PROPOSED MOKOPANE INTEGRATION PROJECT

SOCIAL IMPACT ASSESSMENT
As part of the
ENVIRONMENTAL IMPACT ASSESMENT PROCESS

SECOND DRAFT SCOPING REPORT
TRANSMISSION POWER LINE CORRIDORS,
SUBSTATION SITES AND TURN-IN LINES

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Prepared by:
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EXPERIENCE RECORD

This report was compiled by **Ms Anita Bron** and **Ms Nonka Byker**, with an economic review by **Mr Raoul de Villers**, all from ***MasterQ Research***.

Ms Anita Bron – *MA (Research Psychology), MA (Social Impact Assessment – in process), BA Hons (Psychology), BA (Psychology, Criminology and Penology)*; a social impact assessment specialist with 7 year experience. Ms Bron specialises in social and market related research studies, as well as monitoring and evaluation processes. She has extensive experience in the social assessment of linear developments, such as transmission power lines. As a social specialist, her main duties include the primary as well as secondary collection of data, analysing and processing such data and based on the findings of such research, conduct an assessment of expected social impacts within a range of change processes. Her experience within the social development realm enables her to conduct informed assessments of potential impacts and based on the results of such assessments; provide input in terms of mitigation measures to be included in Environmental Management Plans. Ms Bron is a member of the South African Monitoring and Evaluation Association and the IAIA. She was a guest lecturer at the Universities of Johannesburg and Witwatersrand.

Ms Nonka Byker – *B.Psych (Adult Mental Health);* 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 such a baseline 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 IAIA.

Mr Raoul de Villiers (*M. Com, M. Econ) is* a specialist in the manner in which large project based work is planned, with a special focus on determining the business and economic viability of projects. He is also is an experienced Project Manager and has assisted large corporations and government departments with the execution of capacity building, restructuring and systems development projects. He has had a strong strategic focus, being involved in projects that have an organisation wide or industry wide impact. Mr de Villiers is a member of the IAIA.

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 socio-economic 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

This second Socio-economic Impact Assessment (SEIA) Draft Scoping Report details the results of the Scoping Phase of the Socio-economic Impact Assessment (SEIA) that is conducted by MasterQ Research for the proposed Mokopane Integration Project Environmental Impact Assessment process that is being conducted by Savannah Environmental. The proposed Mokopane Integration Project includes the following components:

- The construction and operation of a new 400/132kV substation near Mokopane;
- The integration of this substation into the transmission network by looping one of the existing Matimba-Witkop 400kV transmission power lines in and out the substation (i.e. two transmission power lines in parallel over a distance of approximately 10km);
- The construction and operation of a new 765kV transmission power line between the proposed Delta substation (near the Medupi Power Station) and the proposed Mokopane substation, covering a distance of approximately 150km;
- The construction and operation of a new 765kV transmission power line between the proposed Mokopane substation and the existing Witkop substation, covering a distance of approximately 60km;
- The construction and operation of a new 765kV transmission power line between the proposed Delta substation and the existing Witkop substation, covering a distance of approximately 200km; and
- The associated infrastructure, such as access roads, communication tower, etc., to integrate the new substation into the transmission grid and also to accommodate the new transmission power lines at the existing substations through, for example, the construction of new feeder bays at these substations.

Initially, four (4) possible route corridors were identified for the proposed 765kV transmission power line from the Medupi power station to the proposed Mokopane substation, not considering a corridor between the proposed Delta substation and the Medupi power station. A further three (3) possible route corridors from the proposed Mokopane substation to the existing Witkop substation were considered.

A site for the proposed Delta substation was since approved, and a route corridor between the Delta substation and the Medupi power station had to be assessed as part of the Mokopane Integration Project. Therefore, the first Draft Scoping Report had to be revised. Eskom used this opportunity to revise the proposed corridors between the Medupi power station and the proposed Mokopane substation, taking into account the results of the initial scoping exercise.

This second Draft Socio-Economic Scoping Report therefore considers the proposed corridor for a 765kV transmission power line between the Delta substation and the Medupi power station, as well as changes to the corridors between the Medupi power station and proposed Mokopane substation. This report also considers the substation sites. A total of four (4) possible substation sites have been identified for the location of the new substation in the Mokopane area.

The overall objective of the SEIA's Scoping Phase was to identify a preferred corridor, a preferred substation site and fatal flaws, by identifying issues and concerns associated with the proposed project within the socio-economic realm. A number of primary research objectives were derived from the overall objective:

- Identify the manner in which the proposed project might affect the social systems, land use activities and tourism activities in the study area, by describing and assessing the current baseline (status quo) conditions as well as expected future changes without project implementation, and with project implementation.
- The above-mentioned was to be considered in light of the following change process themes:
  - **Geographical processes**: land use patterns, including amongst others:
    - Settlement patterns and development;
    - Current and future agricultural and mining activities; and
    - Current and future developments in tourism.
  - **Demographic processes**: the number and composition of people, including temporary visitors;
  - **Economic processes**: the way in which people make a living and the economic activities in society;
  - **Empowerment, institutional and legal processes**: the ability of local government to supply and maintain the necessary services, and the ability of people to participate and have an influence on decision-making; and
  - **Socio-cultural processes**: processes that affect the culture of a society.
- Identify information gaps that would have to be addressed during the EIA Phase;
- Describe the studies that would have to be conducted during the Impact Assessment Phase to address the identified information gaps and how these potential impacts would be assessed.

The assessment generated certain principles for corridor selection. **Principles** give an indication of a course of action that ought to be taken. **Mitigation measures** are statements which provide advice or direction to ensure that whatever course of action is decided upon, the likelihood of negative impacts are reduced, and the potential positive impacts are enhanced.

Primary and secondary data sources were used to fulfil the objectives of the study. **Primary data** collection methods during the Scoping Phase involved a field trip by motor vehicle on 10 and 12 June 2008, and a fly over on 11 June 2008.

A GPS (Geographic Positioning System) was used to record waypoints of structures and activities relevant to the SEIA. Supplementary to the primary data, **secondary data** collection methods included the perusal of the following documentation:

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

Geographical Change Processes

Development patterns

A power line may impact on the development patterns in the area. **Movement** across and in a servitude is not prohibited, but permanent structures are not allowed in the servitude of a power line, which is 80 m for a 765kV transmission power line. Once a power line is operational, development may occur towards and into the servitude despite the fact that structures in a servitude are prohibited. Because **movement** across a servitude is not prohibited, it is not likely that the physical division caused by a servitude will significantly change movement patterns and impact on the maintenance of relationships. Where roads are constructed for access to the servitude, movement patterns may be affected.

Where structures, such as dwellings, fall in the servitude, these dwellings will have to be demolished and the inhabitants will be displaced and **relocated**. The displacement and **relocation** of people may impact on people on a psychological level. The significance of impacts of relocation on a person depends on the level of attachment to a place, which in turn is informed by variables such as age, number of years spent in that particular area, personality, and reasons for living in that specific area.

The main social concerns which arise when considering the presence of a transmission power line close to human settlement are health and safety aspects. Potential risks are related to Electro and Magnetic Fields (EMF), electrocution, fire and collapse. A line could cause fatal/traumatic accidents because of collapse of a tower and/or lines which in turn may be caused by mechanical failure, fire and mining activities. Fire can be caused by an electrical malfunction or human error.

In light of potential health and safety impacts and the potential impacts of displacement, the selection of preferred corridors and site was guided by the following principles:

Principles:
Avoid displacement of people.
Avoid settlements and dwellings.
Avoid interference with current and expected/planned future development.

Considering these principles, the following conclusions were drawn:

- Corridor 2 will potentially impact the highest number of households (relocation), followed by corridors 3 and then 1.
- Corridor 2 will potentially affect the highest number of settlements' potential future development.
- Corridors 1 and 2 will affect planned future developments between Maropong and Onverwacht.
- Corridors 1 will affect planned future developments for Lephalale town.
- Corridor 7 will not impact on any developments.

To avoid potential negative impacts on health and safety and of displacement of people, the preferred corridors were corridors 3 and 4. Although corridor 3 would potentially affect a number of households, this corridor would also potentially affect the lowest number of settlements' potential future development, and would have the least effect on Lephalale town's spatial development framework.

Considering the potential affect on settlement patterns and development (current and future), the following emerges:

- In terms of access roads, there is no preferred site.
- Site 3 is closest to settlements, followed by sites 1 and 2. In terms of potential health and safety impacts, site 4 is preferred.
- Transmission power line corridors not following the existing Matimba-Witkop transmission power lines and entering and exiting sites 1 and 2 will potentially affect more settlements.
- Considering proposed transmission power lines going to sites 3 and 4, it is possible to avoid settlements and not affect their development.

To avoid potential negative impacts on health and safety and settlements developments, the preferred site is site 4.

<u>Agricultural Activities</u>

Crop, cattle and game farming take place in the area. Selecting a preferred corridor for new power lines considered the potential impacts of the lines on these land uses.

Cultivated land – crops

- Land for cultivation is lost temporarily during the construction process of a transmission power line and in some instances more land for cultivation might be lost as a result of road construction to access the servitude.
- It is possible to cultivate land around transmission power line towers, although it does complicate the cultivation process, e.g. ploughing around pylons and anchor lines.
- Centre pivot irrigation is compatible with transmission power lines as long as certain basic precautions are taken.
- Crop spraying by plane becomes problematic and dangerous where power lines are in the vicinity.
- The Electric and Magnetic fields seem to interfere with GPS equipment and other advanced electronic equipment when these are used in the servitude area.
- Land for cultivation might be lost permanently as a result of access roads for maintenance purposes.

Grazing land – cattle and game

- Land is lost temporarily during the construction process and in some instances more land for grazing and browsing may be lost as a result of road construction to access the servitude.
- The capturing of game to allow for construction activities to take place: stresses game, is time consuming, is not without risk. Hunting activities will have to be co-ordinated to ensure the safety of hunters and workers.
- It may happen that construction and maintenance teams leave gates open, don't follow access roads, cut through fences and hunt game. The effect could be that less land is available for cultivation and grazing, the cross breeding of cattle could occur, game/cattle may be lost, and erosion is hastened.
- Transmission power lines traversing grazing land pose fewer problems compared to cultivated land for crops, as cattle and game move around the pylons. The likelihood of animals becoming stuck in pylons is slight, e.g. an animal putting its head through a gap in the pylon and getting stuck.
- Land is lost temporarily during the construction process and some land for grazing and browsing may be lost permanently as a result of access roads to towers and the line for maintenance purposes.
- Trees more than 4 meters in height are not allowed in the servitude. The loss of trees improves grazing for grazers, but reduces grazing opportunities for browsers.
- Apart from the loss of grazing land, game capturing by helicopter/aircraft becomes difficult to execute in the vicinity of a power line. The helicopters fly low, and could collide with the line when herding game if these lines are not clearly marked. Should pilots fly higher to avoid the line, they may not be able to effectively herd the game. As a result of ineffective herding, game could collide with fences, and be injured.
- Lines in close proximity of landing strips and helicopter pads should be avoided to ensure that activities can proceed without risk. If this is not possible, landing strips

will have to be moved. However, landing strip sites are selected considering certain safety precautions as well as its strategic location, and it may be difficult to find an alternative piece of land which fulfils the same criteria. The CAA recommends that there are no obstacles greater than 150 feet above the average runway elevation and within 2 000 metres of the runway mid-point.

For a substation site the following applies:

***Table 1**: Overview of Expected **Geographical Change Processes** and Potential Impacts*

GEOGRAPHICAL CHANGE PROCESSES			
Change Process Variable	**Potential Impact**	**Project Phase**	**Status**
Cultivated and grazing land	Temporary loss of cultivated and grazing land due to construction activities, leads to a decreased area for cultivation and grazing, resulting in an economic impact. Also permanent loss of cultivated and grazing land through the land acquisition process during operation.	Construction and Operation	Negative
Spatial development (future land use)	Developments may encroach upon the substation which may impact on health and safety. People who move into the servitudes of the power lines or the substation will have to be moved.	Operation	Negative

In light of potential changes in agricultural activities as a result of the presence of a Transmission power line and a site, the selection of preferred corridors and a site was guided by the following principles.

Principles:
The most preferred alternative would be one that crosses grazing land for cattle, followed by cultivated crop land where no GPS equipment is used for agricultural activities. Land used for game, and where GPS equipment to cultivate land is used is least preferred.

Game farm areas where game is captured by helicopter/aircraft should be avoided. It is proposed that power lines follow the borders of game farms and existing infrastructure such as roads and fences to mitigate the potential impacts of a power line going through areas where game is captured by helicopter/aircraft. Landing strips should be avoided.

Where the line does cross areas with centre pivots; the line should preferably follow boundary lines of the pivot.

Substation sites that allow for power lines to follow existing infrastructure, such as roads and power lines, should be given preference as the impacts on agricultural activities will be localised in one corridor. However, potential cumulative impacts of a number of power lines running together should be considered

Considering the potential affect on agricultural activities, the conclusions were:

- Corridors 1-3 have a high number of game farms, whilst corridors 4-6 are mostly covered grazing land (subsistence farming).
- Corridor 1 will potentially affect the least number of irrigation points, followed by corridor 3 and then 2.
- Corridors 1 and 2 will potentially affect the least number of landing strips, followed by corridor 3.
- Considering number of centre pivots and patches of cultivated land observed, corridor 2 seems to have more cultivated portions, followed by corridor 3 and then corridor 1.
- Corridor 4 will potentially affect the least number of irrigation points, followed by corridors 5 and 6.
- Corridor 4 seemed to have the highest number of portions for grazing (cattle).
- Corridor 7 will affect grazing (for game and cattle), and the line should preferably follow existing infrastructure to minimize the potential impacts.

To avoid potential negative impacts on agricultural activities as a result of the proposed transmission power line, the preferred corridors were corridors 2 and 4. Although corridor 2 did not seem to affect the highest number of irrigation points, it did seem to affect more crop portions. The implication was that in this corridor less land used for game would be affected.

Considering the potential effect of the site and the proposed 2x765kV transmission power lines on agricultural activities, sites 2, 3 and 4 are preferred. Site 1 was more likely to affect cultivation activities on land immediately surrounding the site, and was least preferred. The proposed 2x765kV transmission power lines would follow a longer length of the existing Matimba-Witkop transmission power lines should sites 3 and 4 be selected, and may localise impacts on agricultural activities. Sites 3 and 4 are therefore preferred.

