

**PROPOSED BRAVO INTEGRATION PROJECT**

**SOCIAL IMPACT ASSESSMENT**

As part of the

**ENVIRONMENTAL IMPACT ASSESMENT PROCESS**

**DRAFT SIA REPORT**

**BRAVO 5**

**November 2008**



**Prepared by:**

MasterQ Research

Reg. No.: 2003/002350/07

**SOCIAL TEAM:**

MasterQ Research

[www.masterq.co.za](http://www.masterq.co.za)

Ms Nonka Byker

Mobile: 082 940 3694

Telephone: 011 477 3265

Fax: 086 612 8122

E-mail: [nonka@masterq.co.za](mailto:nonka@masterq.co.za)

Postal address:

49 Muller Street

Yeoville

2198

## EXPERIENCE RECORD

This report was compiled by **Ms Nonka Byker** of **MasterQ Research**. Ms Byker holds a *B.Psych (Adult Mental Health)* from the University of Pretoria and is a social impact assessment specialist with approximately 3 years experience in this field. She specialises in the assessment of potential social impacts, which includes the collection and analysis of data and superimposing a proposed project on a baseline social profile to determine the potential social impacts from which mitigation measures can be developed. In total she has approximately 10 years experience in the social development field, of which 7 years were spent as a public participation consultant. Ms Byker is registered with the Health Professions Council of South Africa (HPCSA) and is a member of the International Association of Impact Assessors South Africa (IAIASA).

Some of the Social Impact Assessments that Ms Byker has conducted on behalf of MasterQ Research included the following projects:

- Social Impact Assessment for the proposed liquid fuels transportation infrastructure from the Milnerton refinery area to the Ankerlig power station in the Atlantis Industrial area (Client: Eskom Generation, Project Manager: SSI).
- Social Impact Assessment for the proposed Thyspunt Integration Project (Client: Eskom Generation/Transmission, Project Manager: SiVEST).
- Social Impact Assessment with cognisance of potential tourism impacts for the proposed Matla-Jupiter-Sebenza 400kV transmission power line (Client: Eskom Generation/Transmission, Project Manager: SSI).
- Social Impact Assessment with cognisance of potential tourism impacts for the proposed Vryburg 400kV substation in the Northwest Province (Client: Eskom Generation, Project Manager: SSI).
- Social Impact Assessment for the proposed Mokopane Integration Project (Client: Eskom Generation/Transmission, Project Manager: Savannah Environmental).
- Social Impact Assessment for the proposed Steelpoort Integration Project (Client: Eskom Generation/Transmission, Project Manager: Savannah Environmental)
- Social Impact Assessment for the proposed Mercury-Ferrum transmission power line (Client: Eskom Transmission, Project Manager: Bohlweki Environmental)
- Social Impact Assessment for the proposed Ferrum-Garona transmission power line (Client: Eskom Transmission, Project Manager: Bohlweki Environmental)
- Social Impact Assessment for the proposed Steelpoort Pumped Storage Scheme (Client: Eskom Generation, Project Manager: Bohlweki Environmental)

## **DECLARATION OF INDEPENDENCE**

The EIA regulations (1182 and 1183, as amended) states, amongst other, that an independent consultant must be appointed to act on behalf of the client and to ensure that the public participation process is managed properly. In this regard MasterQ Research submits that it has:

- The necessary required expertise to conduct social impact assessments, including the required knowledge and understanding of any guidelines or policies that are relevant to the proposed activity;
- Undertaken all the work and associated studies in an objective manner, even if the findings of these studies are not favourable to the project proponent;
- No vested financial interest in the proposed project or the outcome thereof, apart from remuneration for the work undertaken under the auspices of the above-mentioned regulations;
- No vested interest, including any conflicts of interest, in either the proposed project or the studies conducted in respect of the proposed project, other than complying with the required regulations;
- Disclosed any material factors that may have the potential to influence the competent authority's decision and/or objectivity in terms of any reports, plans or documents related to the proposed project as required by the regulations; and

## EXECUTIVE SUMMARY

The proposed Bravo Integration Project is required as a means to integrate the additional electricity supply from the new Bravo Power Station into Eskom's current electricity network. The integration of this additional electricity into the network would ensure that areas such as Secunda and Midrand would be supplied with additional electricity. The proposed Bravo Integration Project will be considered within the Environmental Impact Assessment (EIA) studies. In this regard, five separate applications have been lodged with DEAT.

This particular report only focuses on **Bravo 5 (DEAT Ref. No: 12/12/20/1096)** and details the results of the Social Impact Assessment (SIA) specialist study conducted by MasterQ Research as part of the overall EIA process that is being conducted by Cymbian Environmental Social Consulting Services.

Bravo 5 entails the construction and operation of one (1) 400kV bypass transmission power line of approximately 10km in length on the Bravo-Vulcan transmission power line in order to bypass the Duvha power station.

Vanclay (2002) defined a **social impact assessment** as follows:

*"... the process of analyzing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment."*

Bearing this in mind, a **change process** can therefore be defined as change that takes place within the receiving environment as a result of an intervention. A potential **social impact** follows as a result of the change process occurring. However, a change process can only result in an impact once it is experienced as such by the individual/household/community/organisation on a physical and/or cognitive level.

The change processes which were assessed included the following:

- **Demographic processes:** changes in the number and composition of people;
- **Geographical processes:** changes in land use patterns;
- **Economic processes:** changes in the way in which people make a living and the economic activities in society;
- **Institutional and empowerment processes:** changes in the role, efficiency and operation of governments and other organisations, and people's ability to get involved and influence decision making processes; and

- **Socio-cultural processes:** changes in the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions.

This particular SIA also took into account the significance, spatial, duration, degree of probability and degree of certainty that a potential impact might have on the social environment. Impacts can either be negative, neutral or positive. The impacts are also categorised according to the various project stages, i.e. construction and decommissioning, and operation and maintenance. Mitigation measures have also been identified with the aim to reduce the potential negative impacts and to enhance the potential positive impacts.

In order to assess the alternatives in respect of its anticipated social impacts, a distinction was made between the following impacts:

- **Category 1:** Impacts that are not expected to differ between the proposed alternatives, e.g. the number of employment opportunities that might be created by the proposed project are expected to remain the same, irrespective of the chosen alternative (except in the case of the 'no go' option); and
- **Category 2:** Impacts that are expected to cause significant changes between the proposed alternatives, e.g. the need to resettle certain households increases proportionately if the development traverses densely populated areas as opposed to skirting sparsely populated areas.

For Bravo 5, three (3) possible alternative route corridors have been identified on the Bravo-Vulcan transmission power line to bypass the Duvha power station, of which only one (1) would be selected in the end as the preferred corridor. These corridors are as follows:

The **western alternative** deviates from the existing Duvha-Vulcan transmission power line just south of the N4. It then crosses the Witbank Dam in a south-westerly direction to meet up with the Duvha-Kendal transmission power line east of the R544.

The **central alternative** deviates from the Duvha-Vulcan transmission power line south of the N4. It then crosses the most eastern portion of the Witbank Dam in a south-westerly direction to meet up with the Duvha-Kendal transmission power line east of the R544. This alternative runs mostly parallel to, and approximately 1.2km east of, the western alternative.

The **eastern alternative** deviates from the Duvha-Vulcan transmission power line east of the Witbank Dam. It is the only alternative that does not cross the Witbank Dam. It meets up with the Duvha-Kendal transmission power line just west of the Duvha power station.

Transmission power lines are constructed and operated within a servitude that is established along its entire length (55m wide per 400kV transmission power line). The servitude gives Eskom Transmission right of way for that piece of land. Right of way should not be confused with a rental agreement. Right of way gives Eskom certain rights and controls that support the safe and effective operation of the power line.

The proposed transmission power line corridors are all located within the Emalahleni Local Municipality (MP312), which in turn forms part of the Nkangala District Municipality (DC31) of the Mpumalanga Province (MP).

In order to address the overall objective of this study, it was necessary to compile a detailed description of the study area. Therefore, in Section 3, every subsection provides a profile of the social processes in terms of demographic, geographical, economic, institutional and empowerment, and socio-cultural baseline conditions in the study area. Each subsection then concludes with a table summarising how the project is likely to change these baseline profiles, and the related impacts that could be expected as a result of the project.

### **Demographical Change Processes**

Demographic processes relate to the number of people and composition of a community and include an overview of the population size and the educational profile of the affected communities.

An overview of the population demographics of the study area in relation to South Africa as a whole, the province and the district revealed that there are more males than females in the study area. It is therefore necessary to take cognisance of the fact that both males and females might be seeking employment and that the majority of work seekers might not necessarily be exclusively male.

It is not expected that any significant demographical change processes will take place during either the construction or operation of the proposed bypass transmission power line.

### **Geographical Change Processes**

Geographical processes relate to land use patterns and infrastructure in the area. This section therefore describes the land use in the study area from a social perspective, specifically in terms of settlement patterns and land use developments.

The land use within the ELM has been divided into five main uses, namely business activities, industrial activities, mining areas, electricity and agriculture. The ELM IDP<sup>1</sup> states that the southern parts of the municipal area is known as the “Energy Mecca of South Africa”, which is as a result of rich coal deposits and coal reserves and the presence of a number of power stations. The area is further described as an urban and rural area, which includes large farms and dispersed urban settlements.

Geographical change processes refer changes in land use, whether it is on a temporary or permanent basis. The construction and operation of a transmission power line will lead to a change in the land use, mostly as a result of the surface infrastructure. The assessment of a

---

<sup>1</sup> Emalahleni Local Municipality IDP 2008/2009

land use change process from a social perspective takes into account how the proposed transmission power lines might affect the behaviour and/or lives of landowners and/or land users in the area.

It is expected that the eastern alternative might impact on the safety of an existing mining operation.

### **Economical Change Processes**

Economic processes relate to the way in which people make a living and the economic activities within that society. The employment status within a community gives an indication of the economic stability of such a community and also serves as an indicator of such a community's general well-being.

Overall it would appear as if the economy of the study area is growing at a steady pace. As economic industries are growing, more employment opportunities are created thereby further reducing the unemployment rate, creating sources of income which in turn leads to the creation of other opportunities such as further education, a need for housing (which in turn creates further employment opportunities, both directly and indirectly), etc.

As it is not expected that large scale employment opportunities would be created by the proposed bypass transmission power line, economical processes mostly related to compensation for the servitude and the potential impact on property values, notably on the residential development surrounding the Witbank Dam.

### **Institutional & Empowerment Processes**

Institutional and empowerment processes relate to the role, efficiency and operation of government sectors and other organisations within the area in terms of service delivery. It also investigates the ability of people to engage in decision-making processes to such an extent that they have an impact on the way in which decisions are made that would concern them.

It appears as if municipal service delivery has declined within the ELM between 2001 and 2007. The mostly likely explanation for this occurrence is that the municipal services were unable to keep up with the huge increase in the number of households, which had an average annual growth rate of 5 113 households (or 30 678 households between 2001 and 2007). Therefore, it would appear that municipal services are at a very vulnerable stage and that the municipal network might not be able to sustain additional connections to the network.

The municipal infrastructure is mostly located within the urban areas of the municipal areas. Municipal infrastructure backlogs are mostly confined to the previously disadvantaged township areas, and, as could be expected, in informal settlement areas. The outlying rural

areas rely almost exclusively on water and sanitation services that are below Reconstruction & Development Programme (RDP) standard. In terms of water services, RDP standard is defined as piped water either within a dwelling or within 200m of such a dwelling. Sanitation services on par or above RDP standard is defined as any waterborne sanitation services that are connected to a municipal sewerage system or a ventilated pit latrine (VIP) system.

In terms of baseline empowerment processes, the hierarchy of needs as set out by Maslow, offers an insightful backdrop in terms of people’s potential level of involvement in the EIA process and the issues that might be pertinent to them in a development of this nature. Therefore, in order to expect people to fully participate in a process that might affect their future, people would have to function on a higher level within the hierarchy of needs (the need for self esteem, characterised by knowledge and understanding needs as well as the need for an environment that is aesthetically appealing. This means that their basic needs have to be met first.

Negotiation for land is a change process on legal and empowerment level. The same applies to the stakeholders that will be involved in the public participation process. The EIA process is an opportunity for these stakeholders to give input into the process and project. However, stakeholders would have to offer up their time to become actively involved in the process and they should clearly understand their rights in terms of the process to enable them to use these rights.

### Socio-Cultural Processes

Socio-cultural processes relate to the way in which humans behave, interact and relate to each other and their environment, as well as the belief and value systems which guide these interactions.

‘Sense of place’ has been assessed as a socio-cultural change process.

### Expected Impacts

The significance of potential category 1 impacts is grouped per change process in Table A, while Table B reflects a summary of the potential category 2 impacts per change process.

**Table A:** Summary of Category 1 Impacts per Change Process

CHANGE PROCESS	ASSESSMENT AREA	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
<b>DEMOGRAPHICAL</b>			
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a
<b>Operation &amp;</b>	No impacts foreseen	n/a	n/a

<b>CHANGE PROCESS</b>	<b>ASSESSMENT AREA</b>	<b>SIGNIFICANCE (pre-mitigation)</b>	<b>SIGNIFICANCE (post-mitigation)</b>
Maintenance			
<b>GEOGRAPHICAL</b>			
Construction & De-commissioning	No impacts foreseen	n/a	n/a
Operation & Maintenance	No impacts foreseen	n/a	n/a
<b>ECONOMICAL</b>			
Construction & De-commissioning	Compensation for servitude	Low +	n/a
Operation & Maintenance	No impacts foreseen	n/a	n/a
<b>EMPOWERMENT &amp; INSTITUTIONAL</b>			
Construction & De-commissioning	Negotiation process	Moderate	Moderate +
Operation & Maintenance	No impacts foreseen	n/a	n/a
<b>SOCIO-CULTURAL</b>			
Construction & De-commissioning	No impacts foreseen	n/a	n/a
Operation & Maintenance	No impacts foreseen	Low -	Very low -

**Table B: Summary of Category 2 Impacts per Change Process**

Change Process	Assessment Area	Western Alternative		Eastern Alternative		Western Sub-Alternative	
<b>DEMOGRAPHICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>GEOGRAPHICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Mining operations	No impact	No impact	No impact	No impact	Low -	Low – to ±
<b>ECONOMICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Property values	Low -	Very low -	Low -	Very low -	No impact	No impact
<b>EMPOWERMENT &amp; INSTITUTIONAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	Na
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a

<b>Change Process</b>	<b>Assessment Area</b>	<b>Western Alternative</b>		<b>Eastern Alternative</b>		<b>Western Sub-Alternative</b>	
<b>SOCIO-CULTURAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Sense of place	Low -	Low -	Moderate -	Low -	Moderate -	Low -

## Conclusions and Recommendations

To come up with a preferred corridor, a comparison among the alternative corridor alignments was conducted by assessing all of the category 2 impacts identified with a certain change process. A summary of the outcome of this brief assessment is as per the table below.

Process	Change Process	Western	Central	Eastern
<b>Demographical</b>	No category 2 impacts	-	-	-
<b>Geographical</b>	Mining operations	0	0	1.98
<b>Economical</b>	Property values	1.62	1.62	0
<b>Institutional &amp; Empowerment</b>	No category 2 impacts	-	-	-
<b>Socio-Cultural</b>	Sense of place	2.4	2.16	1.38
<b>TOTAL</b>		<b>4.02</b>	<b>3.78</b>	<b>3.36</b>

Based on the comparison of category 2 impacts prior to mitigation, overall the **eastern alternative** emerged as the preferred route corridor from a social perspective. In general, the proposed bypass transmission power line will not pose any impacts of significance to the social environment during either the construction or the operational phases. Most impacts likely to occur during the construction phase are site specific (i.e. limited to the immediate surroundings of the project development site). However, the activities associated with these bypass transmission power lines pale in comparison to those associated with the construction of the actual Bravo Power Station as well as the construction that will take place on Bravo 3 and 4.

