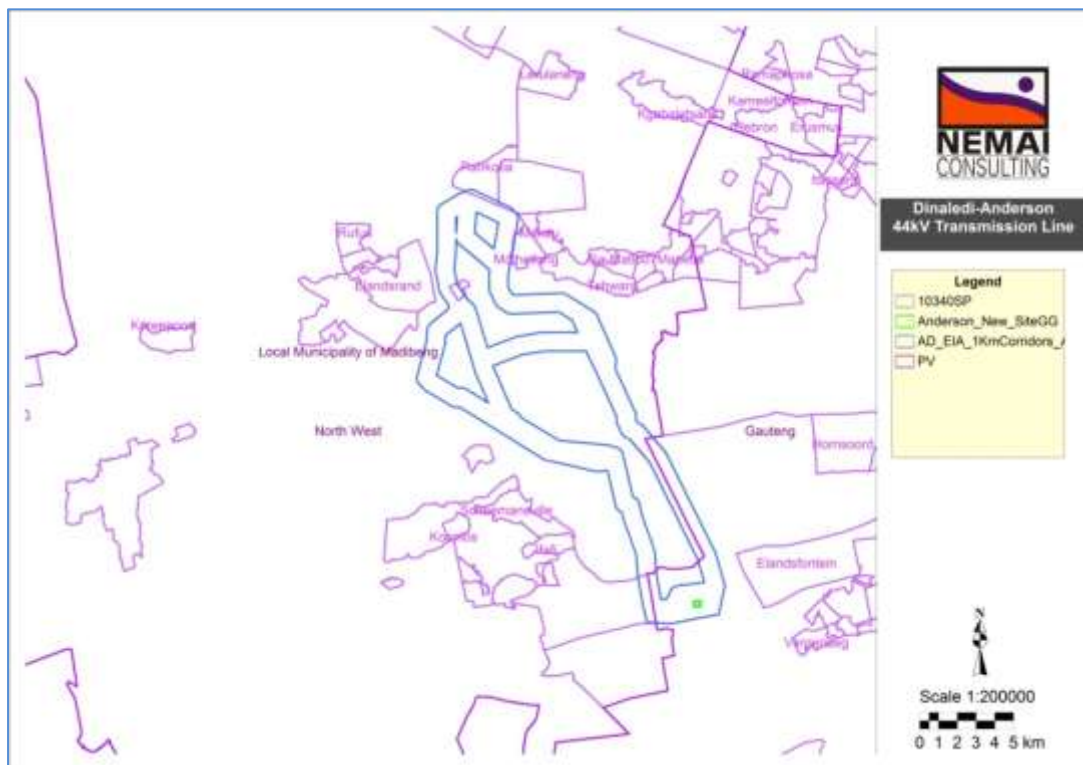


Figure 2: Locality Map

### 3.3 Livelihood Indicators

The following livelihood indicators help identify the socio-economic profile of the study area which may be affected by the proposed project.

#### 3.3.1 Population

The population in the study area totals 20 710. The Brits NU has the largest population of 12 188 while Ga-Rankuwa only has four persons.

**Table 1 Population figures for the study area (Statistics South Africa, 2001)**

Sub Place	Total
Mothotlung	2 727
Rankotia	144
Damonsville	415
Ga-Rankuwa	4
Brits NU	12 188
Magliesburg Nature Reserve	114
Pretoria NU	5 118
<b>Total</b>	<b>20 710</b>

Table two below shows the age and gender by number of people. There are more males than females in the area. The largest population group is that 19-39 years of age, who account for 43 percent of the population. This is also typically the most productive and economically active population segment. Thirty percent of the population are between the ages of 0-19, while only three percent of persons in the study area are ages 65 or older.

**Table 2 Age and Gender profile for the study area (Statistics South Africa, 2001)**

Sub Place	0-19		19-39		40-64		65+	
	Male	Female	Male	Female	Male	Female	Male	Female
Mothotlung	2 149	2 241	2 018	2 006	1247	1290	148	215
Rankotia	108	104	66	74	75	72	8	28
Damonsville	334	344	327	315	182	138	16	24
Ga-Rankuwa	3	6	3	0	3	0	0	0
Brits NU	5 010	4 432	9 201	6 362	50 43	3 602	698	586
Magliesburg Nature Reserve	41	38	54	68	66	52	6	9
Pretoria NU	2 186	2 288	3 799	3 568	1 976	1 782	248	222



### **3.3.2 Education**

There is a compelling body of research that links primary and secondary education to economic development and growth. This research links education to earnings levels and to increased economic health of communities. Insight into the educational status of the population, and thus to be able to predict earnings levels and economic health are provided in the table below.

Education is an important indicator to analyse as it provides insight into the economic conditions of a community. The higher the level of education, the greater chance a population has to earn high incomes, since skill levels and this productivity levels are higher.

The figure below shows the number of persons over the age of 20 by the highest level of education reached. In the study area. There are thirty eight percent of the population who received either no schooling or some primary schooling. A further seven percent completed primary schooling and 29% received some secondary schooling. Only nineteen percent of the population completed grade 12 and six percent of the study area population have received higher education.

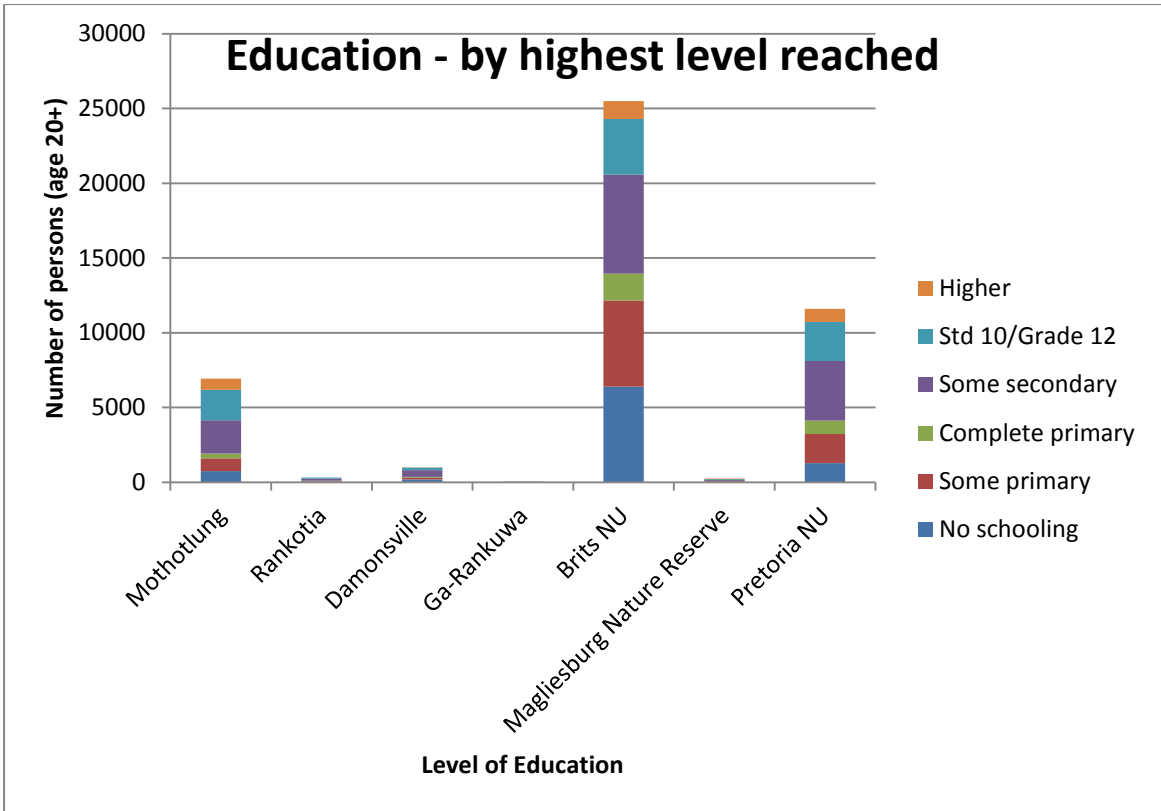


Figure 3 Number of persons by highest level of education reached.

Brits NU has the largest population who are have received some education. Of this population 6 606 persons have some secondary education while 6 394 persons have no schooling and 5 754 persons have some primary school.

Pretoria NU, the second largest population differs in that more from all other sub places in that the largest there are 3 964 persons who have some secondary schooling and 2 611 persons with grade 12. This is higher than the number of people with only primary education which is 1 961 persons and 1 265 persons who have received no schooling.

In summary, thirty eight percent of the study area population are probably completely, or functionally illiterate, with twenty six percent receiving an education sufficient to enable them to participate actively in the economy.