Mining

The corridors were within areas of current and planned coal and platinum extraction and the potential impacts as a result of mining were taken into account. The consideration of current and planned coal mining activities was important, due to the following potential impacts (PBA international & Margen Industrial Services, 2007):

- *"Deep underground mining of coal, typically deeper than 500m, should have relatively little impact on power lines, but the mining of shallow coal reserves may lead to significant impacts on power lines in the near vicinity.*
- *Blasting in open cast mines presents an environmental hazard to power lines, threatening their operation and supply reliability.*
- *Dragline methods of excavation used in strip mining cannot be carried out in near proximity to overhead power lines for reasons of operational safety.*
- *Shallow underground mining presents a risk of collapse of the tower structures.*
- *With open cast methods, the process of coal extraction around the pillars is complex and more expensive."*

The indication was that the potential impacts of platinum mining on power lines are similar to that of coal mining.

Coal seams may be susceptible to heating and spontaneous combustion, and seams ignite readily upon prolonged exposure to oxygen. Operational opencast and underground mines are also affected by spontaneous combustion. Coal discard dumps at mines are also prone to ignition (Emalahleni IDP, 2007/2008). These potential fires will pose a safety risk to power lines operating in the vicinity of the corridors.

In light of potential health and safety impacts as a result of the presence of a power line in the vicinity of mining activities, a set of principles applied in the selection of a preferred corridor.

Principles:
Avoid open cast mining followed by deep cast mining. A 500 m buffer between open cast mining and a power line should be allowed.

Platinum mining occurs along corridor 3 and will be further developed. Considering the potential affect of mining activities in the vicinity of a power line, the preferred corridors were therefore corridors 1 and 2. Corridors 4, 5 or 6 were preferred as no mining occurred along these lines. No mining occurs on the proposed sites.

Nature Reserves

The proposed transmission power line corridors traverse a number of key tourism features, most notably the Waterberg Biosphere Reserve. Biosphere reserves are protected terrestrial and coastal environments of international conservation importance:

- They are unique categories of protected areas combining both conservation and sustainable use of natural resources.
- Biosphere reserves can be seen as building blocks for bio-regional planning and economic development.
- Biosphere reserves are community driven programmes assisted by government agencies.

According to the South African EIA Regulations, sensitive geographic areas and environmental sites include the core area of biosphere reserves as well as (amongst others) nature conservation areas, areas which harbour endemic/vulnerable/protected /endangered species, areas protected by legislation or identified by any policy or plan for the conservation of biological diversity, water resources, landscape or geological features and archaeological, palaeontological, architectural or cultural sites.

In general, nature reserves also have a conservation function in terms of biodiversity including landscapes, eco-systems, species and game.

In light of the function and importance of biosphere and nature reserves, a set of principles was applied in the selection of a preferred corridor.

Principles:

Transitional areas in the biosphere reserve should be the preferred areas for transmission power lines.

The conservation zones in the biosphere reserve should be avoided altogether, and where a proposed corridor crosses these zones, the corridor should be aligned to skirt these zones.

Core zones followed by buffer zones in the biosphere reserve should be avoided.

Power lines should rather affect game farms and nature reserves as opposed to the biosphere area – with consideration of principles applicable to mitigate potential impacts on game farming activities.

Considering the lack of compatibility of a power line with the function of a biosphere, corridor 2 followed by corridor 3 was preferred. Corridor 1 was not at all preferred as it passed through conservation zones. Corridor 2 passed through a transitional area and skirted a conservation area. Corridor 3 passed through a transitional area, skirted a conservation area, and passed between two conservation areas. Corridors 5 or 6 were preferred because of their distance from the Percy Fyfe Nature Reserve. Corridors 5 and 6 seemed to be mostly used for grazing of cattle.

The substation sites are not located in nature reserves, and a preferred site was therefore not selected.

Infrastructure

The proposed line would not negatively affect road infrastructure. A concern was the corridor of power lines the proposed lines would have to cross at Medupi Power station, and the potential cumulative impacts (health, safety, economic) should lines in this corridor be rendered ineffective e.g. as a result of an accident. However, the crossing of these lines seemed to be unavoidable.

Following an existing infrastructure, e.g. road reserve/power line servitude, would decrease the total number of people in the study area that would be affected by construction and maintenance activities.

From Medupi Power Station the Dinaledi-Marang lines go south. Corridor 3 might be in the vicinity of the proposed Dinaledi-Marang power lines for a short distance, and should this be the case potential cumulative impacts will have to be considered. Similarly, the routes of the proposed 400kV lines going north from the proposed Delta substation would have to be confirmed to assess potential cumulative impacts (if any).

Railway lines should preferably be crossed at a 90 degree angle, and where power lines follow railway lines, the power line should not be in the rail servitude due to potential electric interference.

Principles:

Situating a transmission line close to existing infrastructure such as roads is preferred as the number of people who might be affected would be reduced.

The decision to follow existing power lines should be informed by the potential cumulative impacts that will be affected.

Railway lines should be crossed rather than followed.

In terms of infrastructure principles, no preferred corridor were identified. None of the corridors followed existing infrastructure for significant distances, and the cumulative impacts of following existing lines have to be understood and considered in order to make the decision to follow existing lines.

Geographical Change Processes - Additional Studies

To fully assess the potential impacts as a result of geographical change processes, it was recommended that the following studies be conducted:

- The size and number of expected construction and operational vehicles and machinery as well as route(s) that will be used to gain access to the various sites and the construction activities on site need to be determined by interviewing the project proponent.
- The routes of the proposed Dinaledi-Marang transmission power lines and the location of the proposed Delta substation and its related power lines should be determined by interviewing the project proponent;
- Planned developments for the area in terms of residential, tourism, mining and agriculture need to be determined. Continue a desktop study of the IDP and SDF of the affected district and local municipalities in terms of future developments and tourism. If additional information is required other than that contained in the IDP/SDF, conduct interview(s) with relevant town planners and tourism bodies as well as review other relevant reports.
- The location of landing strips, centre pivots and dwellings/homesteads need to be confirmed, as well as the land use of affected farm portions. Participant Rural Appraisal should be executed, including one on one interviews and/or focus group discussions with affected landowners (including private landowners and Traditional Authorities).

Demographic Change Processes

***Table 1**: Overview of Expected Demographic Change Processes and Potential Impacts*

DEMOGRAPHIC CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Influx of construction workers	Influx of construction workers may lead to a change in the number and composition of the local population, and impact on economy, health, safety and social well-being.	All	Pre-construction and construction	Negative to neutral
Influx of job seekers	Influx of job seekers may lead to a change in the number and composition of the local population, and impact on economy, health, safety and social well-being.	All	Pre-construction and construction	Negative
Presence of maintenance workers	Although maintenance workers already active in the area will maintain the proposed lines, their activities may affect landowners who are not	All	Operation	Negative to neutral

DEMOGRAPHIC CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
	currently affected by maintenance activities.			

It was not expected that the changes and potential impacts due to the influx of job seekers and workers would differ significantly between the alternative proposed corridors and sites, and preferred corridors and site were therefore not be selected considering demographic change processes. It was not expected that relocation would lead to significant demographic changes, as people will mostly be relocated to areas within the project area.

Demographic Change Processes – Additional Studies

To assess the potential impacts as a result of demographic changes, the following studies were recommended for the Impact Assessment Phase:

- Conduct a comparative desktop study between Census 2001 and Community Survey 2007 data to determine significant socio-demographic trends within the study area. Through interviews/focus group discussions during Participant Rural Appraisal determine the profile of the potentially affected parties, including those of the workers;
- Request construction and maintenance information from the project proponent – work force size, skills level, origin, timeframes, activities and number of local job opportunities;
- Consult the Comments and Responses Report to determine the potential risk for conflict and other forms of active and passive social mobilisation and, if necessary, interview the public participation consultants on the local residents' viewpoints and expectations in terms of the proposed project within the social realm,;
- Interview the project proponent, other companies and the municipality about current and planned projects in the area, their timeframes and work force size as well as the location of construction camps to determine potential cumulative impacts;
- Access crime statistics and interview members of the SAPS if necessary to determine the current crime rate and nature of crimes committed in the area.

Economic Change Processes

***Table 2**: Overview of Expected Economic Change Processes and Potential Impacts*

ECONOMIC CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Direct formal employment opportunities to local individuals	Direct formal job opportunities for individuals and/or contractors (economic impact).	All	Pre-construction, construction and operation	Positive
Indirect formal and/or informal employment opportunities to local individuals	Indirect formal and/or informal job opportunities for individuals and/or contractors income (economic impact).	All	Pre-construction and construction	Positive
Loss of jobs	Economic impact as a result of reduction in tourists/hunters on affected and surrounding properties.	All – extent to be confirmed by detailed studies	Construction and operation	Negative
Loss of income and output	Economic impact as a result of reduction in tourists/hunters on affected and surrounding properties.	All - – extent to be confirmed by detailed studies	Construction and operation	Negative
Reduction in property values	Economic impact as a result of the presence of the power lines.	All - extent to be confirmed by detailed studies	Construction and operation	Negative
Benefits (regional and/or national)	Economic impact as a result of the construction and operation of the line – benefits economic growth. Economic impact associated with the payment of compensation (number of properties per alternative and compensation costs).	All	Pre-construction, construction and operation	Positive/Negative

The potential economic impacts on tourism as a result of the presence of the transmission power line were assessed within the context of "sense of place." The concept of sense of place is applicable to tourist areas because people go on holiday for various and different reasons, e.g. to escape, to be entertained, to enjoy nature, to socialise, etc. In choosing a destination the image of the place is being considered, e.g. its authenticity, its offering, its status (Limpopo is marketed as "The Preferred Eco-Tourism Destination"). If expectations are not met, clientele will be lost.

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)."*

A survey completed by MasterQ Research (2007) on a previous project of a similar nature, concluded:

- There might be a decrease in international and local visitors with very specific expectations, should Transmission power lines cross game farms. It seemed as if the hunting experience included a natural setting and an appreciation for a pristine natural environment for most hunters. Although research amongst visitors should be conducted to confirm this hypothesis, it was expected that some international tourists come to a game farm in Africa to experience the wilderness. A visible Transmission power line would detract from the experience, and other farms without lines might be preferred. This might impact on job opportunities.
- Not all potential tourists would be lost. Game farms with power lines crossing their property were still in business. In fact, some of these owners reported a 100% occupation in the hunting season. Visitors included international hunters. However, results of depth interviews with game farmers indicated the presence of a power line detracted from the sense of place of a game farm, which had financial implications. Game farmers said that they lost some of their income potential due to the visual impact of the power line on their property, and that it was not easy to mitigate the presence of the line. Game farmers interviewed indicated that it was difficult to quantify the loss in income as a result of the line going through their property. However, they had comments from tourists regarding the negative visual impact of the line.
- The decision whether to hunt on a farm with a power line depended on the hunters’ expectations. Hunters might want a wilderness experience, but also a good trophy and value for money. A game farm with a power line might be given preference should it better fulfil the expectations of the visitor. The bigger the farm, the easier it would be to manage the farm and hunting safari around the Transmission power line. It would also be more difficult to mitigate the potential negative visual impact in flat areas.

- The strategic placement of the line would be crucial to reduce potential socio-economic and socio-cultural impacts. The final recommendations in the Social Impact Assessment would have to be informed by the visual impact assessment.
- Should hunters not book as a result of the line, the money already spent on marketing might proof to have been a waste of money. The game farm owner might have to change his target market once a power line is on his farm. This might involve a new marketing strategy. It will take years to build up a strong customer base in a new segment of the hunter population.
- Not only game farms with power lines experienced the possible loss of visitors, but also the neighbouring game farms. Neighbouring game farmers might have to divert game routes and roads on their farms to steer hunters clear of the lines. This would have an economic impact.

Ideally, a study needs to be done to determine the loss of livelihood as a result of a line. Such a study should involve a baseline measurement of the situation prior to the construction of the power line, followed by an assessment post the construction of the power line. The assessment should be done over a period of years, and changes in other variables such as marketing etc. should be considered in the assessment. A control group should also be part of the study to assess whether measured changes could be as a result of what was happening in the area, e.g. a decrease in tourism figures was happening in the whole area, and not only on those properties with a power line. The control group should consist of farms with and without a Transmission power line.

International research in the United States of America (www.powerlinefacts .com) estimated an average of a 4.1% decline of property values, with a high of 7.6% as a result of the presence of power lines on such properties.

The above potential negative economic impacts have to be weighed up against the positive economic impact on regional and national level as a result of the operation of the line.

Based on the discussion in this section, certain principles for the selection of a corridor were derived.

Principles:

Altogether, it would be preferable to select a route that runs parallel to existing roads, railways or power lines, and away from conservation areas/lodges/tourism destinations and their buffer zones. This also presents the advantage in the sense that less land for cultivation/grazing/game farming is lost, and health and safety impacts are managed. The cumulative impact of putting a number of transmission power lines alongside each other on a game farm should be considered. One, two and even three power lines might be acceptable and manageable in certain situations, but a fourth line might tip the scale.

The most preferred alternative would be one that crosses grazing land for cattle, followed by cultivated land where no GPS equipment for cultivation is used. Land used for game, and where GPS equipment is used is least preferred.
Between game farms for hunting and nature reserves, power lines should rather go through game farms. Where game farms may still be able to mitigate the impacts of a line by the hunting experience/trophy they offer, it will be more difficult for nature reserves.

The buffer zone surrounding a core and conservation area in the biosphere should be avoided, as tourists are likely to enter through this zone, and usually other recreation and tourism related economic activities take place in this area. Also, this zone is usually visible from the core area, and care should be taken to lessen the visual impact of the line in this zone.

The transition areas in the biosphere, where land-uses such as farms and urban areas are found, the development function of tourism is fulfilled, and those who have an interest in tourism seek to link conservation, economic development and cultural values. It is preferable that new lines run through these areas.

To mitigate economic impacts, it would be preferable to select a site that will have the least significant visual impact and the least impact on livelihood.

The disadvantages of locating the substation and turn-in lines far from existing settlements would appear to be the fact that it would reduce the probability that construction workers would provide a boost to the informal sector

Considering the potential economic impact of the power line, corridors 2 and 3 were nominated as the preferred corridors. Corridor 1 was not at all preferred, because it passed through the conservation area of the biosphere and because of its distance from the existing Matimba-Witkop transmission power lines. The selection between corridors 2 and 3 would have to be informed by detailed information regarding game farms along the corridors. Corridors 5 and 6 were preferred, because of its distance from the Percy Fyfe Nature Reserve, and because it followed existing lines which did not go through game farms.