## ACRONYMS

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>CBD</b>	Central Business District
<b>CS</b>	Community Survey
<b>DEAT</b>	Department of Environmental Affairs and Tourism
<b>ELM</b>	Emalahleni Local Municipality
<b>EIA</b>	Environmental Impact Assessment
<b>EMF</b>	Electro Magnetic Fields
<b>EMP</b>	Environmental Management Plan
<b>ESTA</b>	Extension of Security of Tenure Act
<b>GDS</b>	Growth and Development Strategy
<b>GMLM</b>	Govan Mbeki Local Municipality
<b>GPS</b>	Global Positioning System
<b>HIV</b>	Human Immune-deficiency virus
<b>I&amp;APs</b>	Interested and Affected Parties
<b>ICNIRP</b>	International Commission for Non-Ionising Radiation Protection
<b>IDP</b>	Integrated Development Plan
<b>MP</b>	Mpumalanga Province
<b>NDM</b>	Nkangala District Municipality
<b>NEMA</b>	National Environmental Management Act
<b>OHSA</b>	Occupational Health and Safety Act
<b>PPP</b>	Public Participation Process
<b>RDP</b>	Reconstruction & Development Programme
<b>RoD</b>	Record of Decision
<b>SAFCEC</b>	South African Federation of Civil Engineering Contractors

<b>SAPS</b>	South African Police Service
<b>SDF</b>	Spatial Development Framework
<b>SIA</b>	Social Impact Assessment
<b>STI</b>	Sexually Transmitted Infections
<b>WHO</b>	World Health Organisation

## TABLE OF CONTENTS

<b>1. INTRODUCTION.....</b>	<b>18</b>
1.1. Definition of a SIA.....	19
1.2. Objectives of the Study .....	20
1.3. Approach and Methodology.....	21
1.3.1 Significance Rating Scales.....	22
1.4. Limitations and Assumptions.....	25
1.5. Applicable Legislation.....	26
<b>2. PROJECT BACKGROUND .....</b>	<b>27</b>
2.1 Project Overview.....	27
2.2 Transmission Power Line Corridors.....	28
2.3 Regional Overview.....	30
2.3.1 Provincial Level.....	31
2.3.2 District Level .....	31
2.3.3 Local Level.....	31
2.4 Negotiation Process .....	31
2.4.1 Expropriation.....	33
2.5 Construction Process.....	34
<b>3. SOCIAL CHANGE PROCESSES AND IMPACT ASSESSMENT.....</b>	<b>38</b>
3.1 Baseline Demographic Profile .....	38
3.1.1 Population.....	38
3.1.2 Education.....	41
3.2 Demographic Change Processes and Resultants Impacts.....	42
3.2.1 Expected Impacts.....	42
3.2.2 Construction and Decommissioning Phase .....	42
3.2.3 Operation and Maintenance Phase .....	42
3.3 Baseline Geographical Profile .....	43
3.3.1 Current Land Use.....	43
3.4 Expected Geographical Change Processes.....	45
3.4.1 Expected Impacts.....	46
3.4.2 Construction and Decommissioning Phase .....	47
3.4.3 Operation and Maintenance Phase .....	47
3.5 Baseline Economic Profile .....	48
3.5.1 Employment and Economic Sectors.....	49
3.5.2 Household and Personal Income .....	49
3.6 Economical Change Processes and Resultant Impacts .....	51
3.6.1 Expected Impacts.....	51

3.6.2	Construction and Decommissioning Phase .....	52
3.6.3	Operation and Maintenance Phase .....	55
<b>3.7</b>	<b>Baseline Empowerment and Institutional Profile .....</b>	<b>56</b>
3.7.1	Municipal Services .....	57
3.7.2	Empowerment and Participation.....	58
<b>3.8</b>	<b>Expected Empowerment and Institutional Change Processes.....</b>	<b>59</b>
3.8.1	Expected Impacts.....	60
3.8.2	Construction & Decommissioning Phases .....	61
3.8.3	Operation & Maintenance Phase.....	63
<b>3.9</b>	<b>Baseline Socio-Cultural Processes .....</b>	<b>63</b>
<b>3.10</b>	<b>Expected Social-Cultural Change Processes and Resultant Impacts.....</b>	<b>63</b>
3.10.1	Expected Impacts.....	63
3.10.2	Construction & Decommissioning Phases .....	65
3.10.3	Operation and Maintenance Phase .....	65
<b>4.</b>	<b>CONCLUSIONS.....</b>	<b>69</b>
4.1	Summary .....	69
4.2	Preferred Route Corridor.....	74
4.3	Recommendations.....	75
<b>5.</b>	<b>ENVIRONMENTAL MANAGEMENT PLAN: SOCIAL REQUIREMENTS.....</b>	<b>77</b>
<b>5.1</b>	<b>Geographical Change Processes .....</b>	<b>77</b>
5.1.1	Mining operations.....	77
<b>5.2</b>	<b>Economical Change Processes .....</b>	<b>77</b>
5.2.1	Compensation for servitude .....	77
5.2.2	Property values .....	77
<b>5.3</b>	<b>Empowerment and Institutional Change Processes .....</b>	<b>78</b>
5.3.1	Negotiation process .....	78
<b>5.4</b>	<b>Socio-Cultural Change Processes.....</b>	<b>78</b>
5.4.1	Sense of Place .....	78
<b>6.</b>	<b>SOURCES .....</b>	<b>79</b>
6.1	Project Documentation.....	79
6.2	Municipal Documentation .....	79
6.3	Other Documentation .....	79
6.4	Websites.....	80

## 1. INTRODUCTION

During 2007 Eskom received a positive Record of Decision (RoD) from the Department of Environmental Affairs and Tourism (DEAT) on their proposed Bravo Power Station. This RoD enables Eskom to proceed with the construction and operation of the new Bravo Power Station, which is located near the town of Bronkhorstspuit in the Gauteng Province.

The current project, namely the proposed Bravo Integration Project, is therefore required as a means to integrate the additional electricity supply from the new Bravo Power Station into Eskom's current electricity network. The integration of this additional electricity into the network would ensure that areas such as Secunda and Midrand would be supplied with additional electricity.

The proposed Bravo Integration Project will be considered within the Environmental Impact Assessment (EIA) studies. Five separate applications have been lodged with DEAT, which are as follows:

- **Bravo 1 (DEAT Ref. No: 12/12/20/1093):** The construction and operation of two (2) 400kV bypass transmission power lines, both approximately 10km in length, as follows:
  - One (1) 400kV bypass transmission power line between the Sol substation in Kriel and the Zeus substation in Secunda; and
  - One (1) 400kV bypass transmission power line between the Sol substation in Kriel and the Camden substation in Ermelo.
- **Bravo 2 (DEAT Ref. No: 12/12/20/1094):** The construction and operation of two (2) 400kV loop-in lines into the new Bravo Power Station, both approximately 10km in length, as follows:
  - One (1) 400kV loop-in line from the Kendal-Apollo transmission line (which runs between Ogies and Centurion); and
  - One (1) 400kV loop-in line from the Duvha-Minerva transmission line (which runs between Middelburg and Johannesburg).
- **Bravo 3 (DEAT Ref. No: 12/12/20/1097):** The construction and operation of a new 400kV transmission power line from the Bravo Power Station to the Lulumisa substation in Kayalami. This transmission power line will be approximately 90km in length.
- **Bravo 4 (DEAT Ref. No: 12/12/20/1095):** The construction and operation of two (2) new 400kV transmission power lines, both of which would be approximately 90km in length and would run parallel to each other, as follows:
  - One (1) 400kV transmission power line from the Kendal Power Station to the Zeus substation; and

- One (1) 400kV transmission power line from the Bravo Power Station to the Zeus substation.
- **Bravo 5 (DEAT Ref. No: 12/12/20/1096):** The construction and operation of one (1) 400kV bypass transmission power line of approximately 10km in length on the Bravo-Vulcan transmission power line in order to bypass the Duvha power station.

This particular report only focuses on **Bravo 5 (DEAT Ref. No: 12/12/20/1096)** and details the results of the Social Impact Assessment (SIA) specialist study conducted by MasterQ Research as part of the overall EIA process that is being conducted by Cymbian Enviro-Social Consulting Services. Separate Social Impact Assessment (SIA) Reports have been compiled for the Bravo 1-4 applications. In terms of Bravo 5, three (3) possible route corridor alternatives were identified for the proposed 400kV bypass transmission power line on the Bravo-Vulcan transmission power line.

The first subsection below gives a definition of a SIA, followed by details of the objectives of the study, whereas the third subsection details the approach and methodology that were followed to meet these objectives. The section is concluded with a discussion of the limitations and assumptions of the study, and applicable legislation.

### 1.1. Definition of a SIA

The definition of a SIA as defined by Vanclay (2002) gives an understanding of the backdrop against which this SIA was conducted. According to this definition, a **social impact** is defined as follows:

*“The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as physical reality, while other social impacts are perceptual or emotional.”*

Vanclay (2002) defined a **social impact assessment** as follows:

*“... the process of analyzing (predicting, evaluating and reflecting) and managing the intended and unintended consequences on the human environment of planned interventions (policies, programmes, plans and projects) and any social change processes invoked by those interventions so as to bring about a more sustainable and equitable biophysical and human environment.”*

According to Vanclay (2002:3-10), one of the pitfalls of many SIAs are that these studies refer to social change processes as social impacts. In this regard, Vanclay stated: “social change processes are set in motion by project activities or policies”, whereas social impacts

*“refer to the impacts actually experienced by humans in either a corporeal (physical) or cognitive (perceptual) sense.”*

Bearing this in mind, a **change process** can therefore be defined as change that takes place within the receiving environment as a result of an intervention. A potential **social impact** follows as a result of the change process occurring. However, a change process can only result in an impact once it is experienced as such by the individual/household/community/organisation on a physical and/or cognitive level.

It should therefore be noted that the social specialists conducting this study made a definite distinction between change processes and impacts.

## **1.2. Objectives of the Study**

The overall purpose of the SIA will be to contribute to the EIA in such a way that it will enable DEAT to make an informed decision on the way forward with the proposed project. The specific objectives were as follows:

- Gain an understanding of the proposed project, including the alternative alignments or route corridors, and the nature and timeframe of proposed activities;
- Obtain information on the baseline social profile characterising the study area in terms of the following change processes:
  - **Demographic processes:** the number and composition of people;
  - **Geographical processes:** land use patterns;
  - **Economic processes:** the way in which people make a living and the economic activities in society;
  - **Empowerment and institutional processes:** the ability of people to be involved and influence decision making processes; and the role, efficiency and operation of governments and other organisations; and
  - **Socio-cultural processes:** the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions;
- Identify how these processes might be changed by the proposed project and identify and describe the resultant impacts from such changes;
- Rate these impacts along specific significance rating scales in order to obtain an overall view of their relative severity and significance;
- Identify measures that could be implemented to prevent or ameliorate any negative impacts, or that can be used to enhance any positive impacts; and

- Present these mitigation/enhancement measures for inclusion in the Environmental Management Plan (EMP).

The approach and methodology that were followed to fulfil the objectives are listed in section 1.3 below.

### **1.3. Approach and Methodology**

To ensure that the objectives of the study are answered, data had to be collected. Primary and secondary data collection methods were used. Primary data included a field trip by motor vehicle on 13 November 2008 along the various proposed route corridors. The objectives of the site visit were for the social specialists to familiarise themselves with the surrounding receiving environment and to identify any social sensitive sites.

Secondary data mostly centred on a desktop study, in which the following documents were scrutinised:

- Locality maps;
- Census 2001 and Community Survey 2007 data to determine any significant social trends in the area;
- A aerial study of the affected area through the use of Google Earth (2007);
- The EIA Scoping Report;
- The Integrated Development Plans (IDP) of the affected District and Local Municipalities;
- The Spatial Development Frameworks (SDF) of the affected District and Local Municipalities; and
- Where available, a desktop study of the Growth and Development Strategies (GDS) of the affected District and Local Municipalities.

Information that was relevant to the project was identified and assessed from these sources, within the context of the construction, operational, and decommissioning phases of the proposed project. The construction and decommissioning phases have been grouped together, as it is believed that similar processes take place during these phases. However, during the decommissioning phase these processes take place in reverse, e.g. instead of a team erecting the transmission power line, they will now dismantle it. This report also only focuses on the bypass transmission power line alternatives on the Bravo-Vulcan transmission power line, known as Bravo 5.

### 1.3.1 Significance Rating Scales

This particular SIA also took into account the significance, spatial, duration, degree of probability and degree of certainty that a potential impact might have on the social environment. Impacts can either be negative, neutral or positive. The impacts are also categorised according to the various project stages, i.e. construction and decommissioning, and operation and maintenance. Mitigation measures have also been identified with the aim to reduce the potential negative impacts and to enhance the potential positive impacts. Also included in the assessment tables that follow in Section 3 is a rating of the significance of the impact.

To determine the significance of each identified issue, the following criteria were used.

**Significance**, which refers to the importance of impacts, and which has been defined as follows:

5	<b>Very High</b>	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4	<b>High</b>	Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3	<b>Moderate</b>	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	<b>Low</b>	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	<b>Very Low</b>	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity are needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the

		category represented on the scale, and if used, will replace the scale.
0	<b>No Impact</b>	There is no impact at all - not even a very low impact on a party or system.

**Spatial**, which refers to the physical extent of the impact, and which has been defined as follows:

5	<b>Global/National</b>	The maximum extent of any impact.
4	<b>Regional/Provincial</b>	The spatial scale is moderate within the bounds of impacts possible, and will be felt at a regional scale (District Municipality to Provincial Level).
3	<b>Local</b>	The impact will affect an area up to 5 km from the proposed route corridor.
2	<b>Study Area</b>	The impact will affect a route corridor not exceeding the Boundary of the corridor.
1	<b>Isolated Sites / proposed site</b>	The impact will affect an area no bigger than the route site.

**Duration**, which refers to the persistence of an impact on the environment, and which has been defined as follows:

1	<b>Incidental</b>	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	<b>Short-term</b>	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	<b>Medium term</b>	The environmental impact identified will operate for the duration of life of the line.
4	<b>Long term</b>	The environmental impact identified will operate beyond the life of operation.
5	<b>Permanent</b>	The environmental impact will be permanent.

**Degree of probability**, which refers to the likelihood of the impact occurring, and which has been defined as follows:

1	Practically impossible
2	Unlikely
3	Could happen

4	Very Likely
5	It's going to happen / has occurred

**Degree of certainty**, which refers to the specialists confidence of an impact occurring, and which has been defined as follows:

<b>Definite</b>	More than 90% sure of a particular fact.
<b>Probable</b>	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
<b>Possible</b>	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.
<b>Unsure</b>	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
<b>Can't know</b>	The consultant believes an assessment is not possible even with additional research.