**3.3.3 Dwelling type**

Formal housing is classified as (Statistics South Africa, 2001):

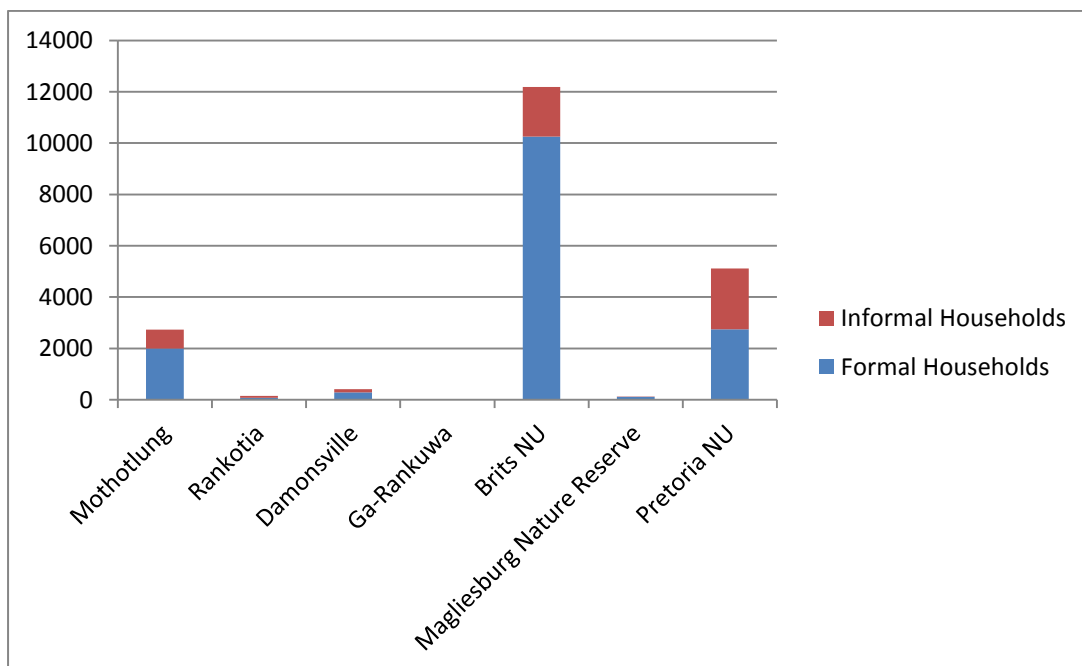
- ❖ House or brick structure on a separate stand or yard
- ❖ Flat in block of flats
- ❖ Town/cluster/semi-detached house (simplex; duplex; triplex)
- ❖ House/flat/room in back yard
- ❖ Traditional dwelling/hut/structure made of traditional materials
- ❖ Room/flatlet not in back yard but on shared property
- ❖ Caravan or tent
- ❖ Private ship/boat

Informal Housing is classified as (Statistics South Africa, 2001):

- ❖ Informal dwelling/shack in back yard
- ❖ Informal dwelling/shack not in back yard

The figure below taken from Census 2001 data reflects the number of households by formal or informal housing. There are 15 457 households in the study area who live in formal households. 5 235 households in the study area informal housing types.

Rantokia has the highest percentage of informal housing from all the sub places at forty eight percent while in Pretoria Nu forty six percent of household dwellings are informal. On the other hand, ninety one percent of houses in Magalies Nature Reserve are formal housing types.



**Figure 4** Number of households by Dwelling Type

## Electricity

Due to the nature of the project, electricity usage is determined in the study area using Census 2001 data. The data shows the household energy usage for lighting, heating and cooking.

The data shows that fifty two percent of the study area has electricity for lighting purposes while forty one percent are using candles for lighting.

For heating, forty four percent of households have electricity for heating, while twenty six percent use wood and twenty one percent use paraffin for heating.

The situation for cooking is similar with forty six percent of households having electricity for cooking while thirty seven percent of households use paraffin and fourteen percent use wood.

**Table 3: Number of households by energy usage (Statistics South Africa, 2001)**

Sub Place	Electricity	Gas	Paraffin	Wood	Coal	Animal dung	Candles	Solar	Other
<b>Lighting</b>									
Mothotlung	2 639	3	15	0	0	0	72	3	0
Rankotia	32	0	0	0	0	0	110	0	3
Damonsville	330	0	3	0	0	0	81	0	0
Ga-Rankuwa	0	0	3	0	0	0	0	0	0
Brits NU	5 431	47	945	0	0	0	5 629	24	111
Magliesburg Nature Reserve	89	0	3	0	0	0	17	3	0
Pretoria NU	2 262	20	221	0	0	0	2 581	21	13
<b>Heating</b>									
Mothotlung	2 463	8	129	18	83	3	0	3	22
Rankotia	23	0	54	50	16	0	0	0	0
Damonsville	330	7	49	25	0	0	0	0	0
Ga-Rankuwa	0	0	3	3	0	0	0	0	0
Brits NU	4 482	106	2 501	4 543	246	37	0	24	249
Magliesburg Nature Reserve	72	3	12	17	0	0	0	3	5
Pretoria NU	1 835	79	1 696	684	472	30	0	7	314
<b>Cooking</b>									
Mothotlung	2 487	14	201	8	7	0	0	8	4

Rankotia	23	3	77	35	8	0	0	0	0
Damonsville	332	9	64	3	5	0	0	0	0
Ga-Rankuwa	0	0	3	0	0	0	0	0	0
Brits NU	4 571	203	4 576	2 713	38	24	0	35	27
Magliesburg Nature Reserve	71	15	17	3	0	3	0	3	0
Pretoria NU	1 976	163	2 745	179	20	22	0	7	7

### 3.3.4 Economic Issues

The key economic activity of North West Province is mining. This economic activity generates more than half of the North West Province gross domestic product and provides jobs for more than a quarter of the workforce. The main minerals are gold, mined at Orkney and Klerksdorp; uranium, mined at Klerksdorp; platinum, mined at Rustenburg and Brits; and diamonds, mined at Lichtenburg, Christiana, and Bloemhof. The northern and western parts of the North West Province are characterised by sheep farming and cattle and game ranches. The eastern and southern parts of the North West Province, including the study area, are characterised by crop-growing regions producing maize, sunflowers, tobacco, cotton and citrus fruits.

The key economic activities of Gauteng Province are financial and business services, logistics and communications, and mining. Gauteng is the financial capital of Africa and is home to a high number of foreign and South African banks; stockbrokers and insurance corporations.

The table below describes the annual household income for the study area. Analysis of the study area reveals that the population is mostly low income earners at sixty nine percent. A third of all high income earning households are in the Brits NU area while which is followed by Pretoria NU.

Middle income earners are account for sixteen percent of the population while thirteen percent of households don't earn any income.