Considering the potential economic impact of the substation sites, more detail about the livelihood activities on the sites were needed. In terms of proximity to settlements to provide a boost to the informal economic sector, site 4 was not preferred. However, the economic boost will occur during construction, which is a short term activity. Considering potential long-term economic impacts as a result of visual impacts, site 4 was preferred. According to the visual scoping assessment, only site 3 could impact tourists, as this site

is located in the vicinity of the N11. According to the visual scoping assessment, the preferred site was site 4.

Economic Change Processes – Additional Studies

To fully assess the potential impacts as a result of economic change processes, more information was needed on the following aspects:

- Request the necessary information from the project proponent regarding
    - The local employment opportunities that will be created, both directly and indirectly;
    - Number of jobs available and skills levels of these;
    - If available, the average period of employment and an outline of a typical salary package for skilled and unskilled labour;
    - The input cost of the project;
- Access Quantec data to determine the study area's contribution to the GDP;
- Use an input-output model to quantify economic impacts to address employment loss and gain, income loss and gain, and regional and national loss and gain;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and vulnerable people in the study area (poor, low-skilled, poorly educated people, access to services below RDP standard) to determine the size of farms, land use and the economic activities on land, to obtain information about the tourism industry, and the attitudes towards the housing of construction workers in the community;
- Interview estate agents in the area to assess the potential drop in property values as a result of the presence of power lines – particularly about the trends that occurred with the construction of the second line between Matimba and Witkop in 2004.

Empowerment and Institutional Change Processes

It was not expected that empowerment, institutional and legal change processes would differ significantly between the alternative proposed corridors. The selection of a preferred corridor should not be influenced by the level of acceptance/rejection of the project by landowners along the corridor.

Considering institutional processes and the potential burden on the municipality for the construction village, site 3 was preferred because of its shorter distance from settlements and the N11, followed by sites 2 and 3.

***Table 3**: Overview of Expected Empowerment and Institutional Change Processes and Potential Impacts*

EMPOWERMENT AND INSTITUTIONAL CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Attitude formation against the proposed project	Attitude formation against the project could have economic impacts and could impact on social well-being.	All	Pre-construction and construction	Negative
Negotiation process	A breakdown in the negotiation process in terms of land acquisition could severely delay the project and result in an economic impact on both the landowner as well as on Eskom.	All (but depends on ownership)	Pre-construction	Negative to neutral
Additional demand on municipal services	Additional demand on municipal services could impact on the availability of these services. A lack of services could impact on health.	All	Pre-construction and construction	Negative

Institutional and Empowerment Change Processes – Additional Studies

To fully assess the potential impacts as a result of institutional and empowerment change processes, additional studies should be conducted:

- Review the comments and responses report to determine the recurrent issues raised from the public's side and address the relevant social issues. An analysis of these issues would indicate the risk for social mobilisation;
- Obtain information from the local municipality on the existing capacity to deliver municipal services and to determine the capacity for an additional demand on municipal services;
- Discuss issues and concerns regarding the negotiation process and how these issues should be addressed with the project proponent; and
- Obtain and analyse information on any existing disaster management plans at similar installations in the study area. Also obtain information from the local municipality on any existing emergency and health care services (both governmental as well as private) and determine their capacity to handle potential disasters.

Socio-cultural Change Processes

Similar to empowerment, institutional and legal change processes, it was not expected that cultural change processes and potential impacts would differ significantly between the alternative proposed corridors.

Considering the potential socio-cultural impacts, the site 3 is closest to settlements, followed by sites 1 and 2. Site 4 was the preferred site, not taking into account potential impacts on cultural landscape during operation.

***Table 4**: Overview of Expected Socio-cultural Change Processes and Potential Impacts*

EMPOWERMENT AND INSTITUTIONAL CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Mental health	Presence of construction workers and job seekers on surrounding landowners' sense of safety and security and being in control.	All	Construction	Negative
Behavioural changes – sexual relations and alcohol abuse	Presence of construction workers and job seekers my impact on local people's health and safety.	All	Construction	Negative
Integration of construction workers into local areas	Socially acceptable integration, including the risk of spreading STIs and HIV/AIDS with an impact on health.	All	Pre-construction and construction	Negative
Cultural landscape	Psycho-social impact of construction activities and the presence of the lines.	All	Construction and operation	Negative

To fully assess the potential impacts as a result of socio-cultural change processes, additional studies need to be conducted:

- Request information from the project proponent on the construction process and the likely profile of a typical construction worker;
- Assess the visual assessment report;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and communities in the study area to gain an understanding of the cultural landscape;
- Conduct a desk-top study to determine the health profile of the area, including typical indicators such as HIV prevalence, etc.; and
- Interviews with municipal officials and other authority figures (such as the South African Police Service) to determine the current extent of social problems in the area and initiatives to combat them.

Conclusions

In light of the information in this report, the final selection should be between Corridors 2 and 3, and 5 and 6. In light of mining activities along corridor 3, which do not seem to be avoidable, Corridor 2 was preferred. Mining activities in corridor 2 can be avoided. However, in light of lack of detailed economic information along these two corridors, it was recommended that both these corridors be assessed in the EIA Phase of the project. Corridors 5 and 6 would have to be studied in more detail to determine the difference in significance of impacts of land use and demographic processes.

No fatal flaws were identified, although Corridor 1 and the existing Matimba-Witkop lines going through the core areas of the biosphere were identified as a serious concern due to the fact that these reserves are protected environments of international conservation importance. Also, the potential cumulative impacts of 4 (four) transmission power lines going through an area which mainly seem to consist of game farms, is a concern.

In selecting a final route the following principles should apply:

- Loss of browsing for browsers (in the form of trees within the servitude) would be a significant land use change because the area consisted of a high number of game farms and nature reserves with game.
- There was a concern that the presence of power lines might affect the tourism numbers negatively, resulting in financial loss. Research results (MasterQ Research, 2007) indicated that it was possible to carry on with game farm related activities in the presence of power lines, although the presence of lines did detract from the experience of visitors, and international visitor numbers might decrease. It seemed as if the number of power lines, the placement of power lines and the size of farms were important considerations for placement of the lines in order to reduce the potential economic impact of the line on the affected properties. Eskom would want scientific proof that a reduction in tourist numbers was as a result of the lines and not other factors. Because this is not easy to prove, and it is not possible to avoid game farms altogether in this area, the final route alignment should aim to mitigate potential negative impacts of the lines on the game farms, e.g. going through areas where the visual impact will be best mitigated.
- Where mining does occur, it would be best to put lines as close to mining areas as possible (without compromising safety) to mitigate the potential impact on game farms (land use and economic).
- Situating a transmission line close to existing infrastructure consolidates visual impacts, and therefore reduces the line's impact on sense of place and the cultural landscape for visitors and local inhabitants, potentially mitigating negative economic impacts such as loss of jobs. However, this does not apply to properties with tourism activities which are already affected by power lines, as the potential negative economic impacts may be more significant due to the cumulative impacts of the lines.
- Avoid, where possible, areas where there is no infrastructure (bushveld) to keep the sense of place intact, and attempt to avoid landing strips. The potential impacts of access roads for maintenance will be reduced as existing roads can be used.
- Should game farms not be avoidable, the bigger game farms should rather be targeted in order to mitigate potential negative impacts.
- Eskom would only purchase a property if more than 50% of the property is affected by the power lines. This would not be the case in the study area as most of the properties are very extensive. Lines should therefore rather follow the borders of farms, and not go through the middle of a farm portions. The boundaries of farms should be followed to allow landowners to carry on with their game capturing

activities and preserve the landscape of their farm. Following the boundaries of farms will also ensure that landowners could probably avoid these lines when they take guests out on trips.

- Should game farms be affected, lodges and hunting camps should be avoided. The homes of employees are likely to be in close vicinity of these lodges, and their homes will then also be avoided.
- Avoid, where possible, areas where game and bird watching takes place to reduce the impact on tourists' experience. These areas are likely to be watering holes and pans, and vulture restaurants.
- The input from the visual specialist is crucial to ensure that a corridor with the least significant visual impacts is selected.
- Landing strips and centre pivots should be avoided where possible.
- Tourism routes should be avoided where possible.
- It seems preferable to locate the line away from any towns or villages, as this could reduce the probability that the project would interfere with people's daily movement patterns or impact on their safety (more so during construction).
- It would seem preferable to select a route that is as remote as possible from existing settlements. However, in order to obtain a complete view of the social impacts derived from the project, it is also necessary to consider activities and structures that are associated with any transmission line. It is necessary to take into consideration the need for access roads for construction and maintenance activities. If a transmission line is remote from existing settlements, it is also likely to be far removed from existing infrastructure. The advantages described above may be neutralised by the need to construct longer access routes. For instance, longer access roads could increase the probability that:
    - The construction of these roads might necessitate the relocation of populations;
    - Access roads might interfere with people's daily movement patterns and impact on their safety;
    - Access roads might cut across private property, thereby increasing the number of landowners to be affected by construction and maintenance activities; and
    - Access roads could interfere with tourism and recreational activities.
- The disadvantages of locating the transmission line far from existing settlements would appear to be the fact that:
    - It would reduce the probability that construction workers would provide a boost to the informal sector; and
    - It would increase the distance that would have to be traversed by services infrastructure for construction camps. Hence, it would increase the burden on local authorities that are required to provide that infrastructure.

In light of the information in this report, the nominated preferred site for the substation site is site 4, followed by site 3. No fatal flaws were identified with any of the sites from a socio-economic perspective.

In nominating a preferred site the following principles applied:

- The avoidance of potential long-term negative impacts should be given preference over short-term positive impacts.
- Avoid, where possible, areas where there is no infrastructure (bushveld), to keep the sense of place intact.
- Between grazing land for cattle and cultivated land, rather affect grazing land.
- Substation sites that allow for power lines to follow existing infrastructure, such as roads and power lines, should be given preference as the impacts on agricultural activities will be localised in one corridor - provided the cumulative visual impact will not result in negative economic impacts.
- The input from the visual specialist is crucial to ensure that a corridor with the least significant visual impacts is selected.
- It seems preferable to locate the site away from any towns or villages, as this could reduce the probability that the project would interfere with people's daily movement patterns or impact on their health and safety (more so during construction).
- The use of existing access roads mitigate should be given preference. The construction of new roads might
    - necessitate the relocation of populations;
    - interfere with people's daily movement patterns and impact on their safety;
    - cut across private property, thereby increasing the number of landowners to be affected by construction and maintenance activities; and
    - interfere with tourism and recreational activities.
- The disadvantages of locating the site far from existing settlements would appear to be the fact that:
    - It would reduce the probability that construction workers would provide a boost to the informal sector; and
    - It would increase the distance that would have to be traversed by services infrastructure. Hence, it would increase the burden on local authorities that are required to provide that infrastructure.

ACRONYMS

AC	Alternating Current
CAA	Civil Aviation Authority
EIA	Environmental Impact Assessment
EMF	Electro and Magnetic Fields
GDP	Gross Domestic Product
GGP	Gross Geographical Product
GPS	Geographic Positioning System
HIV	Human Immuno-deficiency virus
IDP	Integrated Development Plan
ICNIRP	International Commission for Non-Ionising Radiation Protection
LED	Local Economic Development
LP	Limpopo Province
LPGDS	Limpopo Provincial Growth and Development Strategy
OHS	Occupational Health and Safety
SDF	Spatial Development Framework
SEIA	Socio-economic Impact Assessment
SIA	Social Impact Assessment
STD	Sexually Transmitted Disease
UNESCO	United Nations' Education, Scientific and Cultural Organisation
WDM	Waterberg District Municipality
WHO	World Health Organisation

1. INTRODUCTION

The aim of the proposed Mokopane Integration Project is to disseminate the power generated at the new Medupi power station, thereby supporting the upsurge in demand from the platinum group metals in the Mokopane area, whilst at the same time improving the reliability of the electricity supply to the Polokwane area. The proposed project includes the construction of a new substation in the Mokopane area as well as transmission power line infrastructure to integrate the new substation into the transmission network. The proposed Mokopane Integration Project will therefore include the following components:

- The construction and operation of a new 400/132kV substation near Mokopane;
- The integration of this substation into the transmission network by looping one of the existing Matimba-Witkop 400kV transmission power lines in and out the substation (i.e. two transmission power lines in parallel over a distance of approximately 10km);
- The construction and operation of a new 765kV transmission power line between the proposed Delta substation (near the Medupi Power Station) and the proposed Mokopane substation, covering a distance of approximately 150km;
- The construction and operation of a new 765kV transmission power line between the proposed Mokopane substation and the existing Witkop substation, covering a distance of approximately 60km;
- The construction and operation of a new 765kV transmission power line between the proposed Delta substation and the existing Witkop substation, covering a distance of approximately 200km; and
- The associated infrastructure, such as access roads, communication tower, etc., to integrate the new substation into the transmission grid and also to accommodate the new transmission power lines at the existing substations through, for example, the construction of new feeder bays at these substations.

Prior to implementing the project, an Environmental Impact Assessment (EIA) has to be conducted. As part of the overall EIA process that is conducted by Savannah Environmental, a Socio-economic Impact Assessment (SEIA) is conducted by MasterQ Research.

All of the above components were considered in two SEIA Draft Scoping Reports as part of the EIA studies. One report focused on the transmission power lines, and a separate Draft Scoping Report was compiled for the substation sites. This second Draft Scoping Report had to be submitted because a site for the proposed Delta substation was since approved, and the proposed route corridor for the proposed 765kV transmission power line between the Delta substation and the Medupi power station had to be assessed as part of the Mokopane Integration Project.

Eskom has also re-considered the proposed alternatives which were proposed from a technical perspective as well as in terms of the comments received from the public and have revised the original alternatives accordingly (Figures 1a and 1b).

This second Draft Scoping Report considers these revised alternatives. For the assessment in this report, one (1) proposed route corridor was identified between the Delta substation site and the Medupi power station, three (3) possible route corridors were identified for the proposed 765kV transmission power line from the Medupi power station to the proposed Mokopane substation, with a further three (3) possible route corridors from the proposed Mokopane substation to the existing Witkop substation.

The first subsection below gives a definition of a SEIA, 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 SEIA

The definition of a Social Impact Assessment (SIA) as defined by Vanclay (2002) gives an understanding of the backdrop against which this SEIA 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:

> *"SIA is 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 an 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.

Based on Vanclay's definition of a SIA, an Economic Impact Assessment can be defined as the process of analysing the intended and unintended aspects of a project that might contribute to the creation (gain) and destruction (loss) of individual, community, regional or national economic resources.