In order for the impacts to be described in a quantitative manner in addition to the qualitative descriptions provided above, this was calculated as follows:

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} * \frac{\text{Probability}}{5}$$

The impact risk was then classified as follows:

RATING	IMPACT CLASS	DESCRIPTION
0.1 – 1.0	1	Very Low
1.1 – 2.0	2	Low
2.1 – 3.0	3	Moderate
3.1 – 4.0	4	High
4.1 – 5.0	5	Very High

In order to assess the alternatives in respect of its anticipated social impacts, a distinction was made between the following impacts:

- **Category 1:** Impacts that are not expected to differ between the proposed alternatives, e.g. the number of employment opportunities that might be created by the proposed project are expected to remain the same, irrespective of the chosen alternative (except in the case of the 'no go' option); and

- **Category 2:** Impacts that are expected to cause significant changes between the proposed alternatives, e.g. the need to resettle certain households increases proportionately if the development traverses densely populated areas as opposed to skirting sparsely populated areas.

#### **1.4. Limitations and Assumptions**

- This study was carried out with the information available to the specialist at the time of executing the study, within the available time frames and budget. The sources consulted are not exhaustive, and additional information which might strengthen arguments or contradict information in this report and/or identify additional information might exist.
- It was assumed that the decommissioning phase is similar to the construction phase, and therefore the decommissioning phase was not assessed separately.
- The specialists did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to the assessment.
- It was assumed that the motivation for, and the ensuing planning and feasibility studies of the project were done with integrity, and that the information provided to date by the project proponent, the independent environmental assessment practitioner and the public participation consultant was accurate.
- The statistics that informed this report were primarily taken from Census 2001 and the more recent Community Survey 2007. The comparative analyses of these sets of data should only be regarded as an indication of broad trends in the area, because of concerns about data integrity. The South African Statistics Council was concerned about the following regarding the Community Survey (2007):
  - Institutional population is merely an approximation to 2001 numbers and not new data;
  - Unemployment in the Community Survey is higher and less reliable because of questions that were asked differently;
  - Grants do not match the (SASSA) data and should be interpreted with great care;
  - Income includes unreasonably high income for children – presumably misinterpretation of the question, listing parents' income for the child; and
  - Distribution of households by province has very little congruence with the General Household Survey or last census.
- A number of systematic errors were observed in the statistical data, which included:

- An underestimate of men relative to women;
- An underestimate of children younger than 10 years;
- An excess of those aged 85+, in particular among men;
- Missing women aged 20–34 from the Coloured population;
- Misdistribution of the population by province;
- Excess of people aged 10–24 in Western Cape and Gauteng;
- A shortfall of women aged 20–34 in Free State, KwaZulu-Natal and Limpopo.

The council states (2008): *“In the absence of a comprehensive sampling frame, it is difficult to determine whether the differences are due to sampling error, biases or the reality that has changed beyond our expectations. There may be other variables that will require similar warnings after further interrogation.”*

### **1.5. Applicable Legislation**

Cognisance was taken of the following legal requirements and regulatory documents:

- Constitution of the Republic of South Africa, Act No. No. 108 of 1996;
- Construction Regulations under the Occupational Health and Safety Act (OHSA);
- Electricity Regulation Act, No 4 of 2006, section 27;
- Extension of Security of Tenure Act (Act 62 of 1997) (ESTA);
- National Environmental Management Act (NEMA), No. 107 of 1998, as amended and Environment Conservation Act, No. 73 of 1989, as amended; and
- The Environmental Impact Regulations of 21 April 2006.

The following section describes the project and study area and then proceeds to address the objectives of the study.

## **2. PROJECT BACKGROUND**

This section assesses the information relevant to the study area and the project. The first subsection provides an overview of the proposed project, followed by a description of the transmission power line route corridor alternatives, and then a general overview of the study area. The section concludes with an overview of the negotiation process, followed by an overview of the construction process.

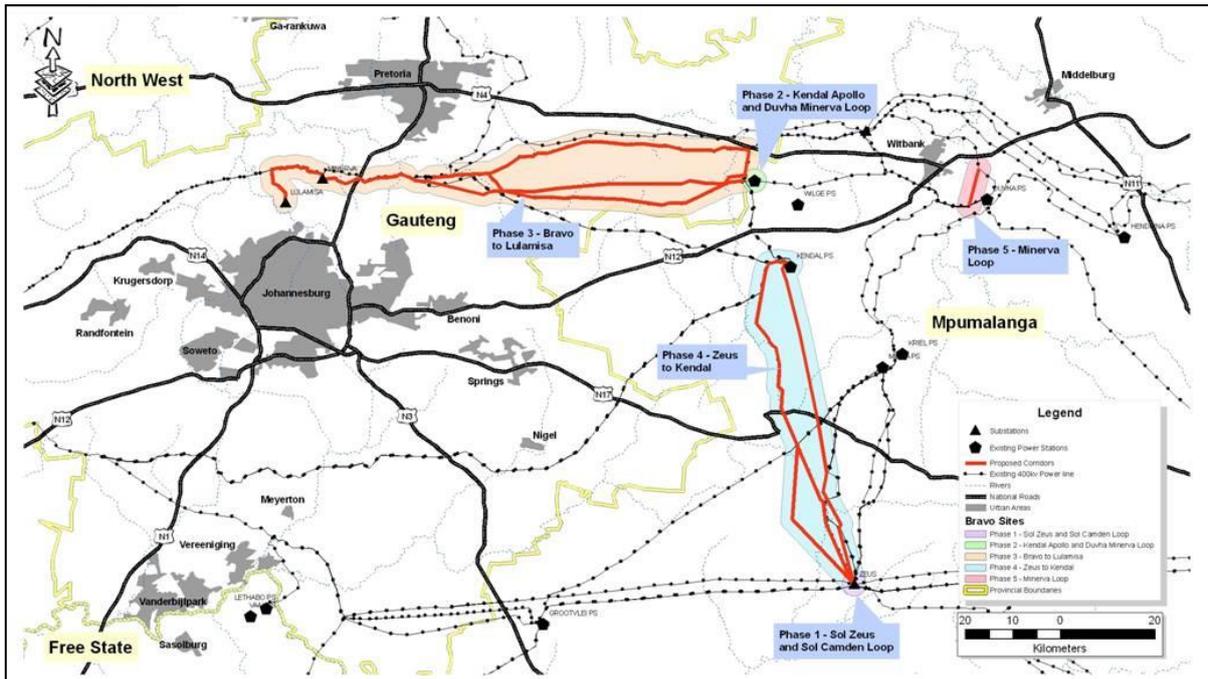
### **2.1 Project Overview**

Eskom Holdings Ltd. (Eskom) has been mandated to ensure a reliable and affordable electricity supply to consumers within South Africa. As such, they are responsible for both the generation as well as the distribution of electricity, which cannot be stored but has to be used as it is generated. To this end, the generated electricity has to be transmitted from the generation point to the end user and as such, it is required that the transmission capacity forms a balance between electricity supply and demand. Therefore, for Eskom Transmission to ensure that it fulfils its mandate and to provide the required infrastructural support to Eskom Generation, they have to plan, establish and expand their transmission power line infrastructure on a continuous basis.

As part of Eskom Transmission's expansion programme, they are proposing the establishment of a number of bypass, turn-in and transmission power lines (as outlined in the introduction), and known as the Bravo Integration Project. The main objective of this project is to integrate the new Bravo Power Station into the existing electricity grid.

As previously mentioned, five separate applications have been lodged with DEAT in terms of the various components of the proposed Bravo Integration Project. Figure 1 below provides an overview of the transmission power line corridor alternatives for the proposed Bravo Integration Project as a whole.

**Figure 1: Overview of the Bravo Integration Project**



Source: Cymbian Enviro-Social consulting services (based on information received from Eskom Transmission)

As this report only deals with the proposed bypass transmission power line corridor alternatives from the Bravo-Vulcan transmission power line (known as **Bravo 5**), the following subsection is confined to providing an overview of the applicable bypass transmission power line corridors.

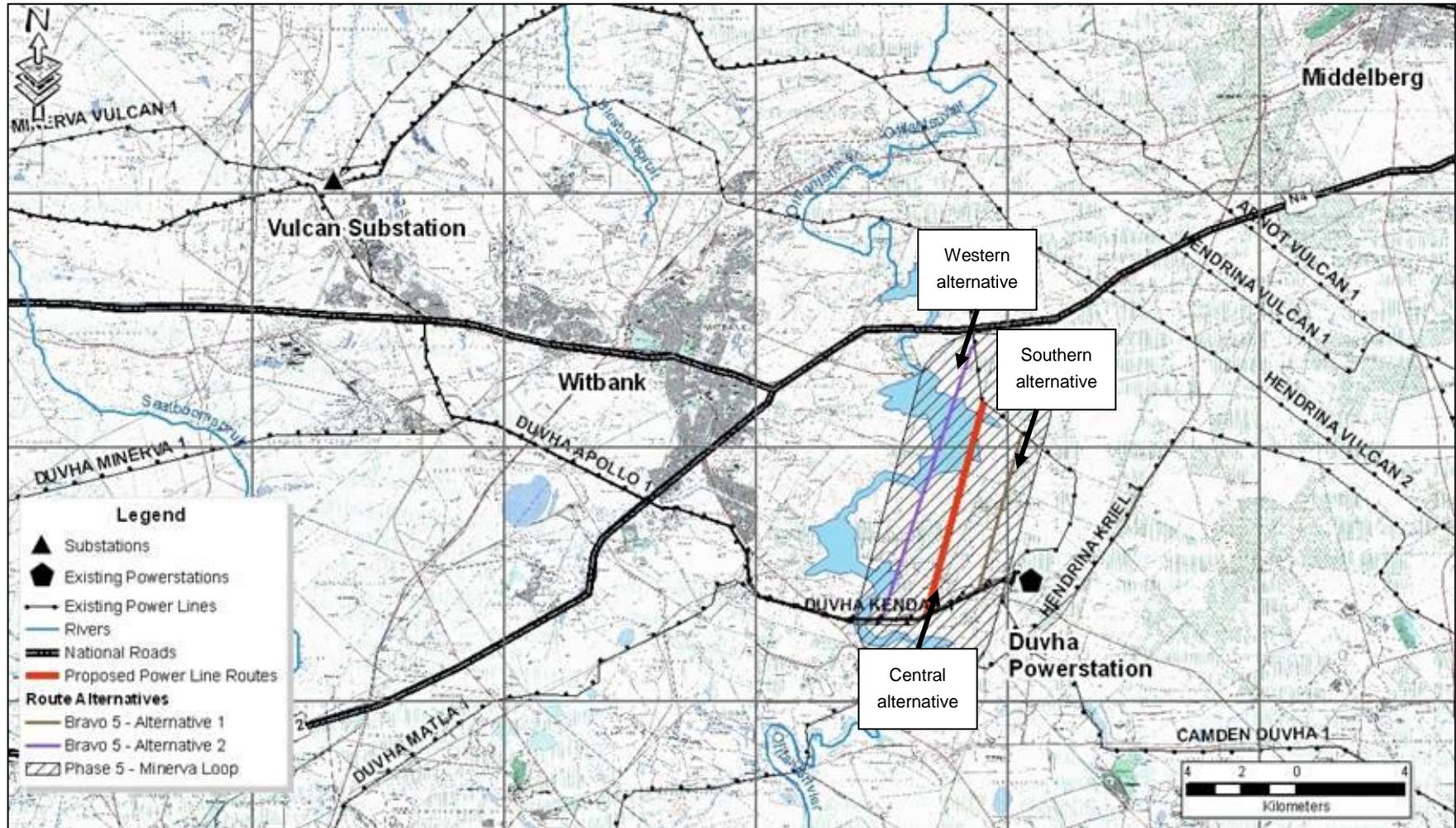
## 2.2 Transmission Power Line Corridors

**Bravo 5 (DEAT Ref. No: 12/12/20/1096)** entails the construction and operation of one (1) 400kV bypass transmission power line of approximately 10km in length on the Bravo-Vulcan transmission power line in order to bypass the Duvha power station.

Even though the permanent servitude for the transmission power lines would be 55m, the corridors under investigation is 5km wide (2.5km to either side of the central line) to ensure a comprehensive assessment process with the aim to identify any possible negative as well as positive impacts. For this reason, three (3) possible alternative route corridors have been identified on the Bravo-Vulcan transmission power line to bypass the Duvha power station, of which only one (1) would be selected in the end as the preferred corridor.

Figure 2 below provides an overview of these three alternative route corridors, known as Bravo 5, and which forms the subject of this SIA report.

Figure 2: Bravo 5 Alternative Route Corridors



Source: Cymbian Enviro-Social consulting services (based on information received from Eskom Transmission)

The **western alternative** deviates from the existing Duvha-Vulcan transmission power line just south of the N4. It then crosses the Witbank Dam in a south-westerly direction to meet up with the Duvha-Kendal transmission power line east of the R544.

The **central alternative** deviates from the Duvha-Vulcan transmission power line south of the N4. It then crosses the most eastern portion of the Witbank Dam in a south-westerly direction to meet up with the Duvha-Kendal transmission power line east of the R544. This alternative runs mostly parallel to, and approximately 1.2km east of, the western alternative.

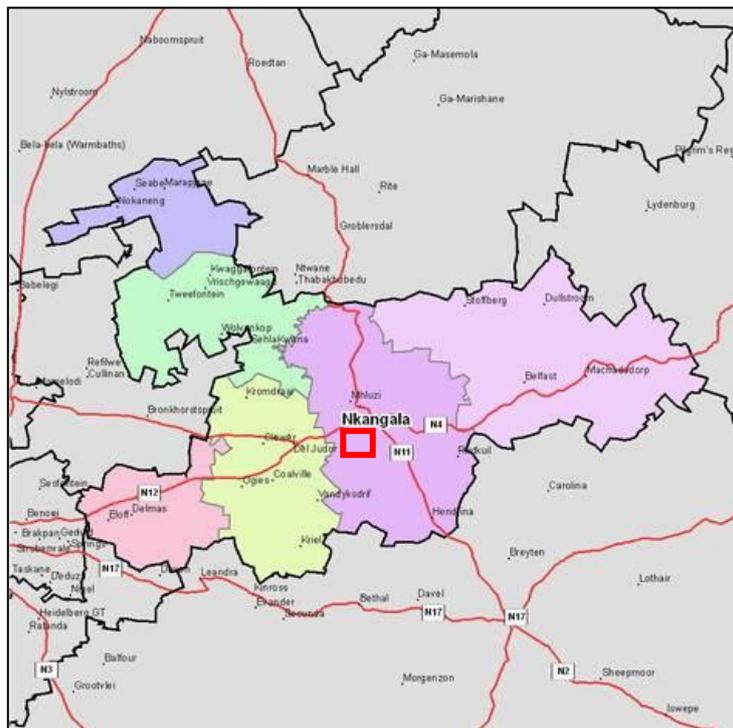
The **eastern alternative** deviates from the Duvha-Vulcan transmission power line east of the Witbank Dam. It is the only alternative that does not cross the Witbank Dam. It meets up with the Duvha-Kendal transmission power line just west of the Duvha power station.

### 2.3 Regional Overview

The proposed transmission power line corridors are all located within the Emalahleni Local Municipality (MP312), which in turn forms part of the Nkangala District Municipality (DC31) of the Mpumalanga Province (MP) (refer to Figure 3 – study area marked in red).

**Figure 3:** Municipal Delineation within the Nkangala District Municipality

Source: Municipal Demarcation Board



The following subsections provide a regional overview of the study area on a broad based provincial and district level. For a more detailed account of the receiving environment or potentially affected area (i.e. local municipal level), refer to relevant change processes under the various subsections in Section 3.