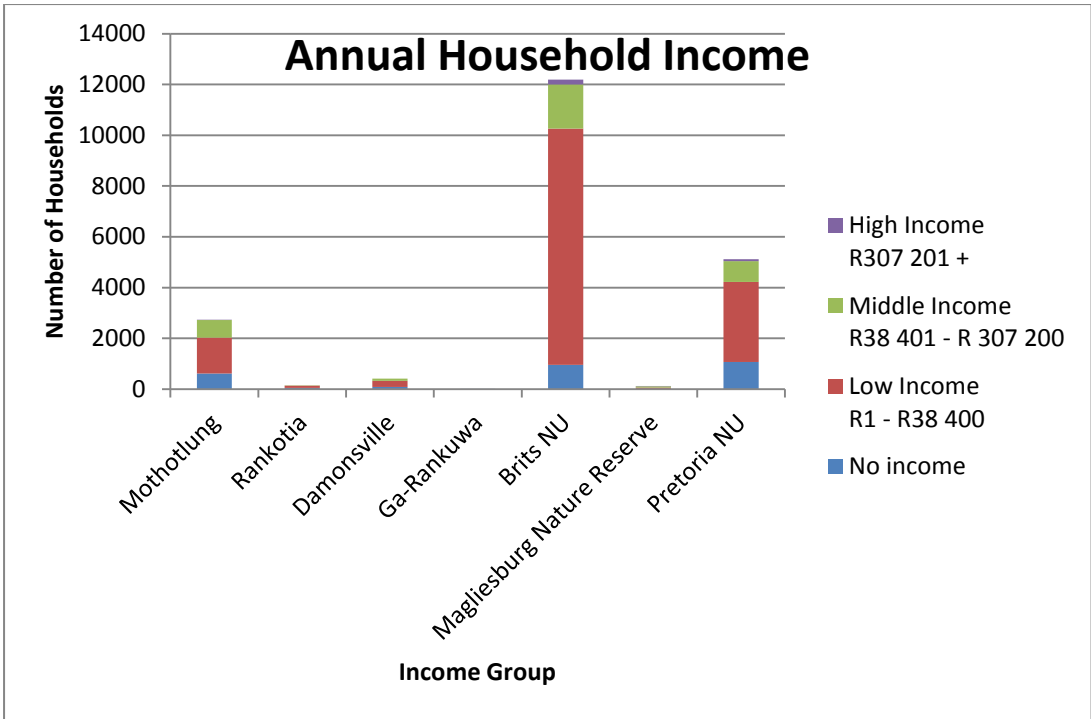
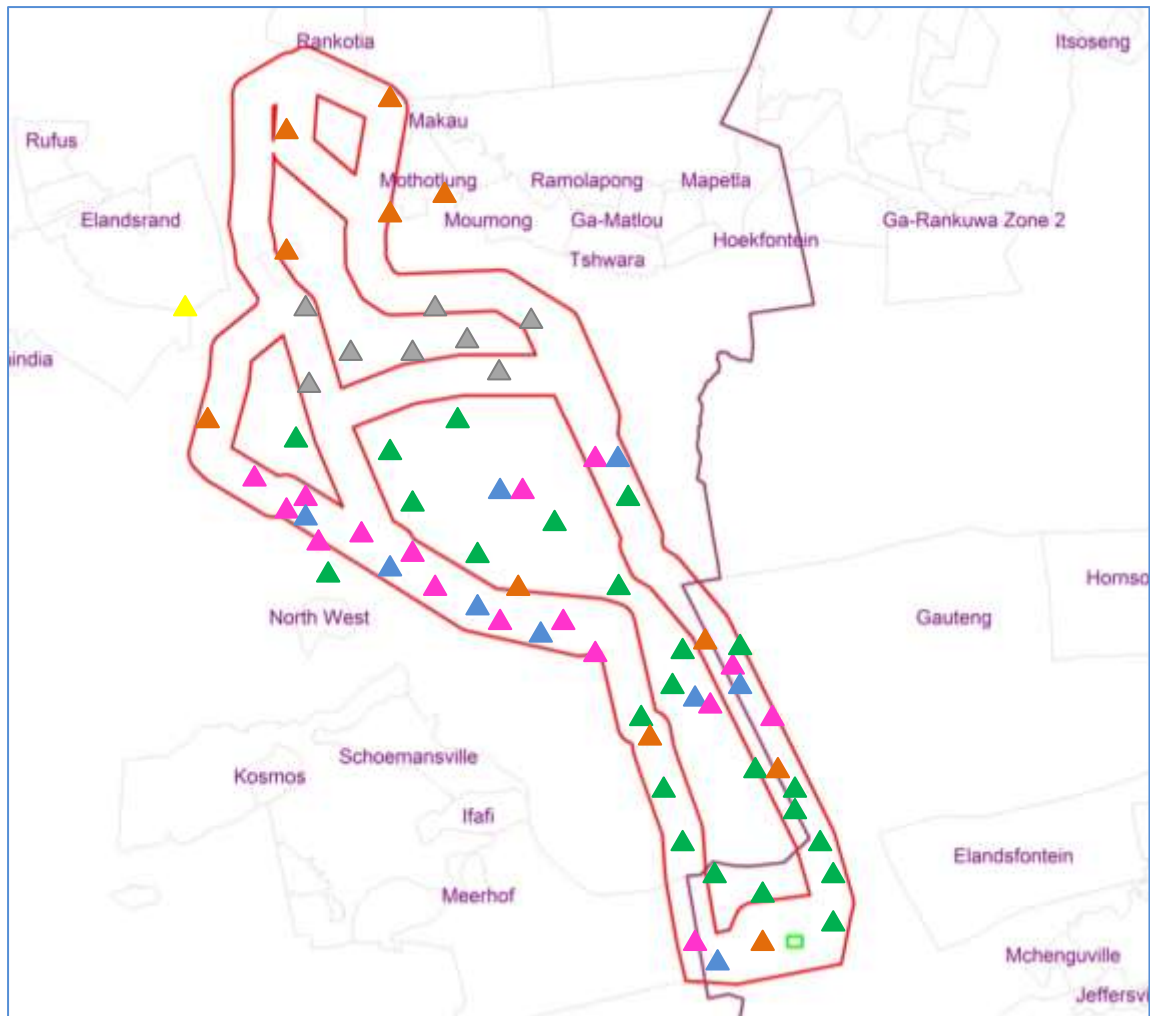


Figure 5 Income per household per annum (Statistics South Africa, 2001)

**3.4 Economics of the proposed routes**

The map below indicates the type of land use that occurs in each area of the project location. Please note that these are indicative locations of economic activity found in the study area. Markings are as follows:

- ❖ Commercial activity - Pink ▲
- ❖ Tourism - Blue ▲
- ❖ Agriculture - Green ▲
- ❖ Mining - Grey ▲
- ❖ Industrial - Yellow ▲
- ❖ Residential - Orange ▲



**Figure 6 Land use map**

From the map above it is evident that the land use for the area is for the most part dominated by agriculture. This is particularly evident in along the eastern route

Along the main roads there are commercial activity, thus the R511 Western Route South Alternative is mostly dominated by commercial activity.

### **3.5 Land use**

The land use in the areas is made up of the following:

- ❖ Agricultural;
- ❖ Mining;
- ❖ Commercial;
- ❖ Conservation and tourism;
- ❖ Industrial;

- ❖ Residential; and
- ❖ Vacant land.

Each of these land uses will be described in more detail to understand the nature of impacts and appropriate mitigation.

### **3.5.1 Agriculture**

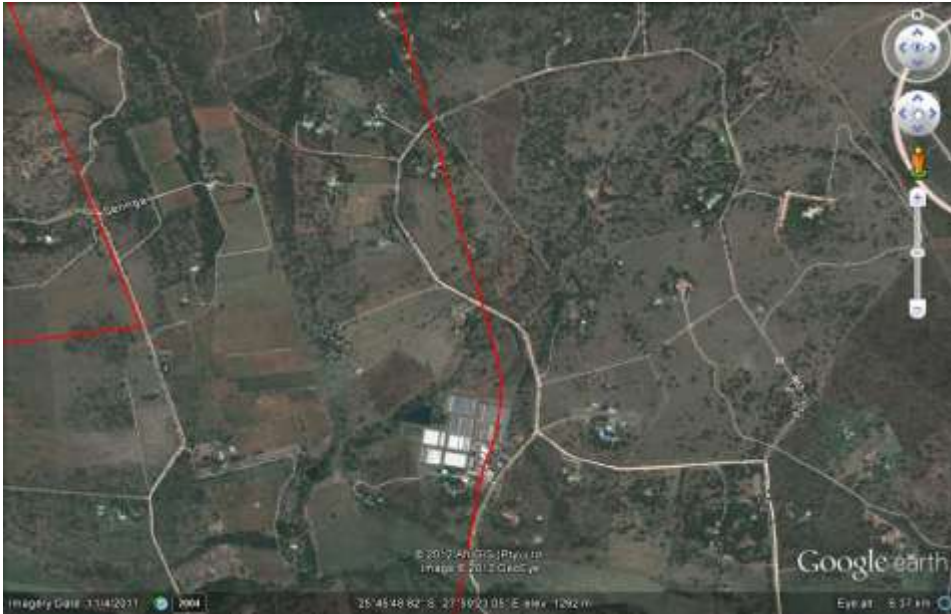
The second key economic activity of the North West Province is agriculture. The agricultural sector accounts for thirteen percent of the North West Province gross domestic product and provides jobs for approximately eighteen percent of the labour force. The main products that are produced in the region include sunflower seeds, groundnuts, maize, wheat and cattle. Due to higher rainfall the eastern part of the province also produces vegetables, flowers and poultry. Horticulture, aquaculture and bio-fuels are some of the new activities to be undertaken in the region with the North West already having several bio-fuels initiatives underway.

Agriculture in Gauteng is an important economic activity in the province and is focusing on providing cities and towns of the province with daily fresh produce. Bronkhorstspuit, Cullinan and Heidelberg are characterised by agricultural activities where ground-nuts, sunflowers, cotton and sorghum are produced.

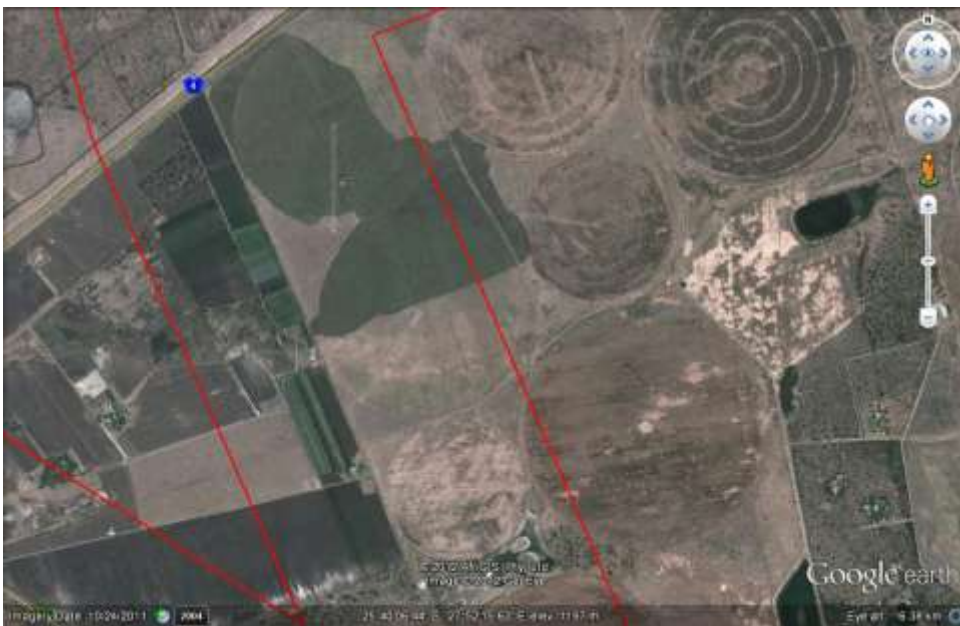
Food, food processing and beverages constitute an important part of the province's economy, with half of South Africa's agriprocessing companies operating in Gauteng. New and expanding products under development include organic food, essential oils, packaging, floriculture, medicinal plants, natural remedies and health foods.