1.2 Objectives of the Study

The overall objective of the SEIA's Scoping Phase was to identify a preferred corridor, a preferred substation site and fatal flaws, by identifying issues and concerns associated with the proposed project within the socio-economic realm. A number of primary research objectives were derived from the overall objective. These primary research objectives were as follows:

- Identify the manner in which the proposed project might affect the social systems, land use activities and tourism activities in the study area, by describing and assessing the current baseline (status quo) conditions as well as expected future changes without project implementation, and with project implementation.
- The above-mentioned was to be considered in light of the following change process themes:
  - **Geographical processes**: land use patterns, including amongst others:
    - Settlement patterns and development;
    - Current and future agricultural and mining activities; and
    - Current and future developments in tourism.
  - **Demographic processes**: the number and composition of people, including temporary visitors;
  - **Economic processes**: the way in which people make a living and the economic activities in society;

    * **Empowerment, institutional and legal processes**: the ability of local government to supply and maintain the necessary services, and the ability of people to participate and have an influence on decision-making; and
    * **Socio-cultural processes**: the way people live, interact, their attitudes, beliefs and values.
- Identify information gaps that would have to be addressed during the EIA Phase;
- Describe the studies that would have to be conducted during the Impact Assessment Phase to address the identified information gaps and how these potential impacts would be assessed.

The approach and methodology that were followed to fulfil the objectives of the Scoping Phase are listed in section 1.2 below.

1.2 Approach and Methodology

Primary and secondary data sources were used to fulfil the objectives of the study.

Primary data collection methods during the Scoping Phase involved a field trip by motor vehicle on 10 and 12 June 2008, and a fly over on 11 June 2008. A GPS (Geographic Positioning System) was used to record waypoints of structures and activities relevant to the SEIA. Supplementary to the primary data, **secondary data** collection methods included the perusal of the following documentation:

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

Information that was relevant to the project was identified and assessed from these sources within the context of the pre-construction, construction, operational, and decommissioning phases of the proposed Mokopane Integration project.

1.3 Limitations and Assumptions

Any statistics in 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 and 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 data, which include:

- 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."*

In terms of this study, it was done 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, contradict information in this report and/or identify additional information might exist. Information gaps that need to be addressed for the EIA Phase of this study are listed in this document.

It was assumed that the decommissioning phase is similar to the construction phase, and 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.

Estimates and calculations were done considering a substation site will be constructed on either the proposed substation sites 1 and 2. The proposed corridors to sites 3 and 4 were not provided to the team, and might affect the calculations and estimates somewhat. Estimates should be seen as an indication of brought trends along the corridors. The substation site report has to be read in conjunction with this report to gain insight into the implications of selecting sites 3 and 4.

Although the specialists endeavoured to accurately record all the social activities and structures along the proposed corridors, the waypoints are not exact and may not be comprehensive. The GPS information was checked against Google Earth satellite images. The information will have to be confirmed and improved during the public participation process, with feedback from Interested and Affected parties, and during the next phase of the EIA.

It was assumed that the motivation for, planning and feasibility study of the project were done with integrity, and that information provided to date by the project proponent, the independent environmental assessment practitioner and the public participation consultant was accurate.

1.4 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 Health and Safety Act (OHS Act);
- 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;
- 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 Scoping Phase.

2. PROJECT BACKGROUND

This section provides a brief background to the proposed project, followed by an overview of the proposed corridors. The proposed project is then placed within a regional context by providing a general overview of the broader study area.

2.1 Project Overview

As mentioned in the introduction, the aim of the proposed Mokopane Integration Project is first and foremost to disseminate the power generated at the Medupi Power Station, thereby supporting the upsurge in demand from the platinum group metals in the Mokopane area, whilst at the same time improving the reliability of the electricity supply to the Polokwane area. The proposed project includes the construction of a new substation in the Mokopane area as well as transmission power line infrastructure to integrate the proposed substation into the transmission network.

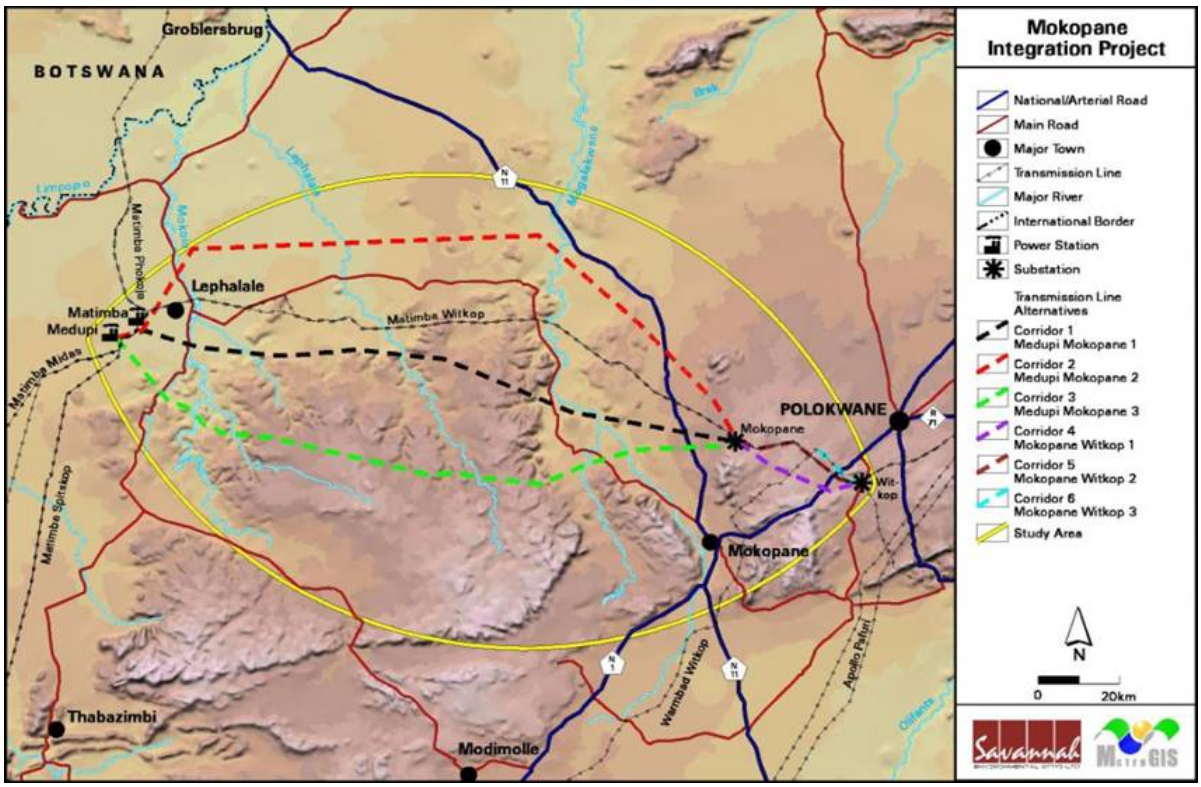
The proposed Mokopane Integration Project is required as a result of the fact that the existing transmission power lines in the area do not have sufficient capacity to distribute the additional 4 500MW of power that will be generated by the new Medupi Power Station, without compromising the transmission network's reliability. Eskom therefore investigated various options as means to optimise their transmission system and, in the instance of the Mokopane Integration Project; plan to construct new Alternating Current (AC) transmission power lines as an effective means to transmit electricity from the new Medupi Power Station to various substations within Limpopo Province.

Currently the existing Witkop substation close to Polokwane is the only nodal point within the broader Polokwane area that supports the platinum group metals' load growth. The load forecast for this group indicated a load shift towards the Mokopane area, which cannot be supplied from the Witkop substation alone as a result of thermal, voltage stability and spatial constraints.

2.2 Transmission Power Line Corridors

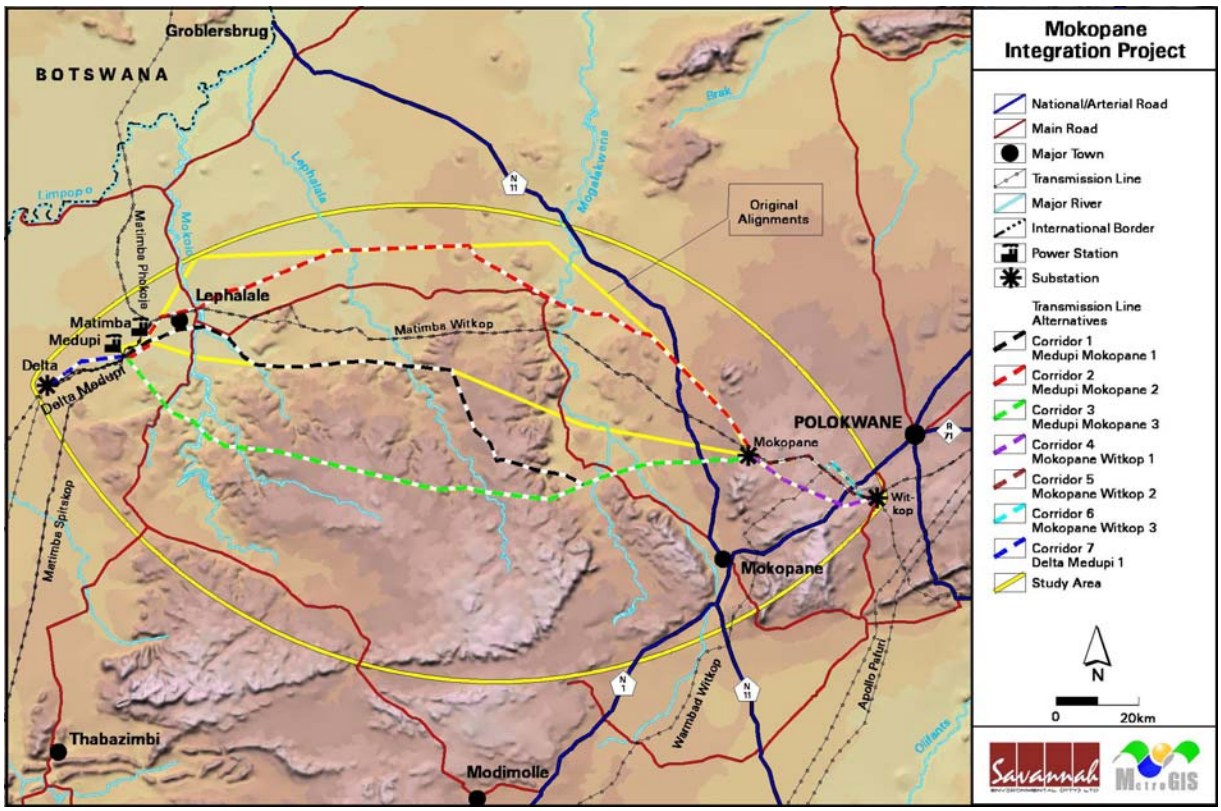
As previously mentioned, in total there are seven (7) potential transmission power line corridors, of which one (1) have been identified between Delta substation and Medupi power station, three (3) potential alternative corridors have been identified between the Medupi power station and the proposed Mokopane substation, with a further three (3) alternative corridors between the proposed Mokopane substation and the existing Witkop substation (refer to Figure 1b). One corridor has to be selected between Medupi and the proposed Mokopane substations, and one between the proposed Mokopane and Witkop substations. Figure 1a illustrates the corridors that were assessed in the first Draft SEIA Scoping Report.

***Figure1a**: Proposed Transmission Power Line Corridors between Medupi and Witkop (SEIA First Draft Scoping Report)*



Source: MetroGIS

***Figure1b**: Proposed Transmission Power Line Corridors between Delta and Witkop*



Source: MetroGIS

2.3 Substation Sites

All four of the alternative substation sites are located in the Mokopane area and are currently State-owned properties. Refer to Figure 2 for an overview of the proposed site alternatives.

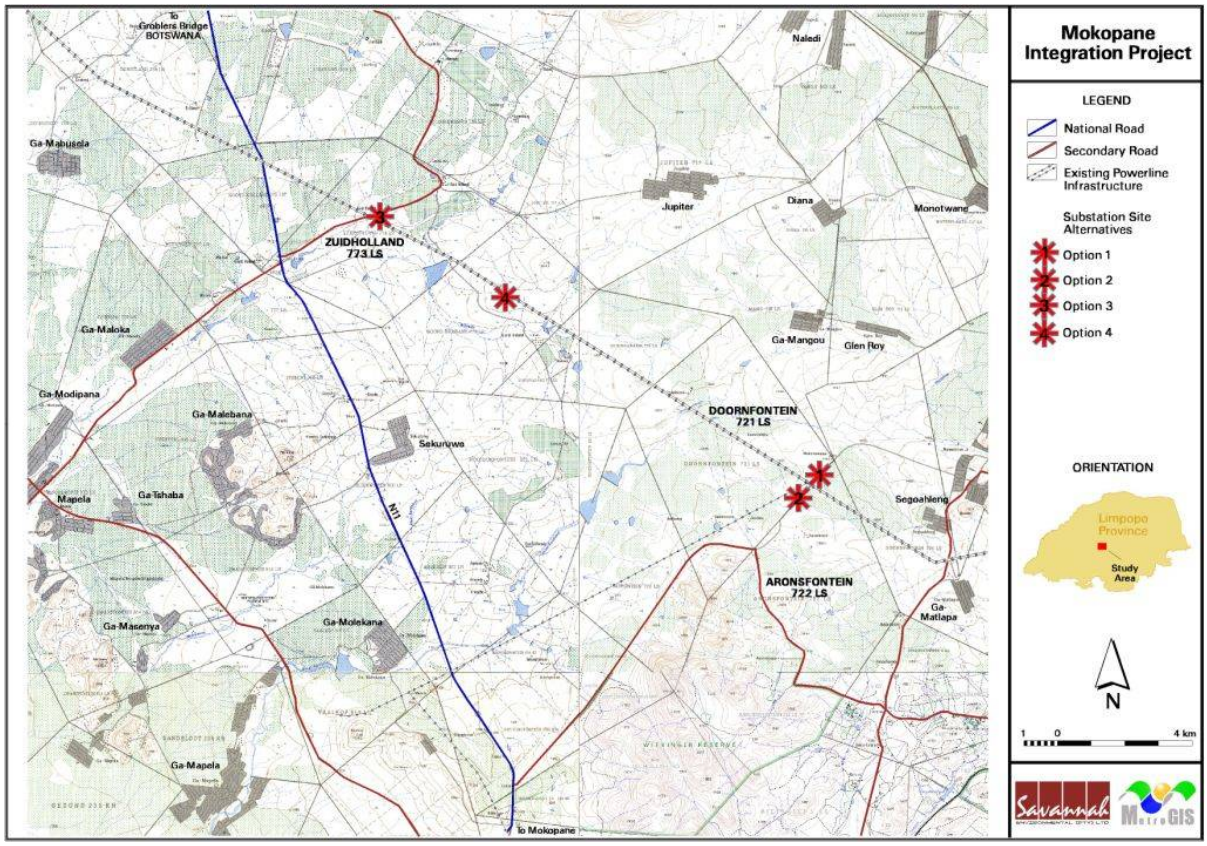
Option 1 is located on the southern border of the farm Doornfontein 721LS and on the northern border of the farm Aronsfontein 772LS, to the north of the existing Matimba-Witkop Transmission power lines.