### **2.3.1 Provincial Level**

Mpumalanga has a land surface area of approximate 79 511.5km<sup>2</sup>, which represents approximately 6.5% of South Africa's total land surface. According to the Community Survey 2007<sup>2</sup>, the province is home to approximately 3 643 435 people, which represents a population growth of approximately 7.6% (or 277 550 people) over the 6-year period between 2001 (when the last census was conducted) and 2007. The population in Mpumalanga accounts for 7.5% of South Africa's total population of 48 502 063 people as of 2007. The province appears to be largely rural in nature, which is evident in the fairly low population density of 45.8 persons per km<sup>2</sup>.

### **2.3.2 District Level**

The Nkangala District Municipality (NDM) is located on the north-western border of Mpumalanga and consists of 6 local municipalities. The district covers an area of 16 892.6km<sup>2</sup> and is home to a population of approximately 1 226 498 people. This brings the population density in the district to 72.6 persons per square kilometre, which is almost double than that of the province as a whole. Of the 7 local municipalities within the NDM, only one, the Emahleni Local Municipality (ELM) is relevant to this study.

### **2.3.3 Local Level**

The ELM is located on the western border of the NDM. The area is landlocked with the Delmas Local Municipality to the west, the Thembisile Local Municipality to the north and the Steve Tshwete Local Municipality to the east. To the south lies the GMLM, which forms part of the GSDM. The ELM covers an area of approximately 2 678km<sup>2</sup> and consists of 32 wards. Some of the most notable towns within the ELM include Witbank, Ogies and Kriel.

## **2.4 Negotiation Process**

Transmission power lines are constructed and operated within a servitude that is established along its entire length (55m wide per 400kV transmission power line). The servitude gives Eskom Transmission right of way for that piece of land. Right of way should not be confused with a rental agreement. Right of way gives Eskom certain rights and controls that support the safe and effective operation of the power line.

The process of achieving the servitude agreement is referred to as the Servitude Negotiation Process, or just the negotiation process. This process is undertaken directly by Eskom Transmission. Important points relating to the EIA process are as follows:

---

<sup>2</sup> Statistics South Africa. Community Survey 2007: Key Municipal Data. Report No: 03-01-22 (2007)

- Servitude negotiation is a private matter between Eskom Transmission and the landowner concerned.
- The standard agreement can be expanded on depending on specific requests from the landowner.
- The negotiation process involves a number of stages, as outlined below, and culminates in the signing of a servitude agreement at which point Eskom Transmission enters into a legal agreement with the landowner.
- The agreements will detail such aspects as the exact location and extent of the servitude, and access arrangements and maintenance responsibilities.
- Compensation measures are agreed in each case.
- The negotiation process may take place at any time in the planning of a new line.
- This process must be completed (i.e. the agreement must be signed) before construction starts on that property.
- The negotiation process is independent of the EIA process.

The EIA process has become important in the initial planning and route selection of a new Transmission power line. For this reason, it would normally be preferable that the negotiation process begins after the EIA has been completed. At this stage there is greater confidence in the route to be adopted, and it would be supported by environmental authorisation.

However, it may be required that the negotiation process needs to start earlier, and may begin before or run in parallel to the EIA process. This may be due to tight timeframes, knowledge of local conditions and constraints, etc. Eskom Transmission has a right to engage with any landowner at any time, though they do so at risk if environmental authorisation has not been awarded.

The following process represents the steps that are followed in registering the servitude:

- The route is usually finalised before negotiation starts.
- Negotiators determine which properties are affected by the final route.
- The Survey-General is contacted to verify and confirm the properties to be affected.
- The Deeds Office provides the names of the legal owners of the properties.
- The services of an external property valuator are procured. Properties are valued by doing a strip valuation for which price ranges for the different properties are submitted.
- Maps are drafted for each property indicating the proposed route for the Transmission power line to be constructed on private or tribal land. The route is between 200 and 500m in width, which is based on international guidelines relating to the health and safety aspects of transmission power line installations.

- Eskom draws up an option to secure the servitude. The option indicates that the owner will accept that the line will cross his property, subject to conditions to be finalised in the negotiation of the servitude agreement. An option is valid for one year. The value of the land to be negotiated is calculated by multiplying the area of the servitude required from the landowner with the valuator's unit price.
- Eskom's negotiators visit the landowners to start negotiations. The documentation, including the map of the affected area and the option are used to start negotiations. If landowners are not aware of the proposed line to be constructed on their property, the negotiator explains the procedures and conditions to them.
- The landowner signs the option. Special conditions are negotiated and added to the standard option form.
- Once the route is confirmed (i.e. options signed with the upstream and downstream affected landowners), the servitude agreement will be finalised with the landowners. This agreement will set out the compensation amount, and conditions for the establishment and operation of the servitude, and will be site specific (different landowners may have different requirements). Compensation payments are made when the servitude is registered at the Deeds office. If no agreement can be reached between Eskom and the landowner and all other avenues to resolve the issues has been investigated and failed, Eskom applies for expropriation of the land (see section 2.4.1). A full EIA has to be completed before an application of expropriation can be logged. This is not a preferred option for Eskom.
- Once the construction is complete and the land rehabilitated to the landowners' satisfaction, the landowner signs a 'Final Release' certificate.
- Once the clearance certificate is signed, the responsibility for the line and servitude is handed over to the regional Eskom Transmission office. Prior to this the Eskom national office is responsible for the process.
- If the landowner is not satisfied with the construction process, conditions cannot be renegotiated. However, the landowner can refuse to sign the 'Final Release' certificate should the rehabilitation of the land not have been done to a satisfactory level (i.e. to a similar condition as before the construction started).

#### **2.4.1 Expropriation**

Expropriation will only take place once the negotiation process has reached a deadlock and/or after a maximum period of 90 days have lapsed after the commencement of the negotiation process with a particular landowner and resolution has not been reached. However, Eskom aims to avoid expropriation as this process is time consuming and tedious. Apart from the delay in construction as a result of expropriation, Eskom does not prefer to

follow the expropriation route as they believe that it damages their relationship with landowners. In the interests of minimising the impact of expropriation, Eskom will make all attempts to be flexible towards unique circumstances as it is believed that such an approach would mitigate the risk of landowners refusing the registration of the servitude on their respective properties.

If required, expropriation will take place in accordance with the Expropriation Act (Act 63 of 1975) where the basis for compensation is outlined as follows:

*(1) The amount of compensation to be paid in terms of this Act to an owner in respect of property expropriated in terms of this Act, or in respect of the taking, in terms of this Act, of a right to use property, shall not, subject to the provisions of subsection (2), exceed—*

*a. in the case of any property other than a right, excepting a registered right to minerals, the aggregate of—*

*i. the amount which the property would have realized if sold on the date of notice in the open market by a willing seller to a willing buyer; and*

*ii. an amount to make good any actual financial loss caused by the expropriation.*

*b. in the case of a right, excepting a registered right to minerals, an amount to make good any actual financial loss caused by the expropriation or the taking of the right.*

## **2.5 Construction Process**

The construction process follows on negotiations with landowners in which the servitude is secured.

There are a number of variables determining the sequence of events in the construction process, the number of people involved in each activity and the time spent on an activity. These variables include the timeframes for completion of the line, the natural environment and other local conditions. Some activities could happen simultaneously.

When the construction of the line starts, each activity will follow the previous one, so that a chain of events, with different teams involved will happen over time. On average, there are some 35 active days of construction at any point. However, this may take place over a period of up to two years.

At the EIA phase, prior to negotiations, the route of the line is investigated for approval by DEAT. Once approval is obtained, the following steps represent the process of construction:

1. The route is surveyed. This is done by air as well as by walking the route.
2. A profile of the line is designed based on soil conditions and other factors. At this stage decisions are made on conductor types, towers, insulators and foundations to be used.

3. Environmental review stage – a “walk-through” survey of the route is undertaken in order to determine any site-specific sensitivities which must be taken into account during the final placement of the towers and the construction and operational phases.
4. A final design of the line is made and placement of towers determined.
5. Tenders are issued and awarded to one or more construction companies.
6. Negotiations with landowners regarding access to the servitude during the construction phase are started. Access plans are drafted and signed by Eskom, the contractor and the landowner. At these discussions, the parties agree on rehabilitation measures to be implemented after construction. Photographs of the applicable infrastructure or land is taken beforehand to ensure that rehabilitation is done to the agreed upon standard. Access roads are established through recurring use – blading or scraping of a new road should not be expected, but this is site dependent.
7. The centre line is pegged. At this stage requirements and locations of new gates are recorded.
8. Bush clearance is done along the centre line. The width of the line to be cleared differs depending on the vegetation and the landscape of the area as well as on landowners’ requirements. At each tower position, four strips are cleared (size depends on the type of tower to be erected) for assembly and erection of the tower. The bush clearance team(s) move through the whole length of the line. However, the time needed to finish this activity depends on the vegetation of the area. During bush clearance protected species are identified and appropriately handled. Certain plants could be salvaged and relocated while alien species are eradicated. Cut material is cleared from the servitude and appropriately disposed of.
9. New gates are often installed when bush clearance is done.
10. Before the contractor starts with the foundations of the towers, the towers should have been pegged. A surveyor is appointed to do this. When pegging is being done, the footing of the tower is set out. Any obstacles or potential problems with the tower positions and the consequent moving of tower positions are reported.
11. The first step in putting the foundations for the towers in place is in establishing foundation nominations. At this stage, soil types are checked to determine foundation requirements. Trial foundations are dug at the main foundation points. This is done through mechanical back-actor / auger methods. However, in certain circumstances manual labour is used.
12. Foundations are excavated mechanically with a back-actor where possible. At this stage it looks like a square pit of up to 4mx4m in areas and 4m deep, depending on soil conditions. The pit will be covered up or fenced off after it has been dug until the foundation is cast. This is done to prevent livestock from falling into these pits.

13. The foundation steelwork is fitted into the foundation pit not too long after it has been dug. This is done to reinforce the foundations. The steelwork is made up at base camp and brought to site by truck. However, all fitting and wiring is done on site.
14. The concrete for the foundations is poured after the steelwork has been fitted. Shuttering (which is a structure generally made of timber in which liquid concrete is placed, compacted, and allowed to harden) is done and a standard concrete truck used to cast the concrete. A 28-day period is required for curing after concrete has been laid. Where access problems exist, concrete may need to be mixed on site. Helicopters may need to be used in exceptional circumstances. During this stage, access or service roads will be used extensively.
15. Tower steelwork is delivered in sections by long trucks and assembled on site. One truck transports one tower section directly from the factory to site. Access roads are clearly marked to ensure that the correct tower is delivered to site.
16. Towers are assembled on site by an assembly team. The steelwork is fitted and assembled on the ground using a crane – thereby necessitating the area to be cleared of vegetation around the tower. At the time of the study it was not clear if a lay-down area would be required and if such a lay-down area would be cleared of any vegetation. These areas will be considered from an environmental perspective during the walk-through survey (refer to point 3). Once the nuts are punched, non corrosive paint is placed on the nuts.
17. Towers are erected with cranes. The size of these cranes starts at 50 tons. It is presumed that a flat area is required from which the crane could be operated. However, it was not clear if vegetation clearance would be required.
18. After towers have been erected, the stringing of the cables begins. Cable drums are placed next to each other and stringing takes place in both directions from the drum stations. Up to 4km can be strung from one station in each direction. The working area at each drum station can be as long as 130m but will be confined to the servitude width. Intensive vehicle movement may take place within this working area. A pilot tractor places the pilot cable on the ground, which is pulled up through the use of a pulley. Conductors must not touch the ground as this will result in damage which will impact on the operation of the line. In mountainous areas, a helicopter can be used for stringing or the pilot rope can be shot across valleys.
19. The line is tensioned from each cable station to ensure minimum ground clearance heights required for the particular power line in question are achieved.
20. Rehabilitation of the construction site (mainly the servitude) is a continuous process. However, final rehabilitation starts after about 100 towers have been strung. The contractor is required to give one year's guarantee on their work, in which time

rehabilitation must be concluded. Each landowner has to sign a release form once their area has been rehabilitated, indicating that they are satisfied that everything has been left as agreed. Quotations are sourced and a proposal prepared to reimburse landowners for damages, if required. The proposal goes through a tender committee at which the payment is approved. All damages, including damages to crops must be paid and also signed off by the landowner.

21. A final inspection is done by Eskom together with the affected landowner to determine whether rehabilitation has taken place to the satisfaction of the landowner.

Some of the initial activities only involve a limited number of specialised people that moves through the servitude. It is only when bush clearance starts that larger numbers of construction workers come onto site. The following teams are active on site:

- **Bush clearance team:** Consisting of between 10–20 people, depending on local conditions (e.g. less people would be needed in the Karoo than in the bushveld). This team could also be involved in erecting gates. If a separate team put up gates, a team size of around 5 people could be expected. The potential for recruiting local labour for these teams is extensive.
- **Foundations team:** Consisting of between 35–45 members per team. More than one team could be used to accelerate construction. Although there is an opportunity for local labour to be recruited in this team, it is limited to unskilled activities.
- **Assembly team:** Consisting of between 10–25 people per team. More than one team could be used to accelerate construction. Limited potential for recruitment of local labour exists as this task largely requires skilled labour.
- **Erection team:** Size 15 – 20 people per team. No potential for recruitment of local labour as highly skilled teams are required for this task.
- **Stringing team:** Consisting of approximately 120 people. Limited potential for recruiting local labour as this task largely requires skilled labour.
- **Rehabilitation team:** Consisting of between 5–15 people, depending on site conditions. These teams could be involved in different activities. Limited potential for recruiting local labour as this task largely requires skilled labour.

### 3. SOCIAL CHANGE PROCESSES AND IMPACT ASSESSMENT

In order to address the overall objective of this study, it was necessary to compile a detailed description of the study area. The first subsection below provides a profile of the social processes in terms of demographical, geographical, economical, institutional and empowerment, and socio-cultural baseline conditions in the study area. Each subsection concludes with a table summarising how the project is likely to change these baseline profiles, and a detailed assessment of the related impacts that could be expected as a result of the project.

A change process can be defined as change that takes place within the receiving environment as a result of a direct or indirect intervention. A potential impact follows as a result of the change process. However, a change process can only result in an impact once it is experienced as such by an individual/community on a physical and/or cognitive level.

#### 3.1 Baseline Demographic Profile

Demographic processes relate to the number of people and composition of a community and include an overview of the population size and the educational profile of the affected communities.

Unless otherwise stated, the baseline social profile was compiled based on data obtained from Census 2001 and the Community Survey (CS) 2007. It is important for readers to note that CS data does not replace Census data, but that the CS is merely an attempt to adjust measurements to a best estimate. In this regard, Statistics South Africa has stated the following: *“Any adjustment done [in CS 2007] has maintained the profiling of the community in terms of the people and households while compensating and correcting the undercounted bias by different projections on national, provincial and municipalities.”*<sup>3</sup>

Therefore, please bear in mind that the following data should only be viewed as indicative of the broad trends within the area and not as a rigid representation of the area.

##### 3.1.1 Population

The ELM covers an area of approximately 2 678km<sup>2</sup> and in 2007 had a total population of 435 217 people. Compared to the population size of 2001, when the population stood at approximately 276 413 people, this means that the population size within the ELM increased at an average rate of 26 467 people per annum or a total of 158 804 over the 6-year period between 2001 and 2007. This population increase also brought about a change in the

---

<sup>3</sup> Statistics South Africa: Community Survey 2007: Key Municipal Data: ix.

population density in the area from 103.2 persons per km<sup>2</sup> in 2001 to 162.5 persons per km<sup>2</sup> in 2007.