The major land use in the study area is agriculture and mining. The agriculture in the study area is mainly citrus and maize farming. On both the eastern and western routes agriculture takes place.





**Figure 7: Google Earth Image of Agriculture along the Eastern Route**



**Figure 8: Google Earth Image of Agriculture along the Western Route**

### **3.5.2 Mining**

Mining is the main economic activity of North West Province. Mining produces more than fifty percent of the province's gross domestic product and provides employment for more than a quarter of the workforce. North West Province produces eighty four percent of South Africa's platinum, forty six percent of the granite and twenty five percent of the gold. It also produces

uranium, diamonds, fluorspar, copper, vanadium, limestone, slate, phosphate, coal, manganese, dimension stone, cement and nickel.

The North West Province is the fourth largest provincial contributor to the gross domestic product after Gauteng, KwaZulu-Natal and the Western Cape.

The Exxaro Eland Platinum Mine is a major land use component for the area. The mining area stretches across the eastern and western corridor, and falls within both the West Route and the East Alternative. The mine borders the R556, the R511 and the N4 roads.



Figure 9 Google Earth Image of Eland Platinum Mine covering the Eastern and Western Routes



**Figure 10 Eland Platinum Mine looking from the R556**

### **3.5.3 Commercial activity**

Land use for commercial activity, particularly along roadsides, is dominant. Commercial activity in this area includes petrol stations, small retail business and the sale of farm produce.



**Figure 11 Commercial activity on the Eastern Route**

### **3.5.4 Conservation and tourism**

The area is well marketed for tourism, which is particularly evident when driving along the main roads. Accommodation services occur throughout the southern portion of the study area. Small business targeting tourists are also particularly evident.

The Magaliesburg Natural Area and the Wonderboom Municipal Nature Reserve both fall within the study area. The Silkaatsnek Nature Reserve is found along the Western Route. It houses game, conferencing facilities and day visits.



Figure 12: Silkaatsnek Nature Reserve

### 3.5.5 Manufacturing and Industry

Except for mining, the province's economy is characterised by small, medium and micro enterprises (SMMEs). The North West Province aims at promoting diversification of activities to tourism and non-mining related manufacturing industries. The manufacturing sector is well developed within the big five municipalities; namely Brits, Rustenburg, Potchefstroom, Klerksdorp and Mafikeng. These municipalities account for more than fifty percent of the total manufacturing production in the North West Province.

The economy of Gauteng Province is moving away from traditional heavy industry markets towards high value-added production with particular focus on information technology, telecoms and other high-tech industries.

The Gauteng Province has the best telecommunications and technology infrastructure on the African continent including South Africa's five television stations. The province also incorporates the highest concentration of radio, internet and print media in Africa.

Manufacturing is an important economic activity within the Gauteng Province. It includes basic iron and steel, fabricated and metal products, food, machinery, electrical machinery, appliances, electrical supplies, vehicle parts and accessories and chemical products.

The figure below shows the number of people employed between the ages 15 and 65 in the study area. Agriculture is the biggest employer in the industry with over 10 000 persons, particularly in the Brits NU area, followed by Pretoria NU, being employed in agriculture. Manufacturing and Trade also employ a significant percentage, twenty one percent, of people in the study area.

In the one kilometre corridor there is no industrial land use. The Brits Industrial Township can be found outside the buffer region on the Western Boundary.

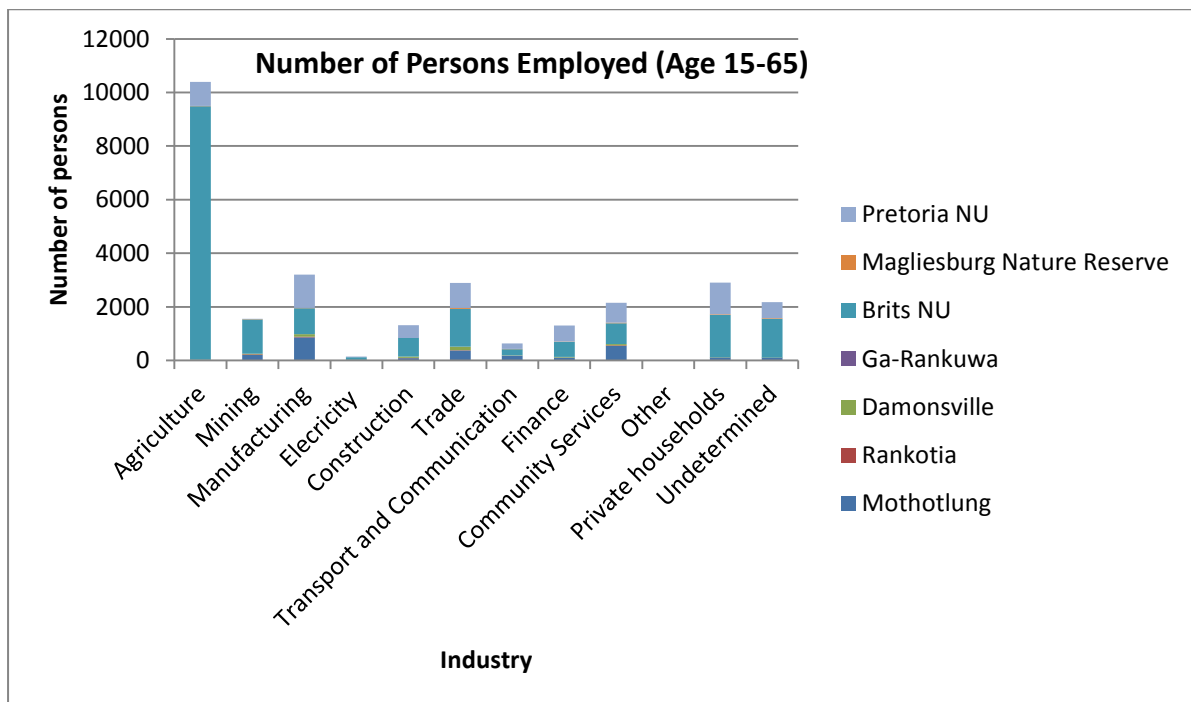


Figure 13 Number of persons employed per industry

### 3.5.6 Residential

Within the study area there are a number of residential areas. These include formal and informal settlements as well as scattered farm houses.

Areas with the greatest population density occur in the northern portion of the project area. On the Western Route West Alternative there is a large, dense informal settlement, lying along R511.



**Figure 14: Informal Settlement on the Western Route Western Alternative**

On the Western Route, above Eland Platinum Mine, Damonsville can be located. The area is quite formalised and densely populated. It lies within the western route corridor.



**Figure 15: Damonsville**

Less than three kilometres from Damonsville is the Mothutlung settlement. This area is made up of informal and formal housing. The Mothutlung area is expanding as new housing developments are being erected to cater for growing demand for housing.



**Figure 16: Google Earth image of the new housing developments in Mothulung**

The Mothulung housing developments lie directly in the study area and will be directly affected by the construction of the power line. The Figure below shows the new housing developments lie directly on in Eastern Route while the existing Mothutlung town falls just outside the 1km buffer region.





**Figure 17: Google Earth Image of Mothutlung and the new housing developments**

The Hartbeespoort low cost housing development occurs within the study area on the R514, along the western route corridor. The Google Earth image of the housing development can be seen in the Figure 18 below.