Option 2 is also situated on the southern border of the farm Doornfontein 721LS and on the northern border of the farm Aronsfontein 772LS, to the south of the existing Matimba-Witkop Transmission power lines.

Option 3 is located on the farm Zuid Holland 773LR, along the existing Matimba-Witkop Transmission power lines.

Option 4 is located on the farm Noord Braband 774LR, along the existing Matimba-Witkop Transmission power lines.

***Figure 2**: Substation Site Alternatives*



Source: MetroGIS

2.4 Regional Overview

The proposed transmission power line corridors and substation sites are located within the Lephalale (LIM362) and Mogalakwena Local Municipal areas. Both these local municipalities are located within the Waterberg District Municipality (DC36) of the Limpopo Province. The following subsections give a broad provincial and district context within which the project will implemented.

2.3.1 Provincial Level

The Limpopo Province (LP) is the northern-most province of the Republic of South Africa and is bordered by Botswana to the west and north-west, Zimbabwe to the north, and Mozambique to the east. To the south lies the Gauteng Province and this makes the LP the link between South Africa and other African countries. The province is therefore seen as the centre of regional, national and international developing markets. The LP is divided into six district municipalities (refer to Figure 3), of which only the Waterberg District Municipality (WDM) is relevant to the study area.

Despite its beneficial location in terms of international trade, the LP is regarded as one of the poorest provinces in South Africa. In the LP there is an almost equal split between the employment and unemployment rate of the economically active population, with 59.6% being employed in 2007 (Community Survey). Of those employed, 18.4% are employed within the community services sector source (Community Survey 2007).

***Figure 3**: District Delineation within Limpopo Province*

The province covers an area of approximately 123 910km^2, and according to the Community Survey 2007, has close on 5.2 million people living within its borders. This brings the population density to an average of 40 people per km^2. The province is largely rural in nature, with approximately 11.0% of its population residing in urban areas.

In 2002, the LP's economy constituted 6.5% of the total economy of South Africa, compared to 5.7% in 1995. For the period 1996 to 2002 the economy of the province grew at an annual average rate of approximately 4%, which was higher than that of all the other provinces. The economic sectors of mining, tourism and agriculture are viewed as the main driving forces behind economic development in the province (Limpopo Provincial Growth and Development Strategy (LPGDS 2004-2014).

In 1997 a Mara Research Station (Mogalakwena IDP 2008/09) study found that there were approximately 2 400 game farms in Limpopo Province, totalling an area of 4.1 million hectare. Of these game farms, close on 40% were owned by people who resided outside of the province.

Results of a socio-economic study conducted by MasterQ Research (2007) for the SIA for the proposed Mmamabula-Delta transmission power lines to the north east of Lephalale indicated that of the 29 surveyed establishments that **primarily** focussed on game/hunting activities, 12 (41%) had been in operation for less than six years, and five (17%) for 6-10 years. The average years that an establishment was in operation was estimated at 11 years, with a standard deviation of 8.6 years. These results indicate that the number of game farms in the LP have increased since the 1997 Mara Research Station study.

A total of 3% of all foreign tourists to South Africa visited LP during 2003, of which 58% were for leisure purposes, and 13% for business. Most of these tourists (approximately 70%) travelled to the province to visit the Kruger National Park. The number of visitors to the province doubled in 2004, with a total of 6% of all foreign tourists visiting LP. In terms of domestic tourists, the province is the 5th most popular province, with 9.4% of all domestic tourists visiting the province (Bohlweki Environmental 2005).

The province has rich agricultural resources. Apart from its agricultural resources the province also has an abundance of mineral resources. Mining is seen as a critical economic sector in the province.

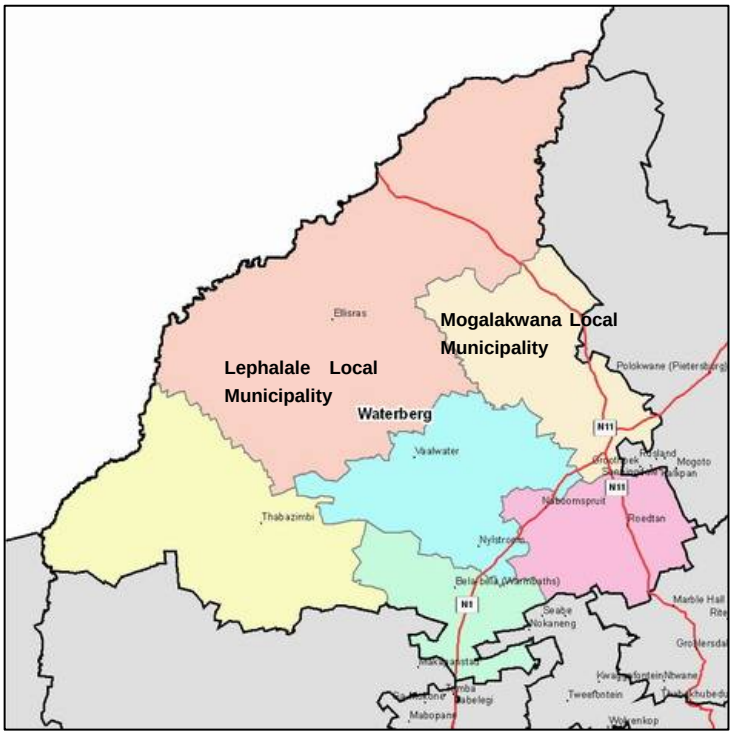
Implications of the information in this section for the SEIA:

- Potential positive impacts of the project on economic growth on local level should be enhanced.
- Potential negative impacts of the project on local economic growth should be avoided.
- Agriculture contributes significantly to the economic growth of the province, and agricultural land should be preserved.
- Mining contributes significantly to the GGP, and the impact on potential future mining developments should be considered in the impact assessment.
- The tourism industry is one of the three most important economic sectors in the province and therefore the potential economic impact on this industry should be considered.
- The province is one of the poorest provinces in the province, and indication that the local communities may be vulnerable to changes that will be brought about by the project. The assessment should take cognisance of this.

2.3.2 District Level

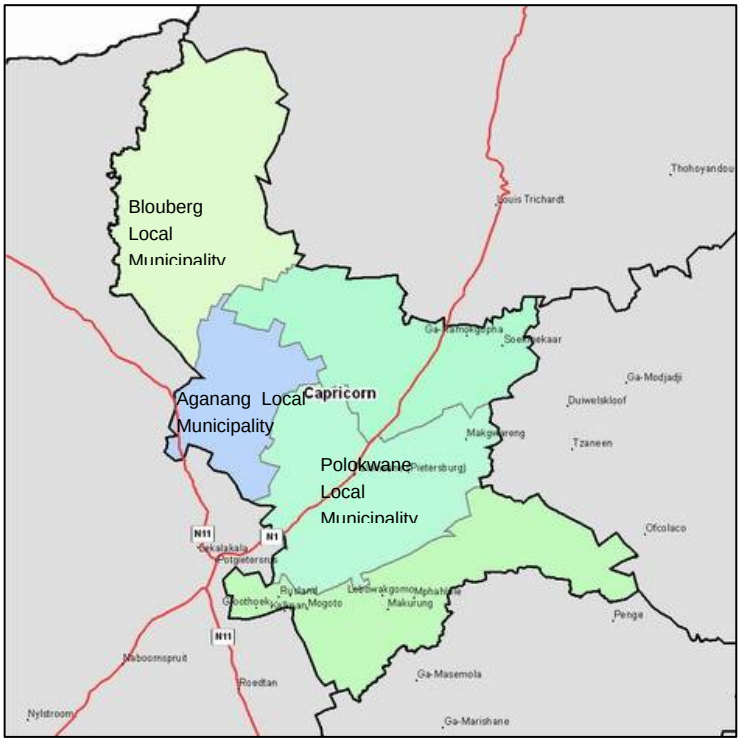
The affected municipalities are the Waterberg District Municipality and the Capricorn District Municipality. The Waterberg District Municipality (WDM) is made up of six (6) separate local municipalities, including the Mogalakwena and Lephalale Local Municipalities (see Figure 4). The WDM is the largest of the six districts and lies to the west of the LP. The district is mostly rural in nature and, according to the Community Survey 2007, has a total population of approximately 596 092 people living in 160 720 households (at an average of 12 people per km^2, much lower than the average provincial density of 40 people per $km^{2)}$.

***Figure 4**:Lephalale and Mogalakwana Local Municipalities' delineations within the Waterberg District Municipality*



The Capricorn District Municipality (CDM) consists of 5 local municipalities, including the Aganang, Blouberg and Polokwane Local Municipalities (see Figure 5). The CDM is located within the centre of the LP and, according to the Community Survey 2007, has a total population of approximately 1 243 167 people, which is more than double the population size of the WDM. The average population density of the CDM is estimated at around 73.3 people per km^2, which is much higher than that of the WDM and the province as a whole. This increased population density might be as a result of an urban area such as Polokwane forming part of the CDM.

Figure 5: *Local Municipalities' delineation within the Capricorn District Municipality*



In 2007 (Community Survey), the unemployment rate within the district was estimated at around 29.0%, which was much lower than that of the province. Furthermore, approximately a third (33.0%) of the district's population was under the age of 14 years, which would make any job opportunities vital to the future development of the district.

The WDM is characterised by discrepancies in wealth and skills. The majority of households earned an annual income below R18 001 in 2001 (WDM IDP 2008/09). Households' production levels are declining leading to a situation where the majority of the population are financially dependent on state pension and social welfare grants as their primary source of income and subsistence. This is linked to the low educational levels, and lack of skills.

Employment in the formal sector within the CDM continues to decline causing the overall unemployment rate to rise. The traditionally labour intensive industries namely mining and agriculture, which employed unskilled and semi-skilled labour, have had little or no growth over the past decade. According to the CDM IDP (2005), for the district to become internationally competitive many businesses require skilled labour, which further marginalized or over exploited the rural communities.

The WDM IDP (2008/09) states that the key economic sectors within the WDM are mining, electricity/water, services, trade/catering and agriculture, with mining making the biggest contribution to the GGP. The WDM's Integrated Development Plan (2008/09) states that the land use pattern is fairly natural within the district, with most of the mining operations concentrated on the periphery, whereas the central area is mostly characterised by the tourism and game industry.

It is expected that mining, electricity/water, services, and trade/catering will increase in future due to the Matimba Power Station which is located in Lephalale and is the largest direct dry cooling power station in the world. The station uses coal from the nearby Grootegeluk Mine and has sufficient coal reserves to guarantee a lifespan of 35 years at 3 800 tons of coal per hour. The new Medupi Power Station is currently under construction in the same area, and the Delta substation is planned. The Lephalale Local Municipality have earmarked a heavy industrial area between the Matimba Power station and the Grootgeluk mine, seeing as the large amounts of coal deposits in the area form the basis for future industrial development. The presence of this newly established heavy industrial area is meant to lure prospective investors into the area.

Although the WDM is one of the biggest contributors towards provincial agricultural activities with proportionally the largest grazing field, the agricultural sector is considered to be an under developed sector. This sector only contributed approximately 3.6% towards the economy of the district (year not mentioned). Field crop commodities include tobacco, cotton, sunflower, sorghum, and maize (WDM IDP 2008/09).

A large portion of CDM depends on agricultural development and economically on Potatoes as the most important crop in the CDM. (CDM IDP 2005).

Currently there are a vast amount of manufacturers in the Capricorn District, of which majority are situated in the Polokwane municipal area. The processing of raw materials from mining and secondary activities emanating from processing of agriculture products in Capricorn will contribute significantly in expanding the manufacturing sector within Capricorn District Municipality (CDM IDP 2005). Investment in construction has increased in the years immediately proceeding 2007. However while there are many manufacturers, few employ more than 100 people and as a result many engage in hawking and informal household shops, which sustain their basic needs but unfortunately do not contribute to economic growth within the CDM.

The WDM IDP (2008/09) states that the tourism industry is also a significant contributor to the Gross Domestic Product (GDP), but it does not state the extent of this sector's contribution. Similar to the province as a whole, a trend in the area is the conversion of agricultural land into game farms resulting in a rapid expansion of game farming and tourism in the area. The WDM is malaria free and has a rather mild climate that adds to the district's appeal as a tourist destination. The WDM area is also in fairly close proximity to the Gauteng Province (approximately 3 hours drive), which makes it not only an appealing destination, but also a prime location to develop game farms (WDM IDP 2008/09).

The CDM is currently a tourism destination and a gateway to other destinations in the province and country. The potential exists for further development of tourism activity (CDM IDP 2005).

The Waterberg District Municipality's (WDM) Integrated Development Plan (IDP 2008/09) states that only approximately 0.43% of the district's total land surface area is used for settlement purposes (i.e. towns and villages). Of these towns and villages, by far the majority (approximately 69%) are located within the Mogalakwena Local Municipality's area of jurisdiction. In Lephalale Local Municipality, only 37% of the population lives in settlements with high population concentrations and growth potential. The urban areas (such as Mokopane and Lephalale) dominate the district's urban settlement pattern.

In both the Mogalakwena as well as the Lephalale Local Municipalities the villages are scattered, which creates problems for these municipalities in terms of improving the municipal service delivery to these areas.

Dwelling types within the both the WDM as well as the CDM include both formal housing and informal housing, but mainly formal housing. Dwelling types differ by race, with a higher percentage of the Black African population within the WDM living in single rooms, hostels and traditional dwellings. In general, most of the non-Black African population live in formal housing structures (WDM IDP 2008/09). The CDM IDP 2005 states that the majority of its population reside in formal housing structures which are at least on par with RDP standards.

Implications of the information in this section for the SEIA:

- Local Economic Development should be enhanced by
    - providing job opportunities to locals;
    - avoiding potentially negative impacts on tourism.
- Agriculture contributes significantly to the economic growth of the province, and fertile agricultural land should be preserved.

- Both mining and tourism contribute significantly to the economy, and current and potential future developments in these sectors should be considered in the impact assessment.
- The development trend for scattered villages is difficult to determine.
- Service delivery to rural areas is a challenge, and this might be further affected by the presence of the construction workforce.