Although the population density within both areas increased significantly, such population densities are still regarded as fairly low when compared to an urban area such as Johannesburg where the population density in 2007 stood at approximately 2 364 people per km<sup>2</sup>.

When considering the households within these areas, the following definition was applied: *“One or more people occupying a housing unit as their usual place of residence. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people who share living arrangements”*.<sup>4</sup>

In 2001, the ELM had a total of 74 917 households which increased steadily at a rate of 5 113 households per annum to a total of 105 592 households in 2007. It seems that the number of households developed more or less on par with the population growth rate so that there has been an average increase of approximately 0.4 persons per household over the 6-year period between 2001 (when the average number of persons per household was estimated at 3.7) and 2007 (an average of 4.1 persons per household).

The predominant population groups remained the same between 2001 and 2007 and are therefore still Black African (85.8%), followed by White (12.7%). The population growth rate amongst the Black African population is faster than that of the White group (which decreased by 3.2% between 2001 and 2007).

The same sort of phenomenon can be found amongst the gender distribution in the study area. In 2001 there was an almost equal split between the male and female ratio (with males dominating slightly at 50.6%). The gender ratio has since been surpassed by the males so that in 2007 males dominated at 51.1%.

More than two thirds (approximately 70%) of the total population of the study area fall within the working age category, which is defined by Statistics South Africa as the ages between 15 and 64.

Table 2 below provides an overview of the population demographics of the study area in relation to South Africa as a whole, the province and the district. From this table it is evident that there are more males than females in the study area. It is therefore necessary to take cognisance of the fact that both males and females might be seeking employment and that the majority of work seekers might not necessarily be exclusively male.

---

<sup>4</sup> [irhr.ua.edu/blackbelt/glossary.html](http://irhr.ua.edu/blackbelt/glossary.html)

**Table 2: Summary of Population Characteristics**

	South Africa	MP	NDM	ELM	
	2007			2001	2007
Area size (km <sup>2</sup> )	1 219 912	79 511.5	16 892.6	2 678	
Total population	48 502 063	3 643 435	1 226 498	276 413	435 217
				Average decrease of 26 467 persons per annum	
Population density (people per km <sup>2</sup> )	39.8	45.8	72.6	103.2	162.5
				Average increase of 9.9 persons per km <sup>2</sup> per annum	
Total households	12 500 610	940 403	305 566	74 917	105 592
				Average increase of 5 113 households per annum	
Avg. persons per household	3.9	3.9	4.0	3.7	4.1
Predominant Population Groups	Black African (79.5%) <sup>4</sup>	Black African (92.0%) White (6.8%)	Black African (90.9%) White (7.8%)	Black African (82.2%) White (15.9%)	Black African (85.8%) White (12.7%)
				Average increase of 24 381 Black Africans p.a., with an equal increase of 3.6% proportion of total population. Average decrease of 1 866 Whites p.a., with an equal decrease of 3.2% proportion of total population.	
Predominant Gender	Female (50.8%) <sup>5</sup>	Female (51.4%)	Female (50.1%)	Male (50.6%)	Male (51.5%)
				Male population growing faster than female population.	
Predominant Age Group	Working age (% unknown)	Working age (62.0%)	Working age (64.3%)	Working age (68.8%)	Working age (69.1%)

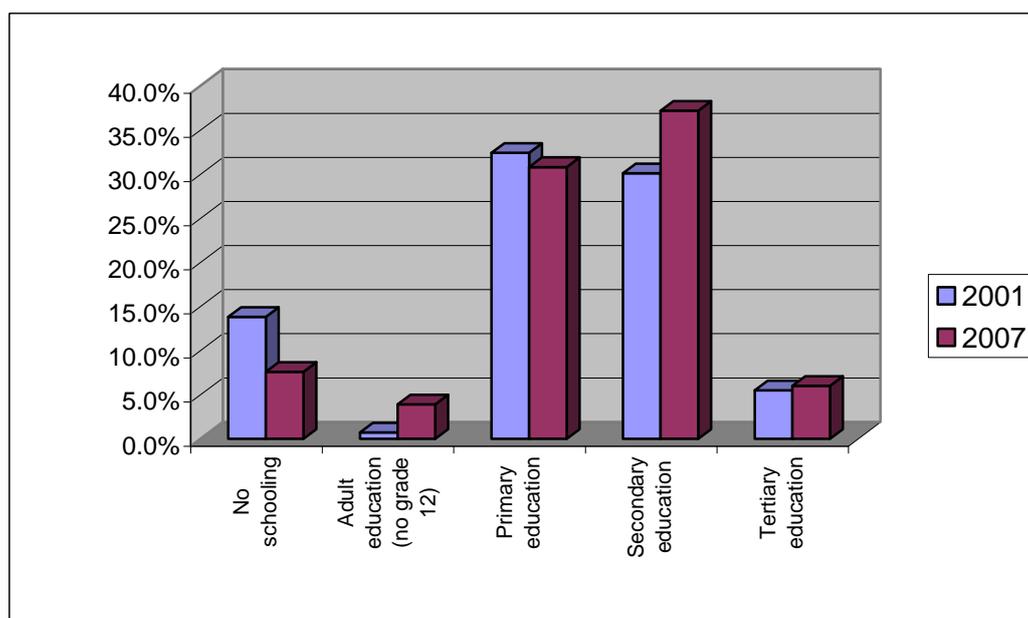
<sup>5</sup> Census 2001 data (2007 data not readily available)

	South Africa	MP	NDM	ELM	
	2007			2001	2007
				Working age population increased by an average of 18 409 persons p.a., and proportionally increased by 0.05% p.a.	

### 3.1.2 Education

An overview of the educational profile for the study area on local municipal level is provided in Figure 4. Overall it would appear as if the area is characterised by a semi-skilled to skilled population, which is reflected in the fact that, in 2007, only a small minority (7.6%) of the population has had no form of formal education.

**Figure 4:** Comparative educational profile (Grouped) for the Study Area



When considering the educational levels reported for the total population of the study area between 2001 and 2007, the number of people who attended and/or completed a primary level education, decreased as reflected in figure 4 above. On the upside, the number of people who have had no schooling also decreased, while at the same time the number of people who completed some form of secondary education increased by 7.1%.

The number of people who obtained a higher (post-Grade 12) qualification also increased by 0.5%. The increase in the secondary and tertiary educational levels could be as a result of a need to get out of the poverty cycle, whereby people might realise that some form of education might be beneficial.

One of the driving forces behind social change is educational attainment, which in turn is linked to poverty levels as there appears to be a correlation between the level of educational attainment and income levels. People with higher educational levels tend to be economically better off, and therefore contribute more to the reduction of the unemployment rate. Educational attainment is also linked to poverty in the sense that funds are required to further studies, therefore people living in less favourable economic conditions tend to be unable to further their education, which in turn holds them in a downward poverty spiral.

### 3.2 Demographic Change Processes and Resultants Impacts

It is expected that the construction and operation of the proposed transmission power lines will lead to a change in the number and composition of the population within the affected areas, which in turn may impact on health, safety and community cohesion (these impacts are discussed in more detail in the socio-cultural section).

#### 3.2.1 Expected Impacts

Table 3 below provides an overview of the expected change process to occur as well as the expected impacts that might occur as a result of these change processes taking place.

**Table 3:** *Expected Demographic Change Processes*

DEMOGRAPHIC CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Population change</b>	Will the development lead to an increase in numbers of a certain section of the population, e.g. migratory workers?		X	No impact foreseen.
<b>In-migration of unemployed work seekers</b>	Will the development intentionally or unintentionally contribute to the in-migration of work seekers into the area?		X	No impact foreseen.
<b>Relocation or displacement of individuals or families</b>	Will the development at this or future stages lead to the relocation of residents?		X	No impact foreseen.

#### 3.2.2 Construction and Decommissioning Phase

No impacts are foreseen during this phase of the project.

#### 3.2.3 Operation and Maintenance Phase

No impacts are foreseen during this phase of the project.

### **3.3 Baseline Geographical Profile**

Geographical processes relate to land use patterns and infrastructure in the area. This section therefore describes the land use in the study area from a social perspective, specifically in terms of settlement patterns and land use developments.

Land use is defined as “the way land is developed and used in terms of the types of activities allowed (agriculture, residences, industries, etc.) and the size of buildings and structures permitted. Certain types of pollution problems are often associated with particular land uses, such as sedimentation from construction activities”.<sup>6</sup>

Another definition of land use is as follows: “Patterns of land use arise naturally in a culture through customs and practices, but land use may also be formally regulated by zoning, other laws or private agreements such as restrictive covenants”.<sup>7</sup>

#### **3.3.1 Current Land Use**

The ELM IDP<sup>8</sup> states that the southern parts of the municipal area is known as the “Energy Mecca of South Africa”, which is as a result of rich coal deposits and coal reserves and the presence of a number of power stations. The area is further described as an urban and rural area, which includes large farms and dispersed urban settlements.

The land use within the ELM has been divided into five main uses, namely business activities, industrial activities, mining areas, electricity and agriculture. These land uses will be discussed briefly.

The following subsections briefly describe the current land use in the towns and areas in the immediate vicinity and/or in close proximity to the proposed transmission power line corridor alternatives. Unless otherwise stated, the information was adapted from the ELM IDP.

##### **3.3.1.1 Business Activities**

The eMalahleni Central Business District (CBD) is the primary business centre within the ELM. The area includes offices, retail, general businesses and commercial uses. The most prominent focal point within the ELM is the junction between the N12 and the N4, which the ELM believes offers opportunities for further business and commercial development. This junction offers a highly visible site of approximately 89ha, for which there is a high demand for high tech industrial and office development. Apart from the eMalahleni CBD, business nodes can also be found in areas such Ga-Nala and Ogies, which has offices, retail and

---

<sup>6</sup> [www.soil.ncsu.edu/publications/BMPs/glossary.html](http://www.soil.ncsu.edu/publications/BMPs/glossary.html)

<sup>7</sup> [www.wikipedia.org/wiki/Land\\_use.html](http://www.wikipedia.org/wiki/Land_use.html)

<sup>8</sup> Emalahleni Local Municipality IDP 2008/2009

general business uses. These two centres mostly serve as business areas to the surrounding farms.

### **3.3.1.2 Industrial Activities**

The nine industrial areas in the ELM are all mostly centred in and around the town of eMalahleni. These nine areas also constitute the largest concentration of industrial areas in the whole district. The development of these areas is constrained as a result of the presence of undermining, which is viewed by the ELM as a huge constraint as there is a demand for industrial sites within the area.

### **3.3.1.3 Mining areas**

The central and southern portions of the ELM are characterised as mining areas, with large parts of the area affected by shallow undermining. Also, a number of mines in the area closed down, which had significant environmental impacts in the form of sinkhole formation, subsiding, underground fires and water seepage. Mine closure also gave rise to economic impacts with large scale retrenchments which in turn lead to the closure of mining towns.

### **3.3.1.4 Electricity**

Eskom developed a number of power generating facilities within the ELM, mainly as a result of the presence of rich coal reserves within the ELM. The presence of these power stations lead to the development and expansion of towns such as Ga-Nala, Thubelihle, and Wilge (which closed down).

### **3.3.1.5 Agriculture**

The rural areas of the ELM consist mostly of farms and agricultural holdings, characterised by cattle farming and maize farming. Agricultural holdings are mostly located on the periphery of the urban areas.

Figures 5 and 6 below provide an overview of the current land use within the study area.

**Figure 5:** Land use surrounding the Dhuva power station



**Figure 6:** Land use east of the R544

### 3.4 Expected Geographical Change Processes

Geographical change processes refer changes in land use, whether it is on a temporary or permanent basis. The construction and operation of a transmission power line will lead to a change in the land use, mostly as a result of the surface infrastructure. The assessment of a land use change process from a social perspective takes into account how the proposed transmission power lines might affect the behaviour and/or lives of landowners and/or land users in the area.

### 3.4.1 Expected Impacts

Table 4 below provides an overview of the expected change process as well as the expected impacts that might occur as a result of the change process taking place.

**Table 4: Geographical Change Processes**

GEOGRAPHICAL CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Access to environmental resources</b>	Will the development impact on people's access to environmental resources, such as water, wood, medicinal plants etc?		X	No impact foreseen.
<b>Change in access to resources that sustain livelihoods</b>	Will the development impact on people's (legal or illegal, formal or informal) access to environmental resources that help to sustain their livelihoods, e.g. grazing land for their cattle; wood for heat/cooking/selling, etc.?	X		Transmission power lines should avoid mining activities due to the possibility of slumping and underground fires. Also, towers pose a risk to mining activities in the form of towers falling over, with health and safety as well as economic impacts as a result. In turn, the mining activities might also pose a risk to the safety of the Transmission power line; if for example, blasting takes place at the mining operation. At least 1 existing mining operation have been identified that will be affected by the eastern alternative.
<b>Land acquisition and disposal, including availability of land</b>	Will the development contribute to or directly impact on the ability of local residents to keep or acquire property/land?		X	No impact foreseen.
	Will the development set a precedent for change in land use in the area?		X	No impact foreseen.
	Are there any potential land-claims for the area?		X	No impact foreseen.
	Will the development affect the claims process?	-	-	Not applicable.

### 3.4.2 Construction and Decommissioning Phase

No impacts are foreseen during this phase of the project.

### 3.4.3 Operation and Maintenance Phase

The geographical change processes that are expected during this phase of the project are as follows:

- **Mining**

Mineral rights holders have rights to the surface area as well as far as they need the surface area to exercise their right to extract minerals. Therefore, any structures on the mineral rights surface areas have to be approved by the holders of these rights.

Blasting takes place on a regular basis at open cast mining areas, as is associated with many of the mines in the area. Therefore mining operations could have a negative impact on the Transmission power line itself due to blasting (i.e. flying rocks that could potentially hit the Transmission power line, leading to breakdowns and an interruption in electricity supply).

Figure 7 below indicates the approximate location of the identified mining operation in relation to the proposed route corridors.

**Figure 7:** Location of mining operations in relation to the various alignments (not to scale)

**Source:** Google Earth and Site Visit GPS points



An assessment of this category 2 impact was conducted through the use of the assessment criteria (outlined in section 1.3.1) to determine the significance the impact per alignment, as per table 4a below.

**Table 4a: Geographical Change Processes Category 2 Impact Assessment: Mining Operations**

	Western Alternative		Central Alternative		Eastern Alternative	
<b>PRE-MITIGATION</b>						
<b>Significance</b>	No impact	0	No impact	0	Moderate	3
<b>Spatial</b>	n/a	-	n/a	-	Isolated	1
<b>Duration</b>	n/a	-	n/a	-	Medium term	3
<b>Degree of Probability</b>	n/a	-	n/a	-	Could happen	3
<b>Degree of Certainty</b>	n/a		n/a		Possible	
<b>Risk</b>	-	n/a	-	n/a	1.98	Low
<b>Status</b>	n/a		n/a		Negative	
<b>POST-MITIGATION</b>						
<b>Significance</b>	No impact	0	No impact	0	Low	2
<b>Spatial</b>	n/a	-	n/a	-	Isolated	1
<b>Duration</b>	n/a	-	n/a	-	Medium term	3
<b>Degree of Probability</b>	n/a	-	n/a	-	Could happen	3
<b>Degree of Certainty</b>	n/a		n/a			
<b>Risk</b>	-	n/a	-	n/a	1.2	Low
<b>Status</b>	Negative to Neutral		Negative to Neutral		Negative to Neutral	
<b>MITIGATION MEASURES</b>						
<ul style="list-style-type: none"> <li>• The location of the Transmission power line should be determined in consultation with mining companies.</li> <li>• It is preferable to avoid mining operations at these plants altogether.</li> </ul>						
<b>PREFERRED ALIGNMENT</b>						
<p>The <b>eastern alignment</b> in the northern part of the study area as the open cast mining area is located far enough from the alignment. North of the Leslie Gold mine it is preferable to switch over to the <b>western alignment</b> to avoid the Leslie mine and shafts further south in the study area, as well as placing the line further away from the slimes dam.</p>						

### 3.5 Baseline Economic Profile

Economic processes relate to the way in which people make a living and the economic activities within that society. The employment status within a community gives an indication of the economic stability of such a community and also serves as an indicator of such a community's general well-being.