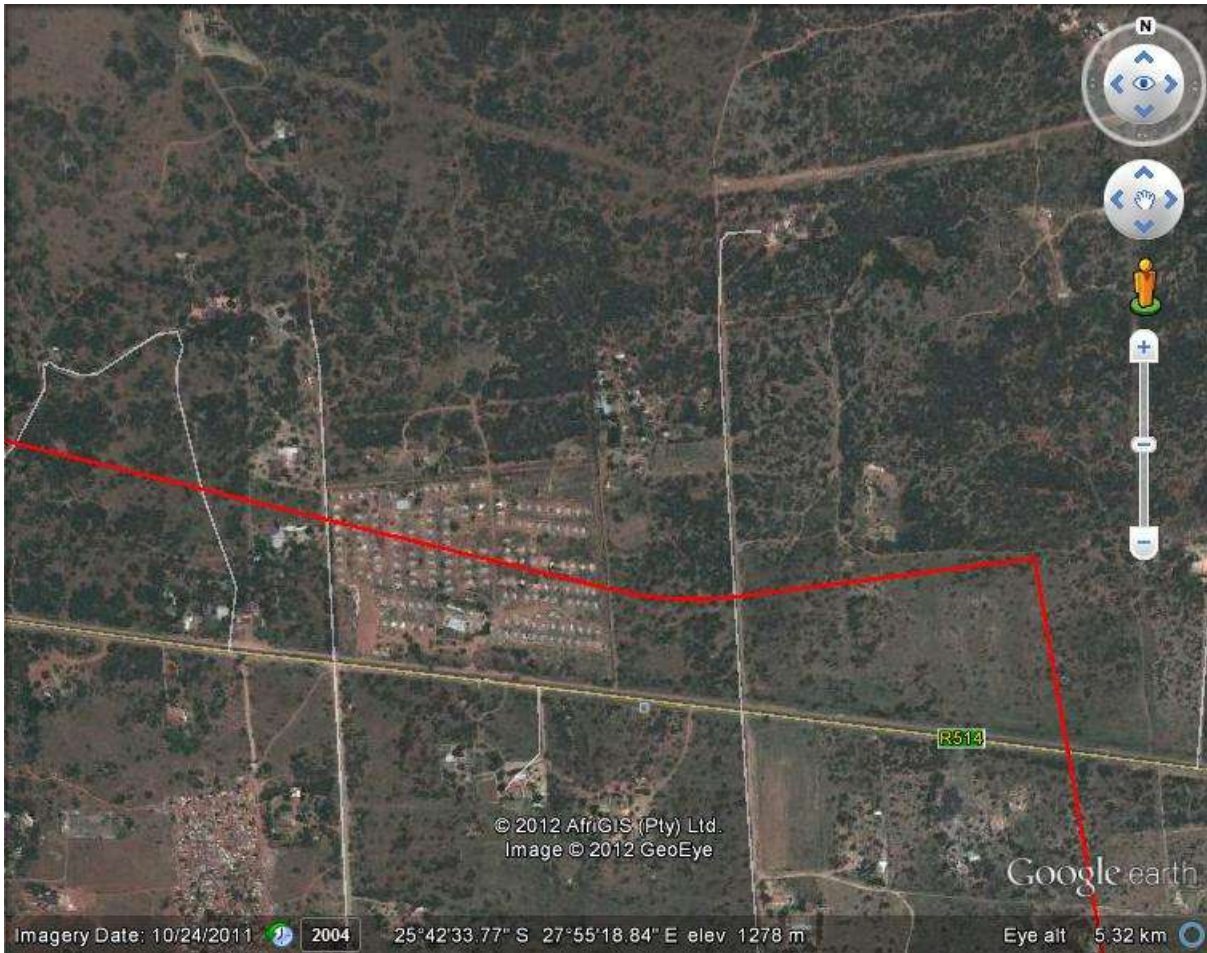


Figure 18 Google Earth image of new housing developments on the R514



Figure 19 Hartbeespoort Low Cost Housing Development

### 3.5.7 Vacant land

Vacant land, around the northern portion of the proposed project, is dominant. Land is not being used to the west of Mothulung and to the north of Damonsville. The immediate areas around the Eland Platinum Mine are vacant as well as the areas near the Dinaledi substation.

## 4 Social and Economic Impacts and Mitigation

### 4.1 Approach to the Estimation of Impacts

Most linear infrastructure projects will create socio-economic benefits and cause socio-economic harm, known as dis-benefits. A good project is where the benefits heavily outweigh the dis-benefits. The greater the gap between the two is, the better the project will benefit the intended beneficiaries.

The major benefit of the project under consideration is the construction costs of the infrastructure. Construction will create a clear stimulus to the regional economies.

The benefit during the operational phase for the project is a secure power supply to the region. The project will increase the capacity of the transmission network, which will in turn reduce the number of power failures in the region. The economic benefit to this security cannot be quantified with any accuracy, this impact however should not be underestimated when considering the positive impacts of the proposed project.

Similarly, the quantification of the costs of the project is not possible to carry out with any accuracy. The primary source of this inaccuracy is that the costs created by the project are on a very local scale, whereas the design information available at this stage of the project does not allow quantification on a local scale. The project corridors, being 1 000m wide and a total of some 60 kilometres long, do not allow the route to be determined with sufficient accuracy to quantify the cost of the installation on specific landowners. Neighbouring land portions and farms may display very different economic characteristics, which give rise to different economic costs created by the project. Thus the final placement of the towers is a crucial input to the estimation of the costs created by the project.

Hence the approach that has been taken in this study is to address the costs qualitatively. This approach allows the authors to highlight areas of economic impact and to suggest measures in which this impact can be reduced. This approach is appropriate given the stage of the project lifecycle, where permissions to proceed are sought, but prior to detailed design of the route, which include tower placement. Hence an opportunity exists for the economic study to influence the final design of the transmission line, by indicating areas of greatest economic cost, and how best to reduce this cost.

In order to increase the overall benefits of the project, the authors will also highlight areas where the project can increase its economic benefit. In this way the gap between the social and economic benefits and the dis-benefits is increased.

Where appropriate the study will highlight the benefits, or the costs, on a route-by-route basis. This will be done where the information at hand makes it possible, or where there are specific issues and concerns with a particular route. Otherwise this will be done generally, where applicable to all of the routes. Thus the analysis will proceed from the general to the specific. The general benefits and costs will be highlighted, and any specific issues with any of the routes will be addressed in a case-by-case basis in the sections below.

## ***4.2 Estimating the Social And Economic Impacts***

This section will describe the socio-economic impacts of the proposed powerline as well as the associated mitigation measures.

All impacts are analysed in the section to follow with regard to their nature, extent, magnitude, duration, probability and significance. The following definitions apply:

### **Nature (/Status)**

The project could have a positive, negative or neutral impact on the environment.

### **Extent**

Local – extend to the site and its immediate surroundings.

Regional – impact on the region but within the province.

National – impact on an interprovincial scale.

International – impact outside of South Africa.

### **Magnitude**

Degree to which impact may cause irreplaceable loss of resources.

- ❖ Low – natural and social functions and processes are not affected or minimally affected.
- ❖ Medium – affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- ❖ High – natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

### **Duration**

- ❖ Short term – 0-5 years.
- ❖ Medium term – 5-11 years.
- ❖ Long term – impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- ❖ Permanent – mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

### **Probability**

- ❖ Almost certain – the event is expected to occur in most circumstances.
- ❖ Likely – the event will probably occur in most circumstances.
- ❖ Moderate – the event should occur at some time.
- ❖ Unlikely – the event could occur at some time.

❖ Rare/Remote – the event may occur only in exceptional circumstances.

**Significance**

Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-

- 0 – Impact will not affect the environment. No mitigation necessary.
- 1 – No impact after mitigation.
- 2 – Residual impact after mitigation.
- 3 – Impact cannot be mitigated.

### ***4.3 Economic Impacts***

There is likely to be a short term increase in economic activity as a result of the substation. The construction labour force will not only be earning an income in the area, but consumption will take place this increase the commercial activity and the flow of money in the area.

This may result in short term indirect economic gains, which will be in the form of purchasing construction material and transport.

Through the employment of local labour, skills and knowledge transfer is likely to take place which can increase the employability of these workers. Employment will also increase the income of households and capacity to be more productive.

The strength of the existing power lines will increase given the proposed power lines. Given that Pretoria is expecting to double its electricity demand in the next 20 – 30 years, the project is will secure stable supply of electricity to this region. The economic and social benefits is having a more secure electricity supply are clear and are felt in areas as diverse as education, health, public infrastructure such as street lighting, heating and cooling and uses in the productive economy.

<b>Economic Feature</b>		<b>General Economy</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern and Western Route</b>				
<b>Project life-cycle</b>		<b>Pre- Construction and Construction phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
❖ Positive impact on the local economy.		❖ No mitigation required				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	+	Local	Low	Short	Almost Certain	3
<b>After Mitigation</b>	+	Local	Low	Short	Almost Certain	3

<b>Economic Feature</b>		<b>General Economy</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern and Western Route</b>				
<b>Project life-cycle</b>		<b>Operational Phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
❖ Positive impact of stable electricity supply		❖ No mitigation required				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	+	Local	Low	Long	Almost Certain	3
<b>After Mitigation</b>	+	Local	Low	Long	Almost Certain	3

#### **4.4 Visual, Tourism and Leisure Impacts**

The tourism and leisure attractions in the Hartbeespoort area are well established. The mountains and dam provides opportunity for tourism. A large proportion of the study area is used for conservation, nature reserves, and accommodation and tourism facilities. Thus there is a visual appeal to the land which has been used to generate income.

The impact of having a transmission line in such an environment could result in loss of income. The visual appeal of the land will be negatively impacted by having a transmission line. Specifically, in the study area, the Silkaatsnek Nature Reserve, the Magaliesburg Natural Environment area and a portion of the Wonderboom Municipal Nature Reserve may be impacted.

Nature Reserves, when associated with tourism and leisure, derives their economic value from offering a glimpse of the natural wonders of the area, with a focus upon viewing game and the ecological habitat. This value proposition generally targets upper income earners, who place value on a rural sense of place and being in an environment that is as close to natural as possible. When this is not being offered, the value proposition decreases and the affected nature reserves would have to adjust its offering to the market to remain competitive.

Transmission lines impact upon the value proposition by bringing modern development to this natural environment, thereby reducing the rural and undeveloped sense of place.