3. SOCIAL CHANGE PROCESSES AND POTENTIAL IMPACTS OF THE PROJECT

This section focuses on the study are within the affected local municipalities (Figure 1). A baseline social profile of the study area was developed according to the various social change processes outlined in section 1.2. These baseline social profiles allowed for a broad assessment of the study area, which in turn assisted with the identification of social sensitive areas in terms of population, land use and tourism activities.

The assessment generated certain principles for route selection. These principles will also be applied in the EIA to propose a final preferred route, and to inform the development of guidelines for mitigation measures. **Principles** give an indication of a course of action that ought to be taken. **Mitigation measures** are statements which provide advice or direction to ensure that whatever course of action is decided upon, the likelihood of negative impacts are reduced, and the potential positive impacts are enhanced.

3.1 Geographical Processes

Geographical processes relate to land use patterns, including infrastructure, in the area. 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 (www.soil.ncsu.edu/publications/BMPs/glossary.html)."*

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 (www.wikipedia.org/wiki/Land_use.html)."*

This section focuses on:
- Settlement development patterns and with and without the project;
- Agricultural activities with and without the project;
- Mining activities with and without the project;
- Current and future developments in nature reserves with and without the project; and

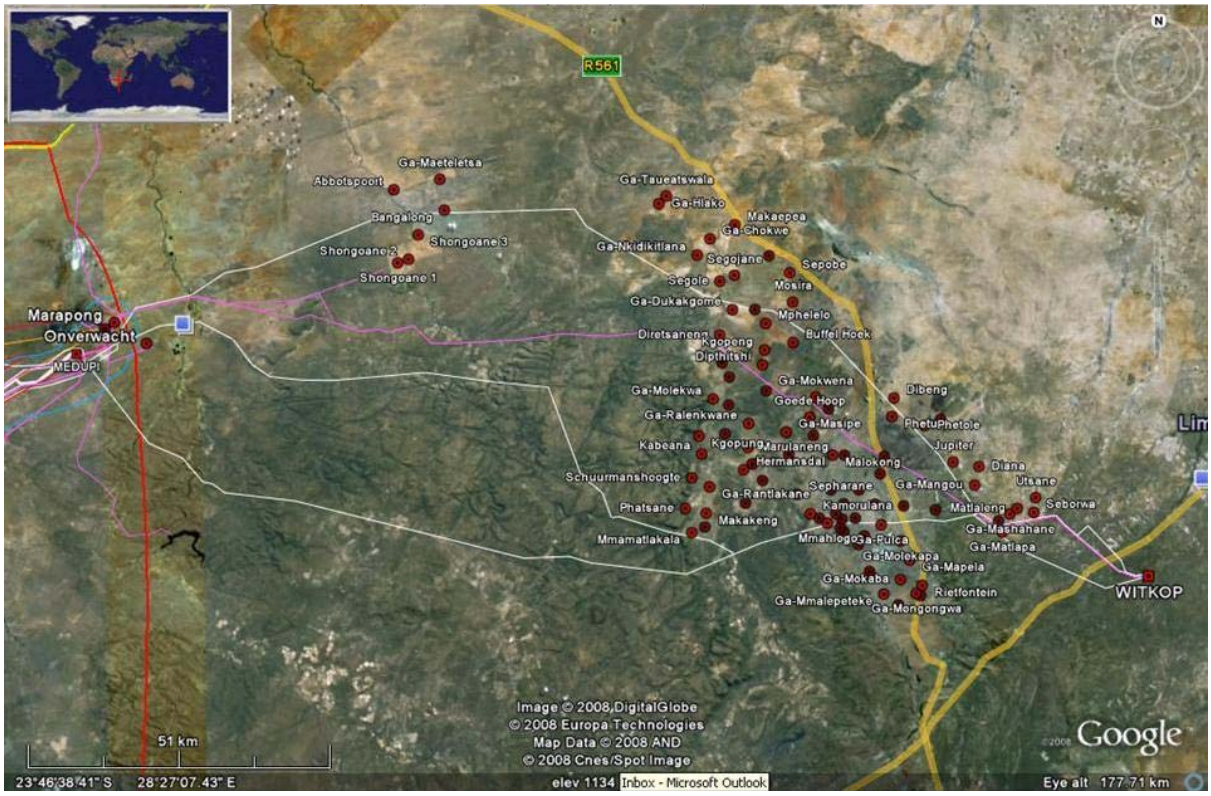
- Infrastructure development with and without the project.

Settlement Patterns

3.1.1 Settlement development patterns without the project

Figure 6 provides an overview of the formal settlements in the study area. At the time of the study, information was not available on the planned future development of these settlements.

***Figure 6**: Formal Settlements in the Study Area*



Source: *Google Earth*

3.1.2 Settlement and development patterns with the project

A power line may impact on the development and movement patterns in the area. Movement across and in a servitude is not prohibited, but structures are not allowed in the servitude of a power line, which is 80 meters for a 765kV transmission power line. Where structures such as dwellings fall in the servitude, these structures will have to be demolished and the inhabitants will be displaced and relocated.

Once a power line is operational, development may occur towards and into the servitude despite the fact that structures in a servitude are prohibited. Because **movement** across a servitude is not prohibited, it is not likely that the physical division caused by a

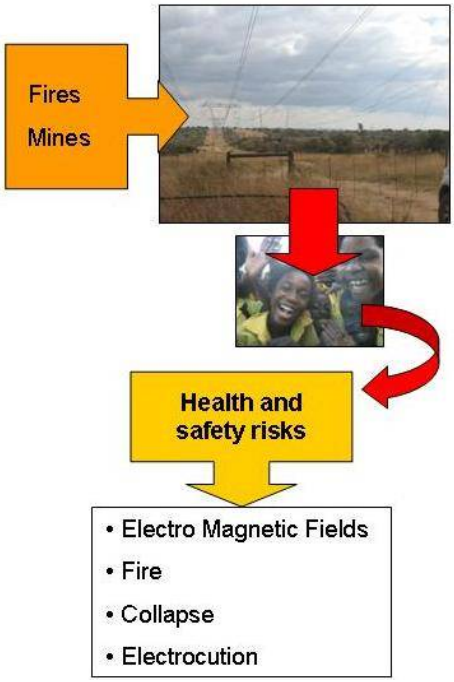
servitude will significantly change movement patterns and impact on the maintenance of relationships.

A proposed transmission power line may impact on the development patterns in the area, because structures are not allowed in a servitude. Once a power line is operational, development may occur towards and into the servitude because of normal growth, merging of villages/developments, lack of alternative space, municipal development plans or job expectations because of a project (such as building a transmission power line). Developments into servitudes were, for example, observed in the Virginia area in Free State Province, in the City of Johannesburg in Gauteng Province, and in the Volksrust area in KwaZulu Natal Province.

Where structures, such as dwellings, fall in the servitude, these dwellings will have to be demolished and the inhabitants will be displaced and **relocated**. The displacement and **relocation** of people may impact on people on a psychological level. The significance of impacts of relocation on a person depends on the level of attachment to a place, which in turn is informed by variables such as age, number of years spent in that particular area, personality, and reasons for living in that specific area.

Where people have been living in a specific area for years, they are used to their surroundings, e.g. the route they travel to work, the amenities (shops, businesses, leisure) they visit, the quality of life they enjoy, the people they know and visit, etc. Apart from their surroundings, one could also expect that they are attached to their homes and what it represents.

The main social concerns which arise when considering the presence of a transmission power line close to human settlement and potential settlement in the servitude are **health and safety** aspects as illustrated in the diagram that follows. The intention is that the servitude mitigates these potential health and safety related impacts. Risks are related to Electro and Magnetic Fields (EMF), electrocution, fire and collapse. A line could cause fatal/traumatic accidents because of collapse of a tower and/or lines as a result of mechanical failure, fire and mining activities. Fire can be caused by electrical malfunction or human error.



Utilities in South Africa involved in the generation and distribution of electrical energy, are bound by the Occupational Health and Safety (OHS) Act [63] to provide such services in a safe manner. There are currently no regulations (under the Hazardous Substances Act) in terms of exposure to power frequency EMF in South Africa and the International Commission for Non-Ionising Radiation Protection (ICNIRP) guidelines are used for assessing human exposure to these fields. The guidelines for electric and magnetic field exposure set by the ICNIRP, an organisation linked to the World Health Organisation (WHO), receive world-wide support (Pretorius 2006). To manage the risks, the line runs in a servitude in which buildings, and crops higher than 2-4 meters are not allowed (depending on voltage of the line).

The results of a study commissioned by Eskom Holdings Limited (Pretorius 2006) on the possible health effects of EMF noted the following:

- The main focus of research has been on a possible association between long term exposure to magnetic fields and childhood leukaemia.
- Based on the epidemiological findings, the risk of EMF being a health hazard is small.
- Based on current understanding of the topic, EMF is regarded a possible but not proven cause of cancer.
- The suggestion for this health outcome stems mainly from a fairly consistent pattern of the increased but small risk observed from some epidemiological studies. This finding has not been confirmed by (notably all) controlled laboratory studies.
- No evidence of a causal relationship between magnetic field exposure and childhood leukaemia has been found and no dose-response relationship has been shown to exist between EMF exposure and biological effects.

- A possible explanation for the epidemiological findings may be confounding (a factor other than EMF) or bias (subjects studied are not representative of the target population for which conclusions are drawn) which render the data inconclusive and prevent resolution of the inconsistencies in the epidemiologic data.
- In general, studies of animal reproductive performance, behaviour, milk production, meat production, health and navigation have found minimal or no effects of EMF. The literature published to date has shown little evidence of adverse effects of EMF from overhead power lines on farm animals and wildlife.

It was concluded that electric and magnetic fields with levels typical of a power line environment, complying with the requirements for proper servitude management as prescribed by the electric utility, are unlikely to affect plants in terms of growth, germination and crop production.

Considering electrocution, transmission lines could pose a safety risk. Induced charges can build up on fence wires mounted on wood posts near power lines (www.greatriverenergy.com/community/power_line_safety.html). This phenomenon is generally restricted to higher voltage lines (200 kV or greater). The magnitude of the build-up depends on a variety of factors:

- The size of the power line;
- The length of fence paralleling the line;
- The distance between the line and the fence;
- The amount of moisture in the fence posts and the ground; and
- The presence of grounding devices such as metal fence posts or weeds growing next to the fence.

In light of potential health and safety impacts and the potential impacts of displacement, the selection of a preferred corridor and substation site should be guided by the following principles:

Principles:
Avoid displacement of people.
Avoid settlements and dwellings.
Avoid interference with current and expected/planned future development.

Corridor 1 and **3:** In addition to scattered households, a number of human settlements are close to corridors 1 and 3. Except for Mmamatlakala and Makakeng, these settlements are similar for both corridors (refer to Figure 6):

Settlement	Proximity of proposed transmission line to settlement	Potential changes
Corridor 1		
Phatsane	Approximately 4km to the south	None
Makakeng	Approximately 4km to the south	None
Mmamatlakala	Approximately 2.1km to the south	None
Onverwacht	Approximately 600m to the north	Limits potential future development to the north
Maropong	Approximately 3.3km south east	Limits potential future development between Maropong and Onverwacht
Lephalale	Through the northern part of Lephalale	Displacement of people
Corridor 3 Mmamatlakala	Approximately 5.1km to the south	None
Corridors 1 and 3		
Ga-Matlana	Follows the road	None
Kamorulana	Approximately 2.2km to the south	None
Ga-Mabuela	Approximately 1.1km to the south	None
Mmahlogo	Approximately 100m to the south	Limits potential future development to the south
Ga-Mosoge	Approximately 1.2km to the south	None
Mogope	Approximately 60m to the north (possible formal settlement in servitude)	Displacement of people – approximately 2 households Limits potential future development to the north
Mapela	Approximately 120m to the south	Limits potential future development to the south
Ga-Tshaba	Approximately 600m to the south	None
Ga-Masenya	Approximately 1.5km to the north	None
Ga-Pulca	Passes through settlement (formal settlement in servitude)	Displacement of people – approximately 18 households Physical division of the settlement
Sakuruwe	Approximately 2.2 km to the south	None
Ga-Molekapa	Approximately 2km to the north	None

Corridor 2: In addition to scattered households, the closest human settlements to this corridor include the following areas (refer to Figure 6):

Settlement	Proximity of proposed transmission line to settlement	Potential changes
Onverwacht	Approximately 4.5km to the north west	
Maropong	Approximately 1.5km to the south	Limits potential future development between Maropong and Onverwacht
Abbotspoort	Approximately 3.7km to the south	None
Ga-Monyeki	Approximately 2.6km to the north	None
Shongoane 3	Approximately 2.6km to the north	None
Bangalong	Approximately 500m to the south	Limits potential future development to the south
Ga Musi	Through the village	Displacement of people
Village close to Ga Musi	South of village	Displacement of people
Ga Maeleletja	Approximately 4.7km to the south	None
Ga Monare	Through the village	Displacement of people
Ga Mathekga	Approximately 300 meter north	Limits potential development to the north
Village close to Ga Mathekga	Approximately 1.2km to the south	Displacement of people
Galebelo	Through the village	Displacement of people
Mosira	Approximately 3.2km to the south	None
Segojane	Approximately 4.8km to the south	None
Dibeng	Approximately 800m to the west	Limits potential future development to the west
Phetu	Approximately 200m to the east	Limits potential future development to the east
Phetole	Approximately 2km to the west	None
Madietane	Approximately 4.3km to the west	None
Jupiter	Approximately 400m to the west	Limits potential future development to the west
Diana	Approximately 5.2km to the west	None
Ga-Mangou	Approximately 2.5km to the west	None

Corridor 4, 5 and 6: In addition to scattered households, the closest human settlements to these corridors include the following areas (refer to Figure 6).

Settlement	Proximity of proposed transmission line to settlement		
	Corridor 4	**Corridor 5 / 6**	**Potential Changes**
Boetse	Approximately 2.2km to the south	Approximately 650m to the south	None
Ga-Matlapa	Approximately 260m to the south	Approximately 315m to the north	Corridor 4 limits potential future development to the south. Corridors 5 and 6 limit future development to the north.
Ga-Mashashane	Approximately 3.2km to the southwest	Approximately 1.3km to the south	None
Matlaleng	Approximately 5.6km to the southwest	Approximately 2.2km to the south	None
Seborwa	Approximately 7.1km to the south	Approximately 580m to the south	Corridor 4 – none. Corridors 5 and 6 limit future development to the south.
Utsane	Approximately 9.7km to the south	Approximately 2.8km to the south	None

In terms of scattered dwellings on farm portions, it is estimated that the number of dwellings that may be affected are as follows (refer to Figure 8):

Approximate number of dwellings along the corridors			
Corridor 1	**Corridor 2**	**Corridor 3**	**Corridor 7**
10	7	35	1
Corridor 4	**Corridor 5**	**Corridor 6**	
6	6	6	

The future development plans for these dwellings are unknown, and will have to be further investigated in the EIA Phase.