### 3.5.1 Employment and Economic Sectors

Table 5 below provides an overview of the employment and economic sectors of the study area in relation to South Africa as a whole, the province and the district. From this table it is clear that the study is not only characterised by a predominantly semi-skilled to skilled male population, but also a fairly high employment rate.

Close on three quarters (or 70.1%) of the working age population within the study area is formally employed. This represents an average increase of 8.5% in the employment rate in the whole study area.

Overall it would therefore appear as if the economy of the study area is growing at a steady pace. As economic industries are growing, more employment opportunities are created thereby further reducing the unemployment rate, creating sources of income which in turn leads to the creation of other opportunities such as further education, a need for housing (which in turn creates further employment opportunities, both directly and indirectly), etc.

**Table 5: Summary of Employment and Economic Sectors**

	South Africa	MP	NDM	ELM	
	2001 <sup>9</sup>	2007		2001	2007
Employed <sup>10</sup>	33.7%	40.1%	42.1%	40.2%	50.0%
Unemployed <sup>14</sup>	24.0%	20.0%	19.8%	25.0%	21.3%
Not economically active	42.3%	39.9%	38.1%	34.8%	28.7%
Employment rate <sup>11</sup>	58.4%	66.7%	68.0%	61.6%	70.1%
Predominant industry	Community services (29.1%)	Unspecified (29.0%)	Unspecified (26.1%)	Unspecified (73.8%)	Unspecified (32.6%)

### 3.5.2 Household and Personal Income

In 2001, close on a fifth to a quarter (or one in every 4-5 households) in the study area had no annual household income. A further 33.6% (or 27 621) of the households within the ELM

<sup>9</sup> Census 2001 data (2007 data not readily available)

<sup>10</sup> This is the percentage employed/unemployed of the entire working age population and should not be read as the unemployment rate, i.e. the *not economically active* population is included in this segment.

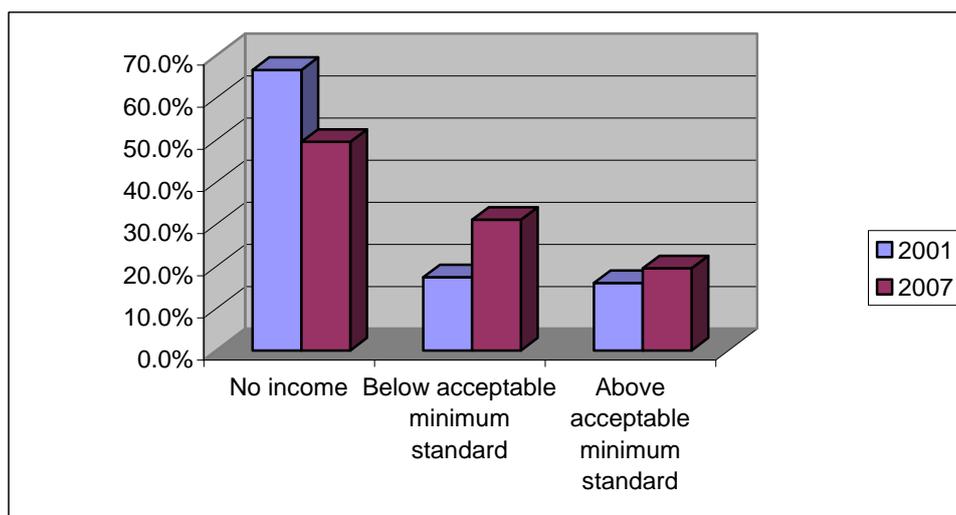
<sup>11</sup> In order to reflect a more accurate employment rate, the *not economically active* population has been excluded from this segment.

lived below the acceptable minimum standard, which is nationally defined as an annual household income of at least R20 000 per annum. In the ELM, close on half (45.6%) lived above the acceptable minimum standard (> R20 000 p.a. per household).

Unfortunately Community Survey 2007 did not include data on household incomes and therefore this report also includes an overview of personal income (which was covered in CS 2007) in an attempt to provide an overview of the baseline economic conditions of individuals in the area.

The graph below (Figure 8) provides a comparative overview of the personal income levels of individuals in the study area between 2001 and 2007. However, it should be noted that the 'no income' category also includes persons under the age of 14 (who is not regarded as people within a working age category and therefore would earn no income) as well as persons from the 'not economically active' population, who are therefore not only unemployed, but who are also not actively seeking employment and therefore also do not earn an income.

**Figure 8:** Overview of Monthly Personal Income (2001 and 2007 compared)



The number of individuals with no personal income decreased by approximately 17.1% over the 6 year period between 2001 and 2007, bearing in mind that a large segment of those with no personal income are either under the age of 14 or not economically active. The number of individuals who earn a personal monthly income below the national accepted minimum standard (defined as earning at least R1 600 per month) has increased by 13.6% between 2001 and 2007. The number of individuals who earn above the acceptable minimum standard increased only marginally by 3.5%.

From this data, it would appear as if more people entered the economic market, which is linked to the increased employment rate and the broadening of the economic sectors within the study area.

### 3.6 Economical Change Processes and Resultant Impacts

Economical change processes relate to the changes brought about to the employment and general economic profile of the area as a result of the introduction of any development. Employment creates a source of income, which in turn enables the employed individual to access services and a support mechanism for his/her family, thereby enhancing not only the individual's quality of life, but also that of his/her household.

#### 3.6.1 Expected Impacts

Table 6 below provides an overview of the expected change process as well as the expected impacts that might occur as a result of the change process taking place.

**Table 6:** Economical Change Processes

ECONOMIC CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Increase in division between rich and poor</b>	Will the development exacerbate class equalities?		X	No impact foreseen.
	Will the development enhance or enforce class inequality?		X	No impact foreseen.
<b>Enhanced reinforced economic inequities</b>	Will the development deny or enhance economic opportunities for vulnerable communities?		X	No impact foreseen.
	Will the project create different levels of economic opportunity?		X	No impact foreseen.
	Will the employment opportunities created by the development be sustainable?		X	No impact foreseen.
	Will the development change the income generating focus of the community?		X	No impact foreseen.
<b>Change in the commercial / industrial focus of the community</b>	Do residents have the required skills, life experience and contextual understanding to benefit from the proposed development?		X	No impact foreseen.
	Will a change in economic focus associated with the development have repercussions for social cohesion?		X	No impact foreseen.

ECONOMIC CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Change in employment equity of vulnerable groups</b>	Are vulnerable groups able to take advantage of changed employment opportunities associated with the development?		X	No impact foreseen.
	Will vulnerable groups have to compete with more appropriately qualified applicants from elsewhere?		X	No impact foreseen.
<b>Change in occupational opportunities</b>	Will the development lead to an increase or decrease in employment opportunities?		X	No impact foreseen.
	Will the development create different levels and types of employment?		X	No impact foreseen.
	What types of skills will the development require?			Skilled workers would be required.
<b>Land acquisition and disposal, including cost of land</b>	Will the development lead to a significant increase in the cost of land/property in the area?		X	Visibility of transmission line could affect the property value in some areas, although a decrease is expected as opposed to an increase in property value.
	Will the development result in an increase of land/property prices?		X	
	Will the increase in land/property prices exacerbate class and race inequity?		X	

### 3.6.2 Construction and Decommissioning Phase

The economical change processes that are expected during this phase of the project are as follows:

- **Compensation for servitude**

Eskom pays a once-off amount to landowners for right of way in the servitude of 55m per 400kV line. Compensation is also paid for the potential loss of livelihood as a result of the servitude. Normally compensation is calculated based on current market related land values, after which Eskom would offer 100% of the value of the land. Should the lines take up more than 50% of the land, Eskom will offer to buy the farm out (personal communication, Eskom). The value of the servitude to be negotiated is calculated by multiplying the area of the servitude required from the land owner with the valuator's unit price. The impact of financial gain should be long-term, because although a once-off amount is paid, this amount is

deemed to reflect the lifelong economic effect. However, land owners are increasingly insisting on an annual access fee, which should be revised annually.

The financial gain is seen as a positive impact. The servitude is negotiated within a corridor (of up to 500 m wide) approved by DEAT. Some modification of the proposed line alignment is possible within this approved corridor, but significant modification in the alignment will be subject to additional environmental review. Effective mitigation measures could result in a servitude which satisfies both parties.

However, the final status of the impact is dependant on the negotiation process. A transparent negotiation process that leads to a positive outcome (i.e. both parties are satisfied with the agreement) will have a positive impact. A breakdown in negotiations would lead to a negative impact in terms of a lengthy legal process that can either lead to an alternative route for the Transmission power line or the expropriation of land for the servitude. In this instance the project will be severely delayed. If there is a breakdown in the negotiation process, the potential impact would be high levels of frustration as a result of the litigation process and the resultant delay in construction, as well as the potential for a perceived economic loss for both parties.

It is furthermore difficult to determine the significance post mitigation as Eskom has no control over how a particular landowner would invest the money and therefore a post-mitigation assessment has not been conducted.

An assessment of this category 1 impact was conducted through the use of the assessment criteria (outlined in section 1.3.1) to determine the significance of the identified issues, as per table 6a below.

**Table 6a: Construction & Decommissioning Phase: Economical Change Processes Category 1 Impact Assessment**

	Significance	Spatial		Duration		Degree of Probability		Degree of Certainty		Risk		Status
<b>PRE-MITIGATION</b>												
Compensation for servitude	Moderate	3	Isolated	1	Incidental	1	Going to happen	5	Definite	1.7	Low	Positive
<b>POST MITIGATION</b>												
Compensation for servitude	-	-	-	-	-	-	-	-	-	-	-	-
<b>MITIGATION MEASURES</b>												
<ul style="list-style-type: none"> <li>• Compensation (not necessarily in the form of monetary compensation) to individuals who are residing in informal settlements within the servitude should be considered. However, this issue should be approached with caution as this might set a precedent for future projects (people might deliberately move onto the servitude for the purpose of receiving compensation).</li> <li>• The land valuator should be experienced in valuating the land in question.</li> <li>• The process should be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in “empty promises”).</li> <li>• The negotiation should be done for the whole servitude and not part of the servitude.</li> <li>• Contracts should be reviewed by an independent body.</li> <li>• Land owners should be made aware that a pre- and post evaluation of their land value is possible.</li> <li>• In the case of tribal authorities, Eskom should consider establishing a trust fund in consultation with the tribal authority (as a form of compensation) for the community that is jointly administrated by Eskom and the tribal authority. Community development projects can then be funded from the trust fund, which would aid sustainable development in the area.</li> </ul>												

### **3.6.3 Operation and Maintenance Phase**

The economical change processes that are expected during this phase of the project are as follows:

- **Property Values**

When considering the impact of a transmission power line on property values, the following must be considered:

- \* The location of the transmission power line (e.g. on the border, through the middle, or cutting a corner of a property);
- \* The location of transmission power line towers;
- \* The type of towers used;
- \* The presence of existing transmission power lines; and
- \* The presence of any visual mitigation.

In the case of the section between the Minerva substation and the Apollo converter station, the proposed transmission power line will follow an existing corridor that currently contains either 5 existing transmission power lines depending on location along the route. The corridor runs between residential property estates, but it is however, envisaged that lines will not cross properties and that there is no requirement for towers to be located on residential properties. The current proximity of transmission power lines also means that the value implications of their presence will in general already be reflected in values for residential properties in proximity to the transmission power line.

An exception may be applied to a number of properties bordering the corridor on the south as the proposed transmission line will be placed on the southern side of the corridor. This will decrease the distance between a transmission power line and adjacent properties from approximately 100-60m to approximately 60-30m, which may cause a slight decrease in property value for the bordering properties of approximately 5-10%.

An assessment of this category 2 impact was conducted through the use of the assessment criteria (outlined in section 1.3.1) to determine the significance of each of the identified issues, as per table 6b below.

**Table 6b:** Operation & Maintenance Phase: Geographical Change Processes Category 2 Impact Assessment: Property values

	Western Alternative		Central Alternative		Eastern Alternative	
<b>PRE-MITIGATION</b>						
<b>Significance</b>	Moderate	3	Moderate	3	No impact	0
<b>Spatial</b>	Isolated	1	Isolated	1	n/a	
<b>Duration</b>	Medium term	3	Medium term	3	n/a	
<b>Degree of Probability</b>	Could happen	3	Could happen	3	n/a	
<b>Degree of Certainty</b>	Possible		Possible		n/a	
<b>Risk</b>	1.62	Low	1.62	Low	-	n/a
<b>Status</b>	Negative		Negative		n/a	
<b>POST-MITIGATION</b>						
<b>Significance</b>	Low	2	Low	2	No impact	0
<b>Spatial</b>	Isolated	1	Isolated	1	n/a	
<b>Duration</b>	Medium term	3	Medium term	3	n/a	
<b>Degree of Probability</b>	Unlikely	2	Unlikely	2	n/a	
<b>Degree of Certainty</b>	Possible		Possible		n/a	
<b>Risk</b>	0.48	Very low	0.48	Very low	-	n/a
<b>Status</b>	Negative		Negative		n/a	
<b>MITIGATION MEASURES</b>						
<ul style="list-style-type: none"> <li>Implementation of visual mitigation measures as proposed in the Visual Impact Assessment.</li> </ul>						

### 3.7 Baseline Empowerment and Institutional Profile

Institutional and empowerment processes relate to the role, efficiency and operation of government sectors and other organisations within the area in terms of service delivery. It also investigates the ability of people to engage in decision-making processes to such an extent that they have an impact on the way in which decisions are made that would concern them.

### 3.7.1 Municipal Services

The years between 2001 and 2007 saw a steady decline in the delivery of municipal services to the households within the study area. The municipal infrastructure is mostly located within the urban areas of the municipal areas. Municipal infrastructure backlogs are mostly confined to the previously disadvantaged township areas, and, as could be expected, in informal settlement areas. The outlying rural areas rely almost exclusively on water and sanitation services that are below Reconstruction & Development Programme (RDP) standard. In terms of water services, RDP standard is defined as piped water either within a dwelling or within 200m of such a dwelling. Sanitation services on par or above RDP standard is defined as any waterborne sanitation services that are connected to a municipal sewerage system or a ventilated pit latrine (VIP) system.

Table 7 below provides an overview of the municipal services of the affected area in relation to the province and the district as a whole. No data could be obtained for the overall municipal service delivery in South Africa. It appears as if municipal service delivery has decreased within the ELM. The mostly likely explanation for this occurrence is that the municipal services were unable to keep up with the huge increase in the number of households, which had an average annual growth rate of 5 113 households (or 30 678 households between 2001 and 2007). Therefore, it would appear that, in general within the study area, municipal services are at a very vulnerable stage and that the municipal network might not be able to sustain additional connections to the network.