The construction phase can impact negatively through loss of income or reputation as the natural environment is disturbed. Impacts associated with construction crew actions, resulting in the loss of stock or equipment should also be considered. Hence the final routing, construction and maintenance of the transmission lines should be carried out to have as little impact as possible on the tourism and leisure industries.

<b>Economic Feature</b>		<b>Visual , Tourism And Leisure Impacts</b>
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern and Western Route</b>
<b>Project life-cycle</b>		<b>Pre- Construction and Construction phase</b>
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>	
<ul style="list-style-type: none"> <li>❖ Route selection that disrupts the visual appearance of tourism and leisure facilities can have a negative impact and result in loss of income.</li> <li>❖ Pylons placement that disrupts access to facilities.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Route selection that avoids nature reserves is the most ideal outcome. Thus should Western Route South Alternative take place, it is advised that pylons be placed on the opposite end of the road to the Silkaatsnek Nature Reserve.</li> <li>❖ Where possible, routing should be selected to traverse low visual impact areas of any farm and areas that have low tourism values. This would mean that main roads such as the R511 are avoided. Care should be taken during route selection not to interrupt access and internal roads within tourism and leisure facilities;</li> <li>❖ The use of visually appealing pylons, or pylons that reduce the number of structures per kilometres should be used where appropriate.</li> </ul>	



<ul style="list-style-type: none"> <li>❖ Disruption of tourism and leisure facilities due to construction activities which could later the nature of tourism activity.</li> <li>❖ Poor housekeeping by construction staff.</li> <li>❖ Stock losses due to poor construction housekeeping.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Agreement should be reached with each landowner on the construction programme and impacts on the property during construction. Where necessary construction could be scheduled during low tourist season on affected farms. Agreements made prior to construction with respect to property access, the duration of construction and the impacts on the land should be adhered to by both the landowner and the utility.</li> <li>❖ All local mitigation measures agreed to for each operation should adhered to by Eskom site staff.</li> <li>❖ Eskom compensates affected landowners at a market-related rate for stock and equipment losses which are directly attributable to construction activities.</li> </ul>
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	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Medium	Medium	Likely	2
<b>After Mitigation</b>	-	Local	Low	Medium	Moderate	1

<b>Economic Feature</b>	<b>Visual , Tourism And Leisure Impacts</b>					
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern and Western Route</b>					
<b>Project life-cycle</b>	<b>Operational Phase</b>					
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>					
<ul style="list-style-type: none"> <li>❖ Disruption of tourism and leisure facilities due to operations and maintenance activities.</li> <li>❖ Poor housekeeping by operations and maintenance staff.</li> <li>❖ Stock losses due to poor operations and maintenance staff housekeeping.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Operations and maintenance access should be arranged and discussed with the landowner prior to the operation being carried out.</li> <li>❖ All local mitigation measures agreed to for each operation should adhered to by Eskom site staff.</li> <li>❖ Eskom compensates affected landowners at a market-related rate for stock losses, directly attributable to operation and maintenance activities.</li> </ul>					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Low	Short	Moderate	1
<b>After Mitigation</b>	-	Local	Low	Short	Moderate	0

## **4.5 Land Value and Servitude**

A servitude of fifty five meters or 27.5m on either side of the centre of the power line will need to be purchased. The purpose of the servitude is to ensure public safety, safe construction, maintenance and operation of the line.

Eskom will be entitled to unrestricted access. Negotiation with land owners on access control measures and security issues with regards to locking and unlocking of gates on private properties and damage to fences and gates will need to take place.

The land beneath the overhead lines and within the 55m wide servitude may continue to be used for some activities by the landowners, however, no crops or trees higher than 4m will be allowed along the route, and no structures may be developed underneath the line or within the servitude area.

The proposed power line can negatively impact the development and infrastructure plans for the area. Development within the 55m wide servitude will be restricted. Certain farming and current land use may need to be stopped completely or altered resulting in potential loss of income.

Provisions in South African law allow the establishment of a servitude for the use of the utility, whilst still preserving the ownership of the land with the landowner. The utility thus has rights over the land that exceeds those claimed by the landowner. This trade-off is generally negotiated between the utility and the landowner and involves the payment to the landowner of a sum of money in compensation for the land rights. In the event that agreement cannot be reached, the state does have the right to expropriate the land. This power exists to ensure that landowners who are in the path of proposed public utilities do not have the power to hold the project to unreasonable ransom and to ensure that the public good trumps individual rights.

Thus the emphasis should be on the value of compensation that is to be paid to the landowner for servitude rights. This value depends on the area of servitude, the land use of the servitude area, the impact on productivity and the alterations to land use that will be required.

Comparable sales are traditionally the method used for servitude valuations, where such values exist. This method will best take into account intangible factors such as the visual impacts of transmission lines.

Research suggests that where there are electricity transmission lines, the land value in close proximity to those transmission lines fall. In the study by Elliot and Wadley (2002) a list of various research papers were provided with the estimated value of the fall in property prices. It was found that the percentage decrease in property values ranges from 1 percent to 27 percent. The degree of depreciation depends upon the value, size and location of the property in question.

Larger properties were less affected than small properties, this applies particularly to farmland. It was also found that the higher the value of the land, the larger the impact on land value.

The literature also suggests that the impact on property prices diminishes over time. The impact of transmission lines on property values is initially high. Over time the visual impact decreases as trees and other developments surround the area. Thus the long term impact on property prices will likely be low.

The literature thus suggests that land values do decrease when servitudes are registered over them, and for this the landowner should be compensated. The legal and operational framework for compensation is well established and the channels for negotiation are open for landowners to follow. In this regard an excellent summary of the complexity of the compensation issue has been prepared by Rode and Associates C.C. in October 2007. The study is entitled "Gamma-Grassridge: Compensation Specialist Study" and was conducted for a proposed Eskom transmission line in the Eastern Cape Province.

It is suggested that the guidelines developed for the purposes of this study are used in the payment of compensation during the registering of servitudes over land affected by the routes.

With regards to land values and compensation for the use of a servitude, impacts and mitigation should take into account the following categories of concern:

- ❖ the visual impacts on lines;
- ❖ maintenance issues during operation;
- ❖ multiple lines on a single property;
- ❖ larger relative impacts on small properties than on large farms;
- ❖ the public relations aspects of Eskom's business; and
- ❖ loss of business caused by the servitude.

<b>Economic Feature</b>		<b>Impact on Land Values</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Main Route; Alternative 2; Alternative 3; Alternative 4</b>				
<b>Project life-cycle</b>		<b>Pre- Construction and Construction phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>❖ The negative financial impact of having a servitude, or further servitude, registered over a property.</li> <li>❖ Access to the land may result in farmland and other property being vulnerable to theft and other security risks.</li> </ul>		<ul style="list-style-type: none"> <li>❖ Compensation should be paid by the utility for the right of use over the servitude. This value should be set via negotiation with affected landowners and take into account current norms and practice with regards compensation. The use of the power to expropriate land should not be excluded from consideration, given the wider public good that the transmission lines serve.</li> <li>❖ Mitigation could also take the form of off-sets resulting from the project. Examples include improving access to a series of properties to offset the economic impacts of the transmission line or through improving internal roads as part of access to the pylons.</li> <li>❖ Where there are existing power lines, the width of the servitude should be widened and the land should be used for the new transmission lines. This will minimise the negative impacts on the land and reduce the use of income generating land.</li> <li>❖ Land that has a lower economic value should be purchased for use of the power lines. This will minimise the impact on high value land and minimise the fall in property values.</li> </ul>				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	-	Local	Medium	Medium	Likely	2
<b>After Mitigation</b>	-	Local	Low	Short	Moderate	1

<b>Economic Feature</b>		<b>Impact on Land Values</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Main Route; Alternative 2; Alternative 3; Alternative 4</b>				
<b>Project life-cycle</b>		<b>Operational Phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
<ul style="list-style-type: none"> <li>❖ Access to the land may result in farmland and other property being vulnerable to theft and other security risks.</li> </ul>		<ul style="list-style-type: none"> <li>❖ Negotiation with farmers around access to land and safety is encouraged. Fencing of properties and the maintenance thereof should also be negotiated. Compensation for loss of stock where negligence on Eskom's behalf can be proved, should take place.</li> </ul>				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	-	Local	Medium	Long	Likely	2
<b>After Mitigation</b>	-	Local	Low	Long	Moderate	1

## 4.6 Loss of Production

The project area is generally rural in nature, with urban and commercial activity increasingly occurring. Land used for agriculture is the most common on the project study area with citrus and maize being farmed.

Current farming practices may be disturbed due to the development of the transmission lines. This will be through loss of land available for produce as well as a capital cost on the value of the land. There will be an expected decline in output as agricultural activity in the servitude area will be limited. Thus there is likely to be a loss of potential and existing income.

The biggest loss of productive land is expected to occur during the construction phase of this development. There may be an expected removal of all crops within the servitude land for construction and road purposes.

Furthermore there is an impact on the way in which agriculture can take place. Transmission lines place a restriction on the types of agriculture that can occur on the land. Thus there is a loss of production capacity.

Agriculture accounts for 36 percent of employment in the area which means that land use has a significant economic impact on production and income generation. Thus the impact on the loss of agricultural land and limitation on agricultural activity is likely to be very significant.