In terms of the current and future development of Lephalale, the development of the town is planned towards the south, starting with the construction of the P138-1 road (Figure 9). A nodal linkage between Maropong and Onverwacht is planned.

Lephalale town development potentially affected by the corridors	
Corridor 1	Passes north of Onverwacht and Lephalale, potentially impacting on the development of the towns to the north (Onverwacht). Plans may have to be adapted to accommodate the line.
Corridor 2	Passes between Maropong and Onverwacht. Plans may have to be adapted to accommodate the line. Not likely to impact on development of lephahale to the north.
Corridor 3	Does not affect current and future development plans of the town.

In terms of the proposed substation sites, the existing Matimba-Witkop 400kV Transmission power lines already prohibit development towards the servitude. Development is likely to occur to the north and south of the existing power lines. In terms of scattered dwellings on farm portions, no dwellings will be directly impacted by the proposed substation or turn-in lines at any of the proposed sites.

In terms of the proposed substation sites (Figure 7):

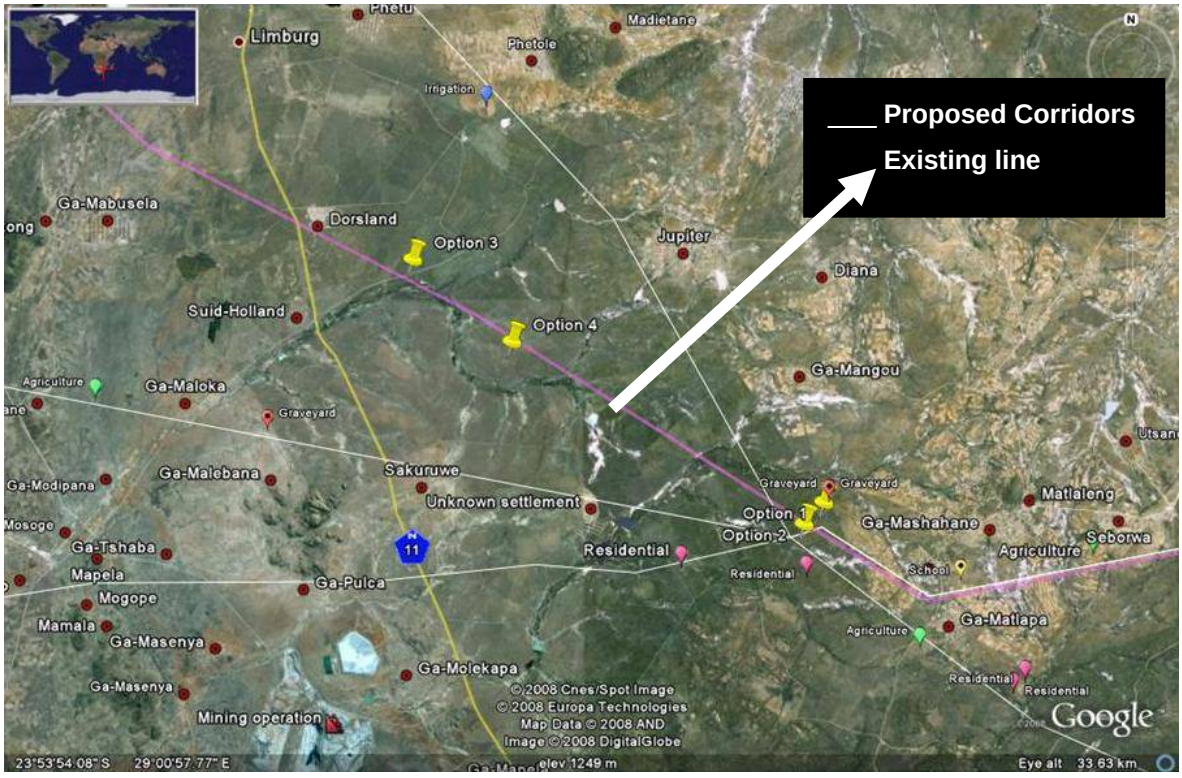
Option 1. The closest human settlement to this site is Segoahleng, which is located some 3km east of the proposed site. Other human settlement in fairly close proximity to the proposed site includes Ga-Matlapa (approximately 4.7km southeast), Glen Roy (approximately 4.3km north), and Ga-Mangou (approximately 4.1km north-northeast).

Option 2. Again the closest human settlements are Segoahleng (approximately 3.8km east), Ga-Mangou (approximately 4.8km north), Glen Roy (approximately 5.2km north-northeast), and Ga-Matlapa (approximately 4.9km southeast).

Option 3. The closest human settlements to this option is Dorsland, which is located approximately 2.8km southeast and Suid-Holland, which is located approximately 3.3km southwest of the proposed site. Other human settlement in the vicinity of the proposed site includes Sakuruwa (approximately 6km south), Ga-Maloka (approximately 7km west-southwest), Ga-Malebana (approximately 7.5km southwest), and Ga-Mabusela (approximately 9.1km west).

Option 4. The closest human settlement is Sukuruwe, which is located approximately 4.9km southwest of the proposed site. Other formal settlements in fairly close proximity to this option include Jupiter (approximately 5.4km northeast), Suid-Holland (approximately 6.2km west), Ga-Mangou (approximately 8.8km east) and Phetole (approximately 8.9km north).

***Figure 7**: Formal settlements within the study area*



Source: *Google Earth*

3.1.3 Preferred corridors and substation site considering settlement patterns and development

Considering these principles, the following conclusions are drawn:

- Corridor 2 will potentially impact the highest number of households (relocation), followed by corridors 3 and then 1.
- Corridor 2 will potentially affect the highest number of settlements' potential future development.
- Corridors 1 and 2 will affect planned future developments between Maropong and Onverwacht.
- Corridors 1 will affect planned future developments for Lephalale town.
- Corridor 7 will not impact on any developments.

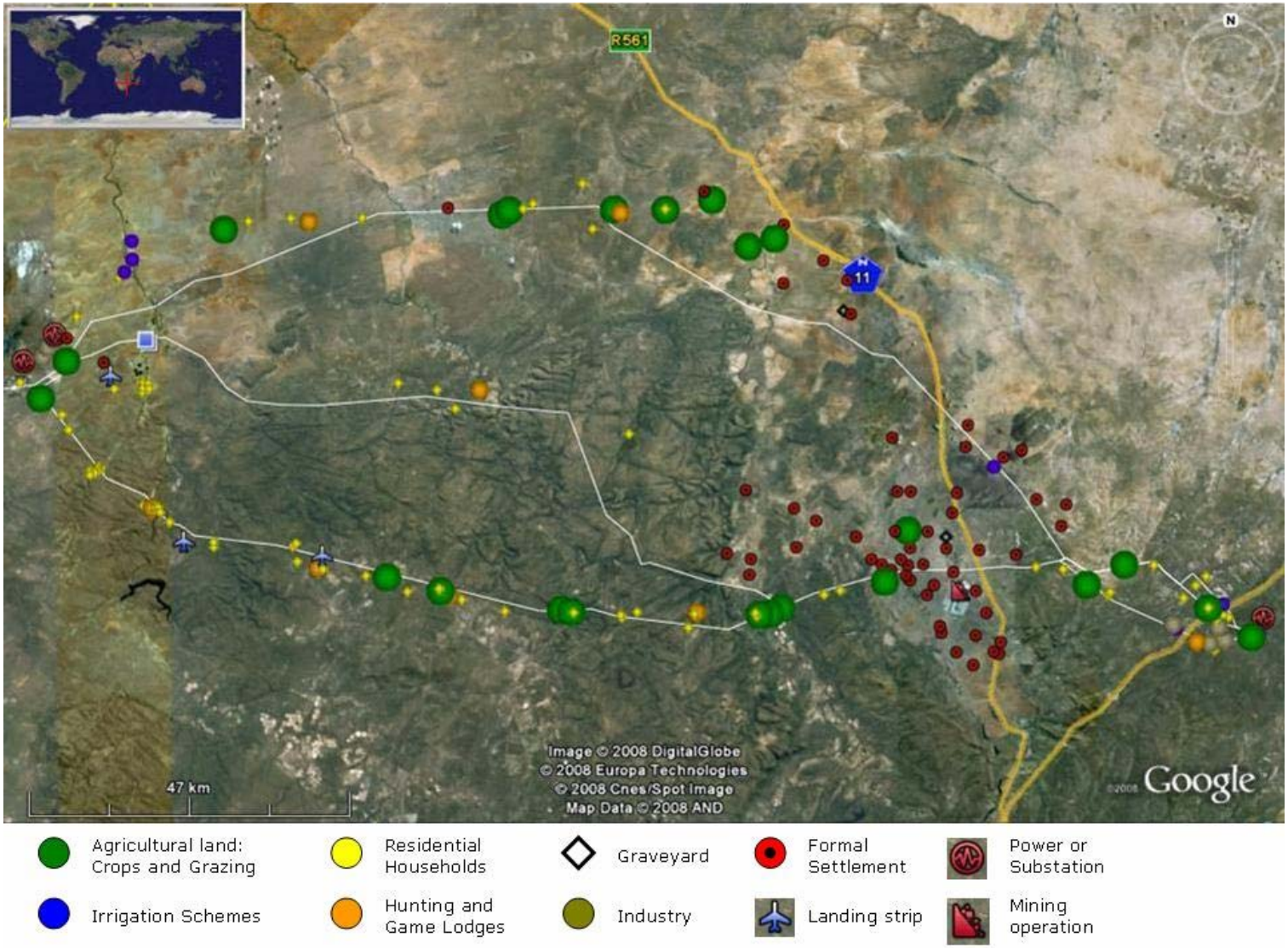
To avoid potential negative impacts on health and safety and of displacement of people, the preferred corridors are corridors 3 and 4. Although corridor 3 would potentially affect a number of households, this corridor would also potentially affect the lowest number of settlements' potential future development, and would have the least effect on Lephalale town's spatial development framework.

Considering the potential affect on settlement patterns and development (current and future) in selecting a preferred substation site, the following emerges:

- In terms of access roads, there is no preferred site.
- Site 3 is closest to settlements, followed by sites 1 and 2. In terms of potential health and safety impacts, site 4 is preferred.
- Transmission power line corridors not following the existing Matimba-Witkop transmission power lines and entering and exiting sites 1 and 2 will potentially affect more settlements.
- Considering proposed transmission power lines going to sites 3 and 4, it is possible to avoid settlements and not affect their development.

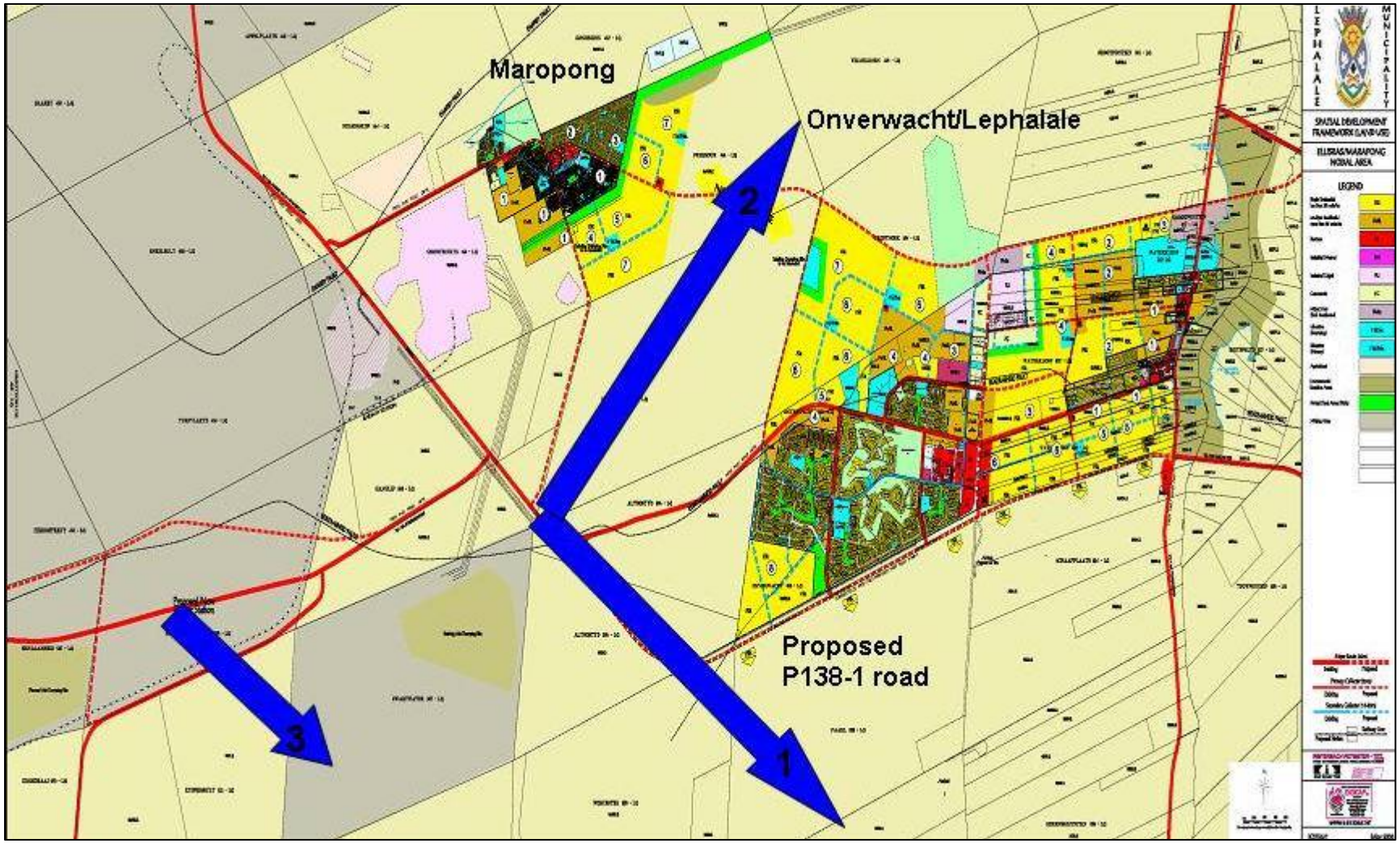
To avoid potential negative impacts on health and safety and settlements developments, the preferred site is site 4.