**Table 7: Overview of Municipal Service Delivery to the Affected Areas**

	South Africa	MP	NDM	ELM	
		2007		2001	2007
Energy cooking		Electricity (55.7%)	Electricity (59.6%)	Electricity (62.6%)	Electricity (56.4%)
Energy heating		Electricity (45.0%)	Electricity (49.3%)	Electricity (59.2%)	Electricity (47.1%)
Energy lighting		Electricity (82.2%)	Electricity (81.5%)	Electricity (70.3%)	Electricity (60.1%)
Refuse		Own disposal (49.6%)	Own disposal (48.1%)	Removed once a week (64.2%)	Removed once a week (56.9%)
Sanitation		RDP standard or above (55.5%)	RDP standard or above (54.9%)	RDP standard or above (74.7%)	RDP standard or above (66.2%)

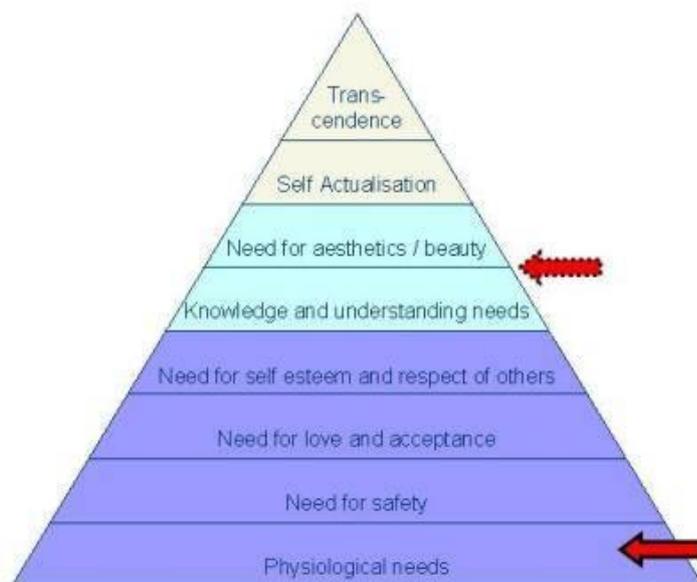
	South Africa	MP	NDM	ELM	
		2007		2001	2007
Water		RDP standard or above (91.1%)	RDP standard or above (96.6%)	RDP standard or above (94.2%)	RDP standard or above (98.6%)

### 3.7.2 Empowerment and Participation

In terms of baseline empowerment processes, the hierarchy of needs as set out by Maslow, offers an insightful backdrop in terms of people's potential level of involvement in the EIA process and the issues that might be pertinent to them in a development of this nature. Maslow argued that the type of need that a person experiences is dependent on the fulfilment of other needs. The various categories of needs are organised in a hierarchy, which indicates which level of need has to be fulfilled before the next level of need would be experienced (refer to Figure 9).

Therefore, in order to expect people to fully participate in a process that might affect their future, people would have to function on a higher level within the hierarchy of needs (the need for self esteem, characterised by knowledge and understanding needs as well as the need for an environment that is aesthetically appealing, as indicated by the dashed red arrow). This means that their basic needs had to be met first (as indicated by the solid red arrow). The flipside is that people, who live in poverty as a result of high unemployment rates, low income levels and a poor education, struggle to survive on a daily basis and are therefore more focused on their more basic needs.

**Figure 9: Maslow's Hierarchy of Needs**



Source: [www.arrod.co.uk](http://www.arrod.co.uk)

People who are more focused on their basic needs are therefore in a sense disempowered to fully participate in the process. The issue here is not that these communities are misinformed or lack information as such, but rather that these communities are ignorant about their rights and responsibilities as participants in the process. In such an instance it can very well be expected that such community members' expectation of the project mostly relates to employment opportunities. However, due to the fact such residents mostly function on a very basic needs level, they might fail to comprehend the "bigger picture" or in other words, the associated impacts (both negative and positive) that the proposed project would bring to their area. Their lack of understanding has bearing on future generations that will inhabit the area.

### **3.8 Expected Empowerment and Institutional Change Processes**

Negotiation for land is a change process on legal and empowerment level. The same applies to the stakeholders that will be involved in the public participation process. The EIA process is an opportunity for these stakeholders to give input into the process and project. However, stakeholders would have to offer up their time to become actively involved in the process and they should clearly understand their rights in terms of the process to enable them to use these rights.

Attitude formation may start during the EIA process. Attitude formation is a change process, and not an impact. Attitude formation might result in delays in project implementation, which might result in secondary impacts such as economic impacts.

### 3.8.1 Expected Impacts

Table 8 below provides an overview of the expected change process as well as the expected impacts that might occur as a result of the change process taking place.

**Table 8: Institutional & Empowerment Change Processes**

INSTITUTIONAL AND EMPOWERMENT CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Change in / disruption of power relationships</b>	Will the development impact on the levels of power, opportunity and access of individuals or sections of the community, e.g. during the negotiation process?	X		A breakdown in the negotiation process could severely delay the project and result in an economic impact on both the landowner as well as on Eskom.
	Is the development being used for the political gain of a section of the community, and what are the implications for the larger social environment?		X	No impact foreseen.
<b>Exclusivity</b>	Will the development contribute to the culture of exclusivity?		X	No impact foreseen.
<b>Inequality</b>	Will the development increase unequal access to opportunities or resources?		X	No impact foreseen.
<b>Change in community infrastructure</b>	Will the development change any aspect of community infrastructure, such as crèches, clinics, schools, churches, formal or informal sports fields, open areas, dumping grounds etc?		X	No impact foreseen.
	Will the development create increased demand for basic services, e.g. water, electricity, sewerage, roads?		X	No impact foreseen.
	Will the existing access of the community to basic services be impacted by the development?		X	No impact foreseen.
<b>Change in housing needs / demands</b>	Will the development create a housing need, e.g. due to the in-migration of construction workers?		X	No impact foreseen.
	Has the need for more housing been addressed by the			Not applicable.

INSTITUTIONAL AND EMPOWERMENT CHANGE PROCESSES			
Expected Change Process	Yes	No	Expected Impact
development and or the authorities?			

### 3.8.2 Construction & Decommissioning Phases

The institutional and empowerment change processes that are expected during this phase of the project are as follows:

- **Negotiation process**

The negotiation process is undertaken directly by Eskom and is independent of the EIA process. Eskom should determine in consultation with the landowners who should form part of this process and then ensure that all the relevant parties are present. Important points relating to the negotiation process were discussed in Section 2.4.

The results of a study conducted by MasterQ Research (2007) identified the differences amongst landowners in negotiation skills and knowledge as one of the weaknesses in the negotiation process. In addition, it seemed that the perception amongst certain stakeholders who participated in the study was that landowners with more money had more negotiating power. For example, during the negotiations for the Matimba-Witkop Nr. 2 400kV transmission power line, one landowner managed the moving of an existing line to the edge of his land before he agreed to the construction of the second line. However, this landowner was held responsible for the financial implications of the moving of the line.

If negotiations are not handled with the necessary sensitivity the impact of this process can be severely negative, i.e. a deadlock in negotiations resulting in an indefinite delay of the project. It would normally be preferable that the negotiation process begins after the EIA has been completed. At this stage there is greater confidence in the appropriateness of the site, and it would be supported by environmental authorisation. Although Eskom has the right to engage with any landowner at any time, they do so at risk if environmental authorisation has not been awarded.

An assessment of this category 1 impact was conducted through the use of the assessment criteria (outlined in section 1.3.1) to determine the significance of the identified issue, as per table 8a below.

**Table 8a: Construction & Decommissioning Phase: Institutional & Empowerment Change Processes Category 1 Impact Assessment**

	Significance		Spatial		Duration		Degree of Probability		Degree of Certainty		Risk	Status
<b>PRE-MITIGATION</b>												
Negotiation process	High	4	Study area	2	Short term	2	Going happen	5	Possible	2.7	Moderate	Depends on the outcome of the negotiation process
<b>POST MITIGATION</b>												
Negotiation process	High	4	Study area	2	Short term	2	Going happen	5	Possible	2.7	Moderate	Positive
<b>MITIGATION MEASURES</b>												
<p><b>Negotiation Process:</b></p> <ul style="list-style-type: none"> <li>• The implementation of a fair and transparent negotiation process, as discussed under Section 2.4.</li> <li>• Negotiations in should be approached with the necessary cultural sensitivity.</li> <li>• Eskom should consider making use of an approved interpreter during the negotiation process to ensure that there are no misunderstandings as a result of language barriers.</li> </ul>												

### 3.8.3 Operation & Maintenance Phase

No impacts are foreseen during this phase of the project.

### 3.9 Baseline Socio-Cultural Processes

Socio-cultural processes relate to the way in which humans behave, interact and relate to each other and their environment, as well as the belief and value systems which guide these interactions.

### 3.10 Expected Social-Cultural Change Processes and Resultant Impacts

Socio-cultural change processes that are associated with the construction and operation of the proposed project include changes to aspects such as health and safety and sense of place. In a social sense, it should be noted that the concept of ‘health’ is not only limited to physical health (i.e. the absence of ailments or illness), but also includes mental and social health. The expected changes that can occur in relation to health and safety aspects can be as a result of the presence of the proposed transmission power line and its associated infrastructure during operation, as well as the presence of construction workers and/or job seekers during construction.

The significance of the impacts of socio-cultural changes is difficult to determine on a prospective basis and are dependent on the demographic profile of, for example, construction workers and whether or not such differences affected local residents. For example, if construction workers were from a different cultural background than locals, conflict can be expected if such different cultural backgrounds are not respected. Conflict as a result of cultural differences or community disintegration as a result of the acceptance of construction workers’ culture might occur – should the demographic profile of these construction workers be different, and should it matter to the communities involved.

#### 3.10.1 Expected Impacts

Table 9 below provides an overview of the expected change process as well as the expected impacts that might occur as a result of the change process taking place.

**Table 9:** Socio-Cultural Change Processes

SOCIO-CULTURAL CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
<b>Disruption of social networks</b>	Will the development impact on existing social networks?		X	No impact foreseen.

<b>SOCIO-CULTURAL CHANGE PROCESSES</b>				
<b>Expected Change Process</b>		<b>Yes</b>	<b>No</b>	<b>Expected Impact</b>
<b>Disruption in daily living and movement patterns</b>	Will the development change the lifestyle of residents?		X	No impact foreseen.
	Will the development impact on access to facilities and resources, such as schools, hospitals, fields, forests, etc?		X	No impact foreseen.
	Will it impact on movement patterns, such as pedestrians crossing roads?		X	Impact of construction activities on movement patterns of local communities, potentially impacting on safety and ease of movement.
	Will it divide communities physically (e.g. through the building of a highway)?		X	No impact foreseen.
<b>Dissimilarity in social practices</b>	Do new residents have dissimilar social practices to current residents?		X	No impact foreseen.
	Do the new residents have different values, religious practices, social standard, etc?		X	No impact foreseen.
<b>Alteration in family structure</b>	Could the development threaten family cohesiveness?		X	Socially acceptable integration, including the risk of spreading STIs and HIV/AIDS with an impact on health. The spread of STI and HIV is a matter of great concern, also in view of the light that construction workers move out of the area into another area where the spread of these STI and HIV continues. Apart from the obvious health implications, HIV infection in particular also has an economic impact.
	Could it impact on immediate or extended family networks?		X	
	Could it impact on the traditional roles played by members of the family?		X	
<b>Conflict</b>	Will the development lead to conflict between sectors of the social environment?		X	If social integration between newcomers and residents is hindered, it can lead to conflict, which in turn delays the construction process and has economic implications for the developer.

SOCIO-CULTURAL CHANGE PROCESSES				
Expected Change Process		Yes	No	Expected Impact
	Is there conflict between the developer and the public?		X	No impact foreseen.
	Is this conflict being addressed?			Not applicable.
<b>Safety and crime impacts</b>	Will the development impact on existing crime and safety patterns?		X	Not applicable.
<b>Change in sense of place</b>	Will the development impact on people's "sense of place", e.g. through the large scale development of a rural community?	X		The presence of a transmission power line has a visual impact, changing the landscape from unspoilt to 'spoilt'.
	Will the change "in sense of place" impact on people's relationship to the environment?	X		
<b>Implications for social history</b>	Does the development have any implications for the social history of affected communities?		X	No impact foreseen.
	Will the development further marginalise communities that have been relocated during <i>apartheid</i> ?		X	No impact foreseen.
	Will the development affect processes, structures or patterns that are valued as part of the social history of an area?		X	No impact foreseen.
<b>Change in leisure opportunities</b>	Will the development impact on access to existing leisure opportunities?	X		Linked to 'sense of place'.

### 3.10.2 Construction & Decommissioning Phases

No impacts are foreseen during this phase of the project.

### 3.10.3 Operation and Maintenance Phase

The socio-cultural change processes that are expected during this phase of the project are as follows:

- **Sense of place**

Much of what is valuable in a culture is embedded in place, which cannot be measured in monetary terms. It is because of a sense of place and belonging that some people loath to be moved from their dwelling place, despite the fact that they will be compensated for the inconvenience and impact on their lives.

The potential impact on socio-cultural behaviour and the related perception of environmental changes could either have a positive or a negative impact on sense of place (i.e. peace of mind or frustration/anger). It could be viewed as a positive impact if people perceive the project as a means of job creation, which is true in the case of the tribal authorities, and infrastructural and/or economic development, which is not intrusive on their lives and do not cause them immediate danger. Potential negative impacts include the visual impact and the resultant intrusion on sense of place.

Research on the psychological experience of sense of place suggests that people rapidly discount a landscape as soon as the first scar occurs, rather like a stain ruining a favourite garment (Petrich 1993). Thereafter, any additional impacts on the landscape have a correspondingly smaller effect. Hence, the aesthetic impact of placing a transmission line in a landscape that already bears the marks of development would be less than that of placing it in a relatively unspoilt environment. People overwhelmingly prefer "nature scenes" to urban and built environments, according to research. Zadik (1985) explains "people seem to respond to environments as natural if the areas are predominantly vegetation and do not contain human artefacts such as roads or buildings (Relf 1992)."

Steven Kaplan (1992) attributes the restorative value of participation with nature, particularly wilderness experiences, to the ability to fulfil several criteria: Being away, Extent, Fascination, and Compatibility which is established by an environment that is conducive to meeting personal goals; that is, in a compatible environment, what you want to do and are inclined to attempt are needed and feasible.

In some instances the potential presence of the Transmission power lines might affect residents' sense of place. In the past they might have felt safe and secure in the area and therefore stayed in the area for those specific reasons. As the proposed Transmission power lines might impact on people's *perception* of safety, these people might now feel unsafe in the area knowing that the lines are located within the area. Furthermore, the visibility of the transmission power line might impact on people's quality of life in terms of the aesthetics of the area that they have grown accustomed to.

It is important to note that sense of place has been assessed from a social point of view, which relates to people's perception of the project in relation to the area. Due to the fact that large segments of the affected area live in poverty, have fairly low educational levels coupled with unemployment, it is expected that their expectation of the project would mostly relate to positive impacts (the expectation of being employed), whereas the private landowners (farmers) are more aware of the potential negative impacts that the installation might have

on their current and future land use. Private landowners have described the area as ‘pristine’ and ‘unique’ and therefore a change in the environment brought about by the introduction of the proposed project might influence this perception. People who are, for example, unemployed and living in poverty have different needs than preserving the area or the environment and are therefore less likely to oppose the proposed project as they believe it will bring about change in the area in terms of employment and upliftment.