The importance of agriculture for the communities cannot be overstated. In general, these communities are poor, located in geographic areas where the economic is not diversified away from agriculture and are generally able to offer only manual labour to the market. Thus these communities are economically vulnerable and disruption to agricultural production will have disproportionately large impacts on those affected.

<b>Economic Feature</b>	<b>Loss of Production</b>
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern Route and Western Route</b>
<b>Project life-cycle</b>	<b>Pre-Construction and Construction phase</b>
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>

❖ Route selection which disrupts agricultural production, impacts on irrigation is the most difficult to mitigate.	<ul style="list-style-type: none"> <li>❖ Route selection that avoids irrigated agriculture</li> <li>❖ The use of high pylons to minimize disruption;</li> <li>❖ Care should be taken during route selection not to interrupt access and internal roads within agricultural production units;</li> <li>❖ The use of free-standing pylons where necessary to enable farming to proceed without encumbrance from guying. Due regard should be had when implementation</li> <li>❖ If more than one line crosses agricultural land, then route selection should, as far as possible, use the existing transmission line servitude in the crossing. Using a totally new routing should be avoided where possible this measure to the higher costs of the free-standing pylons.</li> <li>❖ Purchasing of produce should be negotiated with farmers. If farmer choose to harvest the land before construction that there will be no need for compensation. However, should the land remain un-harvested, there will be need to compensate farmers for produce that is left on the land.</li> </ul>
❖ The cumulative impact of this project's lines adding to the existing lines on agricultural land will be higher as the number of lines increases.	❖ If more than one line crosses agricultural land, then route selection should as far as possible, use the existing transmission line servitude in the crossing. Using a totally new routing should be avoided where possible.

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Medium	Medium	Likely	3
<b>After Mitigation</b>	-	Local	Low	Medium	Moderate	2

<b>Economic Feature</b>	<b>Loss of Production</b>					
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern Route and Western Route</b>					
<b>Project life-cycle</b>	<b>Operational Phase</b>					
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>					
❖ Route selection which disrupts agricultural production, impacts on irrigation is the most difficult to mitigate.	<ul style="list-style-type: none"> <li>❖ Where possible, irrigation farming infrastructure should be avoided;</li> <li>❖ If it cannot be avoided, compensation to reinstate the infrastructure should be paid;</li> <li>❖ Where possible, the lines should be located so as to minimise the impact on production during the operation phase</li> </ul>					
	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Medium	Long	Likely	2
<b>After Mitigation</b>	-	Local	Low	Long	Moderate	1

## **4.7 Impacts on the social environment**

The study area has a high population growth rate and is developing rapidly. With the proposed project which is likely to attract workers, this population growth rate may increase and cause further strain on development needs.

When workers come into an area, there is a need to supply municipal services to these workers. The municipality may or may not have the capacity to support a larger number of people. Thus causing strain on social services.

As is common with migrant workers in an area, there may be some social disruption. The relations between locals and new job seekers may not be smooth and lead to conflict in the community.

Workers entering the area will also be competing with locals for employment which may cause tension in the community. Locals and new job seekers will be competing for the same jobs. Thus it is important to deter job seekers and stress on local employment.

Relations between migrant workers and locals can potential cause health problems by rising HIV and AIDS or other sexually transmitted diseases. This is a typically the case when a large number of males enter into an area. Hostel like structures will need to be prevented and awareness campaigns should be conducted.

During construction, the safety and security of labourers around may be at risk when working with transmission lines. Thus effective mitigation measures will need to be in place to avoid loss of life or injury. There safety of farming livestock will also need to be ensured

<b>Economic Feature</b>	<b>Impacts on the social environment</b>
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern Route and Western Route</b>
<b>Project life-cycle</b>	<b>Pre-Construction and Construction phase</b>
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>

<ul style="list-style-type: none"> <li>❖ Social conflict can be disrupted as a result of the potential job seekers entering the area.</li> <li>❖ The spread of disease due to hostel like living and relations between locals and job seekers take place. HIV/ AIDS and other STDs may spread as a result.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Any mitigation to avoid new job seekers from entering the area should be avoided. These can be done through the encouragement of local labour and importing of only necessary skilled labour</li> <li>❖ Education campaigns on and awareness to on sexually transmitted diseases should take place to avoid health related issues.</li> <li>❖ Should there be significant imported labour, care should be taken to integrated workers into the local community to avoid any conflict and disturbance to the social structure of the surrounding communities.</li> </ul>
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	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Medium	Medium	Likely	3
<b>After Mitigation</b>	-	Local	Low	Medium	Moderate	2

<b>Economic Feature</b>	<b>Impacts on the social environment</b>
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern Route and Western Route</b>
<b>Project life-cycle</b>	<b>Operational Phase</b>
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>
<ul style="list-style-type: none"> <li>❖ Social conflict can be disrupted as a result of the potential job seekers entering the area.</li> <li>❖ The spread of disease due to hostel like living and relations between locals and job seekers take place. HIV/ AIDS and other STDs may spread as a result.</li> </ul>	<ul style="list-style-type: none"> <li>❖ Any mitigation to avoid new job seekers from entering the area should be avoided. These can be done through the encouragement of local labour and importing of only necessary skilled labour</li> <li>❖ Education campaigns on and awareness to on sexually transmitted diseases should take place to avoid health related issues.</li> <li>❖ Should there be significant imported labour, care should be taken to integrated workers into the local community to avoid any conflict and disturbance to the social structure of the surrounding communities.</li> </ul>
<ul style="list-style-type: none"> <li>❖ Safety and security of the workers and the community may be at risk during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>❖ In order to mitigate against theft on farmland during construction, there should be effective consultation and fencing where possible to ensure controlled access to farming land to prevent theft and opportunistic behaviour.</li> </ul>

	+/- Impacts	Extent	Magnitude	Duration	Probability	Significance
<b>Before Mitigation</b>	-	Local	Medium	Long	Likely	2
<b>After Mitigation</b>	-	Local	Low	Long	Moderate	1



## **4.8 Employment and skills transfer**

There is likely to be a positive impact on employment especially during the construction phase. Construction of the power lines will require labour for building the power lines while the operation phase will require labour for maintenance.

Employment can become a sensitive issue, particularly the concern over local labour. There may conflict is migrant workers are given preference to employment opportunities. However the nature of transmission lines requires skilled labour.

Potential secondary employment impacts can result as small business employs more persons to sell goods to labourers.

The project has the potential to positively impact upon household incomes during the construction phase. In the study area, most people are low income earners thus employment of locals will create a positive impact on local communities who can derive some economic benefit from the project.

At least, the contractor should be barred from bringing unskilled labour in from areas outside the immediate area of construction. The contractor should also be encouraged to employ a proportion of their semi-skilled labour requirements from the ranks of the local communities. In addition, the contractor could be obliged to employ labourers on short term contracts of three months, similar to the government sanctioned Expanded Public Works Programme contracts. This would ensure that the project components create as many work opportunities in the affected areas as possible.

The project also has the potential to positively impact upon the skills levels in local communities during the construction phase. Only 19 percent of persons over the age of 20 matriculated. Thus the skill level of the community is not very high. Any local training and skills transfer that results from the project will create a positive impact.

Thus, the impact on skills acquisition would be largest if the transmission line followed the Main Route or Alternative Two, rather than Alternative Three. This conclusion is valid if the contractor implements skills-based training programmers at the site. Unskilled workers could be taught a skill and achieve a certificate to support the skill. This would provide a degree of assistance with the worker's future search for work and allow the project to leave a lasting legacy on the economic wellbeing of the affected community.

Thus if all other aspects are ambivalent about which routing to follow, the employment and skills transfer aspect would dictate which of the routes would most benefit the affected communities. This conclusion is modified by the proviso that the employment and skills impacts are relatively small and short-term in nature and that the populations of all routes would benefit from the employment and skills transfer potential offered by the proposed project.

<b>Economic Feature</b>		<b>Employment and Skills Transfer</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern Route and Western Route</b>				
<b>Project life-cycle</b>		<b>Pre-Construction and Construction phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
❖ Route selection that runs through or near areas of poverty will greatly enhance opportunities for the use of local labour during construction.		<ul style="list-style-type: none"> <li>❖ Route selection to benefit more poverty affected areas, whilst taking into account the larger benefit of choosing the most cost efficient line will outweigh any local poverty alleviation benefits.</li> <li>❖ Compelling the contractor to use 100% local labour in the unskilled category of employment.</li> <li>❖ Compelling the contractor to use as much as possible local labour in the semi-skilled category of employment.</li> <li>❖ The use of three month long employment contracts to ensure that the maximum numbers of work opportunities are created in the area.</li> </ul>				
❖ Route selection that runs through or near areas of poverty will greatly enhance opportunities for a formal skills training programme to be implemented for the local labour force.		<ul style="list-style-type: none"> <li>❖ Route selection to benefit areas with a higher education deficit, whilst taking into account the larger benefit of choosing the most cost efficient line will outweigh any skills training benefits.</li> <li>❖ Compelling the contractor to implement a skills training programme for the local labour force.</li> </ul>				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	+	Local	Low	Short	Unlikely	0
<b>After Mitigation</b>	+	Local	Low	Short	Likely	1

<b>Economic Feature</b>		<b>Employment and Skills Transfer</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern Route and Western Route</b>				
<b>Project life-cycle</b>		<b>Operational Phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				

❖ No operational phase impacts are foreseen	❖					
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	-	-	-	-	-	-
<b>After Mitigation</b>	-	-	-	-	-	-

## 4.9 Roads and Traffic

### Impact

During the construction phase there may be traffic disruptions in the area. Heavy construction vehicles may cause damage to the roads.

There may be temporary and permanent roads that will need to be built in order to ensure proper maintenance of the power lines.

Traffic will be temporary and mitigation can be done well in advance by awareness of the project. .

<b>Economic Feature</b>	<b>Roads and Traffic</b>					
<b>Relevant Alternatives &amp; Activities</b>	<b>Eastern Route and Western Route</b>					
<b>Project life-cycle</b>	<b>Pre-Construction and Construction phase</b>					
<b>Potential Impact</b>	<b>Proposed Management Objectives / Mitigation Measures</b>					
<ul style="list-style-type: none"> <li>❖ Temporary disruptions to traffic during the construction phase may occur.</li> <li>❖ New road may be build – both temporary and long term which may impact land use and accessibility during the construction.</li> </ul>	<ul style="list-style-type: none"> <li>❖ In terms of using road, there should be no reliance on farmers and other landowners for usage of their roads. If there is a need for permanent roads, than land should be bought from the land owners and permanent roads should be built. This road can be built within the servitude.</li> <li>❖ Access to the roads should be limited to Eskom and farmer and other land owners. There will need to be negotiations with farm owners regarding access. This restriction on road usages is to ensure security for farmers.</li> <li>❖ Rehabilitation where temporary roads were constructed will need to be ensured</li> </ul>					
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	-	Local	Low	Short	Likely	2
<b>After Mitigation</b>	-	Local	Low	Short	Likely	1

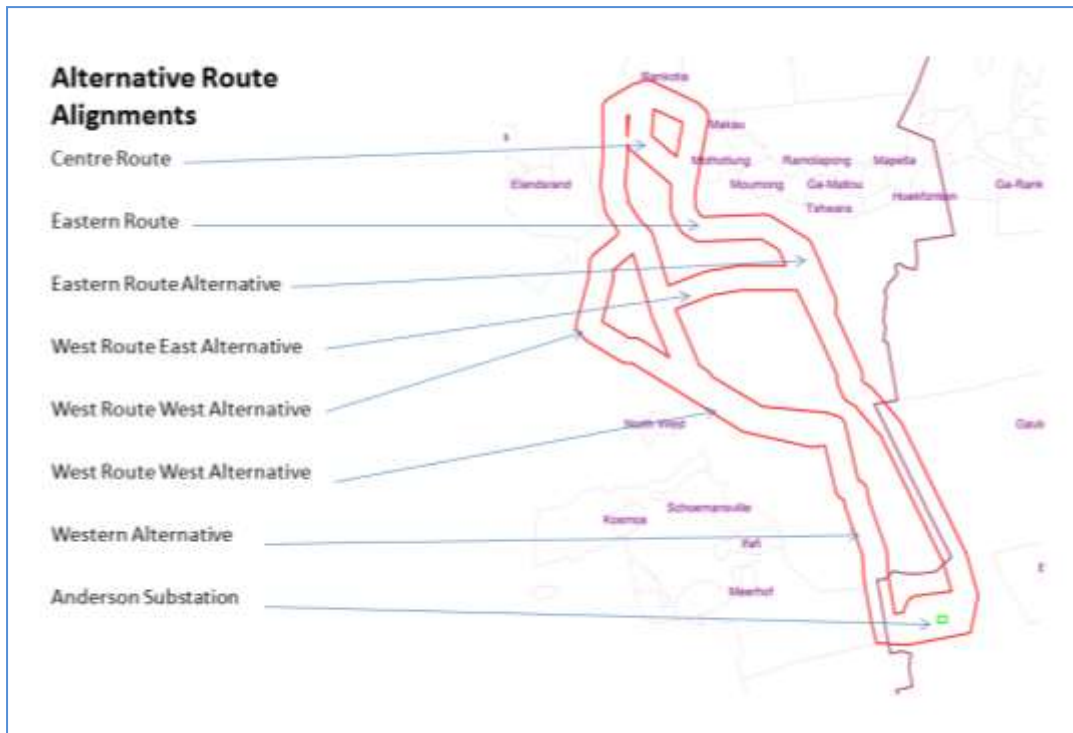
<b>Economic Feature</b>		<b>Roads and Traffic</b>				
<b>Relevant Alternatives &amp; Activities</b>		<b>Eastern Route and Western Route</b>				
<b>Project life-cycle</b>		<b>Operational Phase</b>				
<b>Potential Impact</b>		<b>Proposed Management Objectives / Mitigation Measures</b>				
❖ Access to permanent roads should be restricted to Eskom and farm owners only to ensure security.		❖ Access to the roads should be limited to Eskom and farmer owners. There will need to be negotiations with farm owners regarding access. This restriction on road usages is to ensure security for farmers.				
	<b>+/- Impacts</b>	<b>Extent</b>	<b>Magnitude</b>	<b>Duration</b>	<b>Probability</b>	<b>Significance</b>
<b>Before Mitigation</b>	-	-	-	-	-	-
<b>After Mitigation</b>	-	-	-	-	-	-

## 5 Comparative Analysis Of The Route Alternatives

There are two route alternatives that could be used to achieve the aims of the project. These alternatives are presented in the figure below.

In addition to these route alternatives, there is the No-Go Alternative. This is the option not to construct the transmission line.

The economic impact of the project will be to secure adequate and reliable electricity supplies to the region. This will directly affect households and business in the area, allowing them to continue and to develop economic opportunities. In a modern economy, such as that in the study area, the positive economic impacts of this are manifest. Thus the No-Go Alternative is not a realistic option.



**Figure 20 Alternative Route Alignments**

The preferred choice between the alternatives will be the alternative that has the lowest social and economic impacts. Owing to the largely qualitative nature of the study, the determination of the route with the lowest economic impact will thus contain a degree of subjectivity. A more precise determination could be carried out if the costs for the project, including that for the acquisition of servitudes, and the exact route, were obtained and were available.

The determination will be carried out with reference to the following impacts:

- Economic benefits of improved electricity supply at the lowest cost
- Visual, Tourism and Leisure Impacts
- Land Value and Servitude Impacts;
- Loss of Production;
- Impacts on the Social Environment;
- Employment and skills transfer during the construction phase; and
- Roads and Traffic Impacts.

These impacts were identified earlier in the study and do not include the positive impact of increased and more reliable electricity supply to the region. This impact is common, and equal, for all routes and can therefore be removed from consideration.

The economic requirement of lowest cost for the same quality of product is included in the evaluation criteria. The impact of damage to property has been excluded from the evaluation criteria owing to it being common to all routes. Although the costs to repair damage may be higher on higher value land, this is not certain, and may indeed be equal to the costs on lower value land.

<b>Dinaledi Anderson Transmission Line Route Alternatives</b>
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		Advantages	Disadvantages	Priority* (1/2/3)
	<b>Eastern Route</b>	<ul style="list-style-type: none"> <li>✓ Lowest Cost Alternative</li> <li>✓ Less economic activity than the western route;</li> <li>✓ Less tourism and visual impacts;</li> <li>✓ Impacts on agricultural production able to be mitigated.</li> </ul>	<ul style="list-style-type: none"> <li>× Passes through productive agricultural land;</li> <li>× Higher potential loss of income due to agricultural activities;</li> <li>× Traverse through the Eland Mine should be negotiated with mine owners, this traverse is easier when using the Eastern Route</li> </ul>	2
	<b>Eastern Route Alt A – Western Diversion away from Mothutlung</b>	<ul style="list-style-type: none"> <li>✓ Moves away from potential development near Mothutlung;</li> </ul>	<ul style="list-style-type: none"> <li>× Same as eastern route alternative;</li> </ul>	1
	<b>Western Route</b>	<ul style="list-style-type: none"> <li>✓ Easily accessible along the R511;</li> <li>✓ Avoids large scale agriculturally productive land;</li> </ul>	<ul style="list-style-type: none"> <li>× Highest Cost Alternative</li> <li>× Passes through a more broadly based economy;</li> <li>× Will have a higher impact on residential development;</li> <li>× Difficult to pass through the Eland Mine;</li> <li>× This route has the highest potential impact on tourism and leisure activities.</li> </ul>	3
	<b>Western Route Alt A – Eastern Diversion through Eland Mine</b>	<ul style="list-style-type: none"> <li>✓ Same as western route alternative;</li> </ul>	<ul style="list-style-type: none"> <li>× Very difficult to pass through the centre of the Eland Mine;</li> </ul>	4

\* Order of preference for route alignments, based on specialist study

In arriving at this determination, the impacts of the cost of servitude acquisition, the potential disruption to economic and social activity along the Western Route are estimated to be higher than that posed by the Eastern Route.