An assessment of this category 2 impact was conducted through the use of the assessment criteria (outlined in section 1.3.1) to determine the significance the impact per alignment, as per table 9a below.

**Table 9a: Operation & Maintenance Phase: Socio-Cultural Change Processes Category 2 Impact Assessment: Sense of Place**

	Western Alternative		Central Alternative		Eastern Alternative	
<b>PRE-MITIGATION</b>						
<b>Significance</b>	High	4	Moderate	3	Low	2
<b>Spatial</b>	Study area	2	Study area	2	Study area	2
<b>Duration</b>	Long term	3	Long term	3	Long term	3
<b>Degree of Probability</b>	Very likely	4	Very likely	4	Could happen	3
<b>Degree of Certainty</b>	Probable		Probable		Possible	
<b>Risk</b>	<b>2.4</b>	<b>Moderate</b>	<b>2.16</b>	<b>Moderate</b>	<b>1.38</b>	<b>Low</b>
<b>Status</b>	Negative		Negative		Negative	
<b>POST-MITIGATION</b>						
<b>Significance</b>	Moderate	3	Low	2	Very low	1
<b>Spatial</b>	Study area	2	Study area	2	Study area	2
<b>Duration</b>	Long term	3	Long term	3	Long term	3
<b>Degree of Probability</b>	Could happen	3	Could happen	3	Unlikely	2
<b>Degree of Certainty</b>	Probable		Probable		Possible	
<b>Risk</b>	<b>1.62</b>	<b>Low</b>	<b>1.38</b>	<b>Low</b>	<b>0.48</b>	<b>Very low</b>
<b>Status</b>	Negative		Negative		Negative to Neutral	
<b>MITIGATION MEASURES</b>						
<ul style="list-style-type: none"> <li>Due consideration should be given to any visual screening mitigation measures identified and suggested by the Visual Impact Assessment.</li> </ul>						
<b>PREFERRED ALIGNMENT</b>						

Western Alternative	Central Alternative	Eastern Alternative
---------------------	---------------------	---------------------

The <b>eastern alternative</b> , followed by the <b>central alternative</b> .
---

## 4. CONCLUSIONS

### 4.1 Summary

The change processes are grouped per project phase in Table 10a (expected category 1 impacts) and in Table 10b (expected category 2 impacts) with an indication of the significance of these potential impacts before and after mitigation. The significance of potential category 1 impacts is then grouped per change process in Table 11a, while Table 11b reflects a summary of the potential category 2 impacts per change process.

*Table 10a: Summary of Category 1 Impacts per Project Phase*

CHANGE PROCESS	ASSESSMENT AREA	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
<b>CONSTRUCTION &amp; DECOMMISSIONING</b>			
<b>Demographic</b>	No impacts foreseen	n/a	n/a
<b>Geographic</b>	No impacts foreseen	n/a	n/a
<b>Economic</b>	Compensation for servitude	Low +	n/a
<b>Institutional and Empowerment</b>	Negotiation process	Moderate	Moderate +
<b>Socio-Cultural</b>	No impacts foreseen	n/a	n/a
<b>OPERATION &amp; MAINTENANCE</b>			
<b>Demographic</b>	No impacts foreseen	n/a	n/a
<b>Geographic</b>	No impacts foreseen	n/a	n/a
<b>Economic</b>	No impacts foreseen	n/a	n/a
<b>Institutional and Empowerment</b>	No impacts foreseen	n/a	n/a
<b>Socio-Cultural</b>	No impacts foreseen	n/a	n/a

**Table 10b: Summary of Category 2 Impacts per Project Phase**

Change Process	Assessment Area	Western Alternative		Central Alternative		Eastern Alternative	
<b>CONSTRUCTION &amp; DECOMMISSIONING</b>							
<b>Demographical</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Geographical</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Economical</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Empowerment and Institutional</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	Na
<b>Socio-Cultural</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>OPERATION &amp; MAINTENANCE</b>							
<b>Demographical</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Geographical</b>	Mining operations	No impact	No impact	No impact	No impact	Low -	Low – to ±
<b>Economical</b>	Property values	Low -	Very low -	Low -	Very low -	No impact	No impact
<b>Empowerment and Institutional</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Socio-Cultural</b>	Sense of place	Moderate -	Low -	Moderate -	Low -	Low -	Very low – to ±

The construction and decommissioning phase of the proposed project is characterised by a number of positive impacts. This is mainly due to the nature of the negotiation and economical activities that take place during these phases. The operation and maintenance phase are characterised by a number of negative impacts, which mostly relates to the visibility and the presence of the transmission power line, notably where corridors cross the Witbank Dam.

**Table 11a: Summary of Category 1 Impacts per Change Process**

<b>CHANGE PROCESS</b>	<b>ASSESSMENT AREA</b>	<b>SIGNIFICANCE (pre-mitigation)</b>	<b>SIGNIFICANCE (post-mitigation)</b>
<b>DEMOGRAPHICAL</b>			
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a
<b>GEOGRAPHICAL</b>			
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a
<b>ECONOMICAL</b>			
<b>Construction &amp; De-commissioning</b>	Compensation for servitude	Low +	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a
<b>EMPOWERMENT &amp; INSTITUTIONAL</b>			
<b>Construction &amp; De-commissioning</b>	Negotiation process	Moderate	Moderate +
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a
<b>SOCIO-CULTURAL</b>			
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	Low -	Very low -

**Table 11b: Summary of Category 2 Impacts per Change Process**

Change Process	Assessment Area	Western Alternative		Eastern Alternative		Western Sub-Alternative	
<b>DEMOGRAPHICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>GEOGRAPHICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Mining operations	No impact	No impact	No impact	No impact	Low -	Low – to ±
<b>ECONOMICAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Property values	Low -	Very low -	Low -	Very low -	No impact	No impact
<b>EMPOWERMENT &amp; INSTITUTIONAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	Na
<b>Operation &amp; Maintenance</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a

<b>Change Process</b>	<b>Assessment Area</b>	<b>Western Alternative</b>		<b>Eastern Alternative</b>		<b>Western Sub-Alternative</b>	
<b>SOCIO-CULTURAL</b>							
<b>Construction &amp; De-commissioning</b>	No impacts foreseen	n/a	n/a	n/a	n/a	n/a	n/a
<b>Operation &amp; Maintenance</b>	Sense of place	Low -	Low -	Moderate -	Low -	Moderate -	Low -

The geographical, economical and socio-cultural processes all have a number of negative impacts. However all of these impacts can be mitigated successfully if effectively managed. Economic impacts as a result of the project are for the most part negative in nature, which is mainly due to the economic investment and development that will take place in the community as a result of the project.

Operational impacts are expected to last over the longer term and therefore would have a prolonged effect on especially the geographical environment in terms of the presence of the Transmission power lines in the area. People are more inclined to get “used” to the infrastructure in their area if servitude and line maintenance are applied effectively and with due diligence. The regular monitoring and evaluation of the Transmission power lines as a whole would also ensure that corrective measures can be taken immediately to prevent adverse effects either on the infrastructure itself, or on the local area.

## 4.2 Preferred Route Corridor

To come up with a preferred corridor, a comparison among the alternative corridor alignments was conducted by assessing all of the category 2 impacts identified with a certain change process. A summary of the outcome of this brief assessment is as per table 12 below, where:

	Sensitive area, not recommended from a social perspective (high to very high significance impact rating prior to mitigation).
	Acceptable area neither ideal nor flawed from a social perspective (moderate significance impact rating prior to mitigation).
	Ideal area, from a social perspective (low to very low significance impact rating prior to mitigation).

*Please note that a ‘red site’ does not constitute a fatal flaw, but does however imply that careful consideration should be given to the development and implementation of mitigation measures in the event that such a site is selected.*

Also note that category 1 impacts have not been included in this table, as it is believed that these impacts would occur regardless of which site is selected in the end.

**Table 12:** Summary of Assessments (category 2 impacts)

Process	Change Process	Western	Central	Eastern
<b>Demographical</b>	No category 2 impacts	-	-	-
<b>Geographical</b>	Mining operations	0	0	1.98
<b>Economical</b>	Property values	1.62	1.62	0

Process	Change Process	Western	Central	Eastern
<b>Institutional &amp; Empowerment</b>	No category 2 impacts	-	-	-
<b>Socio-Cultural</b>	Sense of place	2.4	2.16	1.38
<b>TOTAL</b>		<b>4.02</b>	<b>3.78</b>	<b>3.36</b>

Based on the comparison of category 2 impacts prior to mitigation, overall the **eastern alternative** emerged as the preferred route corridor from a social perspective. This is based on the fact that the potential impacts as a result of the expected change process taking place, significantly decreases as outlined below:

- **Mining operations:** The eastern alternative pass in close proximity to open cast mining area. If this alternative is chosen as the preferred alignment, it is believed that some realignment would be required to bypass the open cast mining area to ensure the safe operation of both the transmission power lines as well as that of the mining operation itself.
- **Sense of place:** The area surrounding the western and central alternatives is still quite pristine and unspoilt, whereas the area surrounding the eastern alternative is regarded as 'spoilt' due to the presence of the mining operation and other industries such as the Duvha power station.

### 4.3 Recommendations

Based on the findings of this report, it can be concluded that the social environment in general pose no fatal flaws to the development of the proposed bypass transmission power lines known as Bravo 3, under the condition that the identified mitigation measures in this document and as recommended for inclusion in the EMP, are implemented and adhered to, particularly where construction activities either takes place in close proximity to or passes through residential areas that could affect the quality of live of these households in terms of noise, dust, safety and security.

This recommendation was based on the specialist's:

- Understanding of the proposed project, including the alternative route alignments and the nature and timeframe of the proposed activities;
- Assessment of the affected communities, settlements and institutions in terms of:
  - \* Demographic processes: the number and composition of people;
  - \* Geographical processes: land use patterns – including tourism;

- \* Economic processes: the way in which people make a living and the economic activities in society – including tourism;
  - \* Institutional and Empowerment processes: the ability of people to be involved and influence decision making processes; and the role, efficiency and operation of governments and other organisations; and
  - \* Socio-cultural processes: the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions, including physical and mental health processes.
- Assessment of potential change processes that might occur as a result of the project.

## **5. ENVIRONMENTAL MANAGEMENT PLAN: SOCIAL REQUIREMENTS**

From a social perspective, it is recommended that the following mitigation measures be included in the EMP.

### **5.1 Geographical Change Processes**

#### **5.1.1 Mining operations**

- The location of the Transmission power line should be determined in consultation with mining companies.
- It is preferable to avoid mining operations altogether.

### **5.2 Economical Change Processes**

#### **5.2.1 Compensation for servitude**

- Compensation (not necessarily in the form of monetary compensation) to individuals who are residing in informal settlements within the servitude should be considered. However, this issue should be approached with caution as this might set a precedent for future projects (people might deliberately move onto the servitude for the purpose of receiving compensation).
- The land valuator should be experienced in valuating the land in question.
- The process should be conducted with the necessary respect, and the negotiator should be transparent about the process and expectations (do not engage in “empty promises”).
- The negotiation should be done for the whole servitude and not part of the servitude.
- Contracts should be reviewed by an independent body.
- Land owners should be made aware that a pre- and post evaluation of their land value is possible.

#### **5.2.2 Property values**

- Implementation of visual mitigation measures as proposed in the Visual Impact Assessment.

### **5.3 Empowerment and Institutional Change Processes**

#### **5.3.1 *Negotiation process***

- The implementation of a fair and transparent negotiation process, as discussed under Section 2.4.
- Negotiations in should be approached with the necessary cultural sensitivity.
- Eskom should consider making use of an approved interpreter during the negotiation process to ensure that there are no misunderstandings as a result of language barriers.

### **5.4 Socio-Cultural Change Processes**

#### **5.4.1 *Sense of Place***

- Due consideration should be given to any visual screening mitigation measures identified and suggested by the Visual Impact Assessment.

## **6. SOURCES**

### **6.1 Project Documentation**

- Environmental Impact Assessment (EIA) for the proposed Eskom Bravo Integration Project in Gauteng and Mpumalanga (April 2008). Background Information Document: First documents for comments.
- Environmental Impact Assessment for the proposed Bravo Integration Project in Gauteng and Mpumalanga. Undated. Draft Issues and Responses Report.
- Project location map
- Urban-Econ Development Consultants (2006). Socio-Economic Impact Assessment of the proposed Eskom power station in the Witbank Geographical Area. Final Report.
- Zitholele Consulting (2008). Bravo Integration Project – Bravo 5 Construction of one 400 kV bypass power line to bypass the Duvha power station. Draft Scoping Report.

### **6.2 Municipal Documentation**

- Emalahleni Local Municipality (2008). Integrated Development Plan.

### **6.3 Other Documentation**

- Byker, N. (undated). HIV/AIDS in the workplace: An information guide for managerial staff. Unpublished training manual.
- De Jong, R.G. (1990). Community response to noise: a review of recent developments. In: Environmental International. Volume 16: 515-522.
- Evans, M.R. and H. Malone. 1992. People and plants: A case study in the hotel industry. In: D. Relf (ed.). The role of horticulture in human well-being and social development: A national symposium. Timber Press: Portland.
- Griffiths, I.D. (1983). Community response to noise. In: Rossi, G. (ed). Proceedings of the fourth international congress on noise as a public health problem.
- MasterQ Research (2007). Post hoc study: social impacts in constructing high voltage transmission power lines.
- Petrich, C.H. (1993). Science and the inherently subjective: The evolution of aesthetic assessment since NEPA. In Hildebrand, S.G & Cannon, J.B (Eds). Environmental Analysis: The NEPA Experience (pp. 294-273).

- Pretorius (2006). Electric and magnetic field from Overhead Power Lines. A summary of technical and biological aspects. Final Report. Empetus Close Corporation.
- Slootweg R, Vanclay F, van Schooten M. Function evaluation as a framework for the integration of social and environmental impact assessment. Impact Assess Project Appraisal 2001; 19(1):19–28.
- Snyman, R. (2007). Untitled research document on pipeline safety, commissioned by MasterQ Research.
- Statistics South Africa. Community Survey 2007: Key Municipal Data. Report No: 03-01-22 (2007)
- Vanclay, F. 2002. Environmental Impact Assessment Review 22:183–211
- Zadik, M.H. (1985). Social perspectives in horticulture. Proceedings of the Longwood graduate program seminars 17:36-41. Longwood Gardens, PA.

#### **6.4 Websites**

- Community Survey 2007 Interactive data  
[http://www.statssa.gov.za/community\\_new/content.asp?link=interactivedata.asp](http://www.statssa.gov.za/community_new/content.asp?link=interactivedata.asp)
- Municipal Demarcation Board. ([www.demarcation.org.za](http://www.demarcation.org.za))
- [www.arrod.co.uk](http://www.arrod.co.uk).
- [www.greatriverenergy.com/community/power\\_line\\_safety.html](http://www.greatriverenergy.com/community/power_line_safety.html).
- [www.powerlinefacts.com](http://www.powerlinefacts.com)
- [www.soil.ncsu.edu/publications/BMPs/glossary.html](http://www.soil.ncsu.edu/publications/BMPs/glossary.html).
- [www.wikipedia.org/wiki/Land\\_use.html](http://www.wikipedia.org/wiki/Land_use.html).