***Figure 8**: Overview of Land Use along the Route Corridors*



Source: *Google Earth* and social waypoints (GPS) from field trip

***Figure 9**: Lephalale Spatial Development Framework*



Source: Lephalale SDF 2006

3.1.4 Current and future agricultural activities without the project

Field cropping and animal production were the main activities in the area. During recent years game farming has become a major economic activity in the area and this upsurge in eco-tourism and commercial hunting lead to a decrease in traditional agricultural activities. It is likely that game farming activities will increase (MasterQ Research 2007, see section 2.3.1). For this study, the assumption is therefore made that the grazing portions identified along the corridors are mainly for the purposes of game farming.

Figure 8 provides an overview of the agricultural activities along the corridors. It was not possible to do a detailed study of every farm along each corridor, and therefore activities on farm portions as indicated on a 1:50 000 map and observed during the fieldtrip were considered. A number of farm portions may constitute one farm, and this information will have to be collected in the EIA Phase. It is estimated that the activities on farm portions constitute the following (based on observation and 1:50 000 maps):

Approximate number of…	Corridor 1	Corridor 2	Corridor 3	Corridor 4	Corridor 5	Corridor 6
Irrigation points	1	1	1	1	0	1
Cultivated portions (including irrigation points)	3	7	5	2	0	1
Portions for grazing	40	56	41	6	2	7
Landing strips	1	1	7	0	0	0

At the time of the study it was believed that the land on which all of the substation sites were located is State-owned. Evidence could be found on Google Earth of a cultivated piece of land in close proximity to site 1. It would appear as if all sites are used for grazing. As these farms are not privately owned, it is assumed that the area is used for grazing by community members from the surrounding settlements.

3.1.5 Current and future agricultural activities with the project

This section focuses on how the project will affect land use activities in terms of cultivated land, grazing land, and game farming with hunting activities.

To accommodate the substation, land will be permanently lost for agricultural activities. The loss of land will potentially impact on livelihoods. It will still be possible to use the land surrounding the site for agricultural activities. However, the presence of power lines entering and exiting the site will potentially affect agricultural activities, specifically the

cultivation of land. Although it is possible to cultivate land in a servitude, the presence of power lines complicates the process.

Temporary loss of cultivated and grazing land will occur due to construction activities around the site and access roads. It may happen that construction teams leave gates open, don't follow access roads, cut through fences and steal cattle. The effect could be that less land is available for cultivation and grazing, the cross breeding of cattle could occur, game/cattle may be lost, and erosion is hastened.

In terms of the Transmission power line, the activities will be affected as follows:

Cultivated Land

Construction:
Land for cultivation will be lost temporarily during the construction process and in some instances more land for cultivation may be lost as a result of road construction to access the servitude.

Operation:
- It is possible to cultivate land around transmission power line pylons, although it does complicate the process, e.g. ploughing around pylons and anchor lines.
- Centre pivot irrigation is compatible with transmission power lines as long as certain basic precautions are taken:
    - Prevent a solid water stream or irrigation pipes from hitting the wires. Even a small amount of exposure to electrical current is dangerous. It takes less than 15 mill-amperes to produce a painful shock. This is only a fraction of the electrical current needed to power a 60-watt light bulb, which draws about 500 mill amperes. More than 20 mill-amperes of current can be deadly, especially to small children.
    - The irrigation system should be well grounded.
- Crop spraying by plane becomes problematic and dangerous where power lines are in the vicinity.
- The Electric and Magnetic fields seem to interfere with GPS equipment and other advanced electronic equipment when these are used in the vicinity of a power line.
- Land for cultivation may be lost permanently as a result of access roads for maintenance purposes.

Grazing Land

Construction:

- Land will be lost temporarily during the construction process and in some instances more land for grazing and browsing may be lost as a result of road construction to access the servitude.
- The capturing of game to allow construction activities to take place: stresses game, is time consuming, is not without risk. Hunting activities will have to be co-ordinated to ensure the safety of hunters and workers.
- It may happen that construction teams leave gates open, don't follow access roads, cut through fences and hunt game. The effect could be that less land is available for cultivation and grazing, the cross breeding of cattle could occur, game/cattle may be lost, and erosion is hastened.

Operation:

- Transmission power lines traversing grazing land pose fewer problems compared to cultivated land, as cattle and game move around the pylons. The likelihood of animals becoming stuck in pylons is slight, e.g. an animal putting its head through a gap in the pylon and getting stuck.
- Land will be lost temporarily during the construction process and in some instances land for grazing and browsing may be lost permanently as a result of road construction to access pylons for maintenance purposes.
- Trees more than 4 meters in height are not allowed in a servitude. The loss of trees in the servitude improves grazing for grazers, but reduces grazing opportunities for browsers.
- It may happen during the operational phase that maintenance teams leave gates open, don't follow access roads, cut through fences, and hunt game. The effect could be that less land is available for cultivation and grazing, the cross breeding of cattle could occur, and erosion is hastened. Maintenance activities have to be carefully planned and executed to ensure the least distress to game, and to co-ordinate hunting activities.

Game farming

Construction and Operation:

- Apart from the loss of grazing land, game capturing by helicopter/aircraft become difficult to execute in the vicinity of a power line. The helicopters fly low, and could collide with the line when herding game, if these lines are not clearly marked. Should pilots fly higher to avoid the line, they may not be able to effectively herd the game. As a result of ineffective herding, game could collide with fences, and be injured.
- Lines in close proximity of landing strips and helicopter pads should be avoided to ensure that activities can proceed without risk. If this is not possible, landing strips will have to be moved. However, landing strip sites are selected considering certain safety precautions and strategic location, and it may be difficult to find an alternative piece of land which fulfils the same criteria. The CAA recommends that there are no

obstacles greater than 150 feet above the average runway elevation and within 2 000 metres of the runway mid-point.

In light of potential changes and impacts related to agricultural activities as a result of the presence of a power line and substation site, the selection of a preferred corridor should be guided by the following principles.

Principles:
The most preferred alternative would be one that crosses grazing land for cattle, followed by cultivated crop land where no GPS equipment is used for agricultural activities. Land used for game, and where GPS equipment to cultivate land is used is least preferred.

Game farm areas where game is captured by helicopter/aircraft should be avoided. It is proposed that power lines follow the borders of game farms and existing infrastructure such as roads and fences to mitigate the potential impacts of a power line going through areas where game is captured by helicopter/aircraft. Landing strips should be avoided.

Where the line does cross areas with centre pivots; the line should preferably follow boundary lines of the pivot.

Substation sites that allow for power lines to follow existing infrastructure, such as roads and power lines, should be given preference as the impacts on agricultural activities will be localised in one corridor. However, potential cumulative impacts of a number of power lines running together should be considered

3.1.6 Preferred corridors and substation site considering current and future agricultural activities

Considering the potential affect on agricultural activities, the **indication** is that (based on observations during the field trip and a Google Earth assessment):

- Corridors 1-3 have a high number of game farms, whilst corridors 4-6 are mostly covered grazing land (subsistence farming).
- Corridor 1 will potentially affect the least number of irrigation points, followed by corridor 3 and then 2.
- Corridors 1 and 2 will potentially affect the least number of landing strips, followed by corridor 3.
- Considering number of centre pivots and patches of cultivated land observed, corridor 2 seems to have more cultivated portions, followed by corridor 3 and then corridor 1.
- Corridor 4 will potentially affect the least number of irrigation points, followed by corridors 5 and 6.

- Corridor 4 seemed to have the highest number of portions for grazing (cattle).
- Corridor 7 will affect grazing (for game and cattle), and the line should preferably follow existing infrastructure to minimize the potential impacts.

To avoid potential negative impacts on agricultural activities as a result of the proposed transmission power line, the preferred corridors are corridors 2 and 4. Although corridor 2 does not seem to affect the highest number of irrigation points, it does seem to affect more crop portions. The implication is that in this corridor less land used for game will be affected.

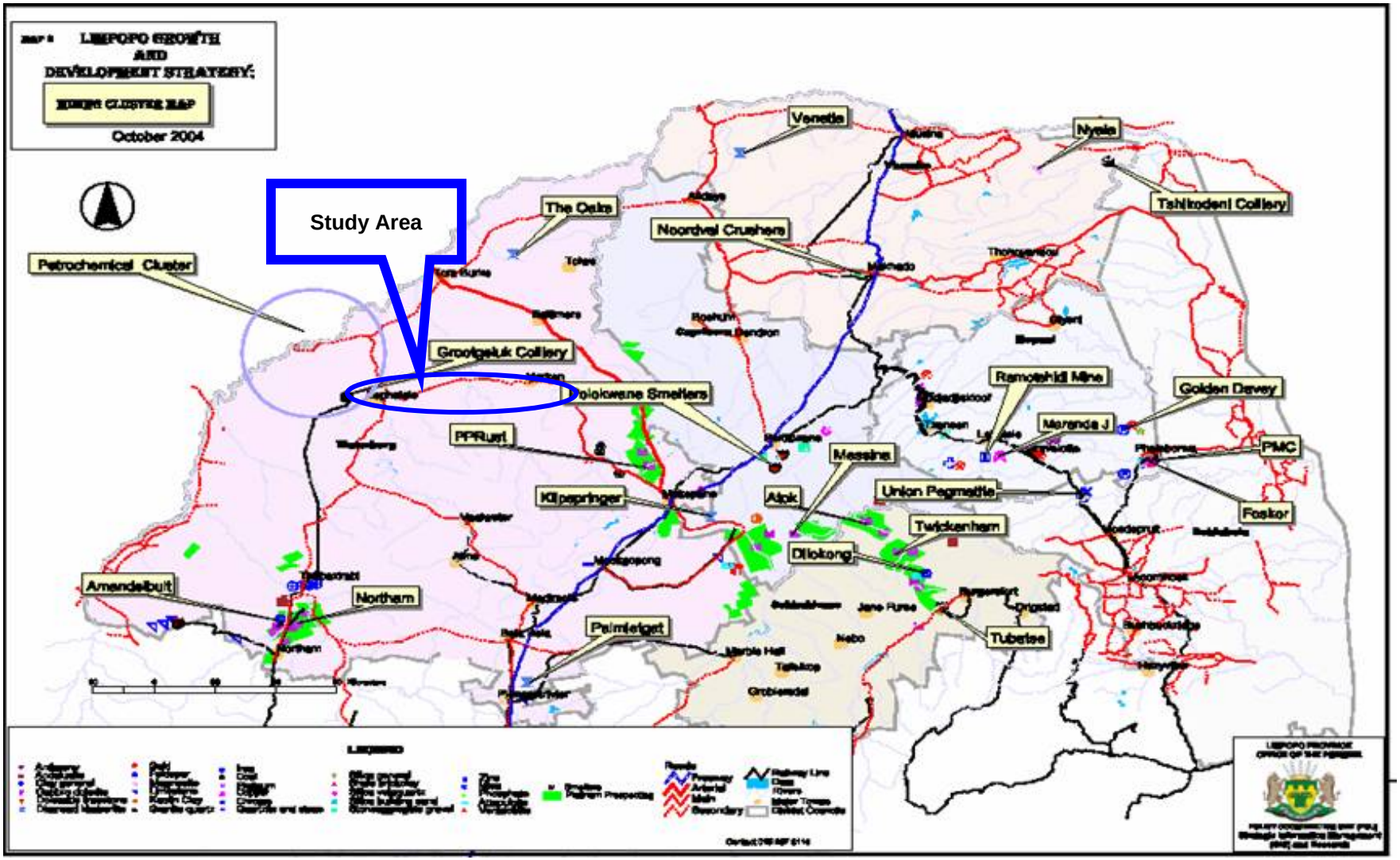
Considering the potential effect of the site and the proposed 2x765kV transmission power lines on agricultural activities, sites 2, 3 and 4 are preferred. Site 1 is more likely to affect cultivation activities on land immediately surrounding the site, and is least preferred. The proposed 2x765kV transmission power lines will follow a longer length of the existing Matimba-Witkop transmission power lines should sites 3 and 4 be selected, and may localise impacts on agricultural activities. Sites 3 and 4 are therefore preferred.

Mining

3.1.7 Current and future mining activities without the project

Figure 10 provides an overview of the mining industry within the province. The only mining that currently occurs in the study area is the mining at the Grootegeluk Mine and Platinum Mining along corridor 3 (Mokopane Platinum Mine).

***Figure 10**: Overview of Mining Clusters within Limpopo Province*



Source: LPGDS 2004-2014

3.1.8 Current and future mining activities with the project

Planning a route for new power lines within areas of likely coal extraction needs to take the potential economic and safety impacts as a result of these land uses into account. The identification of current and planned mining activities is important, due to the following (PBA international & Margen Industrial Services 2007):

"Deep underground mining of coal, typically deeper than 500m, should have relatively little impact on power lines, but the mining of shallow coal reserves may lead to significant impacts on power lines in the near vicinity.

Open cast and strip mining of coal are the typical methods of mining coal reserves shallower than 60m below ground level.

Blasting in open cast mines presents an environmental hazard to power lines, threatening their operation and supply reliability. A minimum 500m buffer is normally required around blast sites, though a greater buffer area is likely to be required for lines that have the strategic importance of these between Mmamabula PS and Delta Substation.

Dragline methods of excavation used in strip mining cannot be carried out in near proximity to overhead power lines for reasons of operational safety. The need for foundation stability means that an area much wider than the footprint of the towers needs to be preserved. This will vary according to the depth of the coal.

The span between pylons may be 350m or more and it is theoretically possible to mine the coal between the pylons. However, this presents technical complications in mine operation and, for power line operation and maintenance reasons, the entire servitude will need to be preserved for access to the pylons, thereby sterilising coal reserves within along the entire servitude.

Furthermore, the linear nature of power lines may eventually separate parts of the coal reserves from the main body if insufficient borehole exploration has been done by the time construction starts on the power lines. This could isolate an even greater area of coal reserves.

In most cases mines request Eskom to move power lines if coal reserves are discovered after the lines have been constructed and open cast methods are planned. Furthermore, from experience with lines in these areas Eskom seeks to try to provide a buffer between open cast operations and power lines.

Shallow underground mining presents a different impact on power lines. Depending on the depth of the coal seam, even mining 150 to 250m below ground results in some surface settlement after mining has been complete. Settlement may only be 300mm or so, but may also be a metre or more where the coal seams are 5m or more (conditions vary depending on depth of the coal and type of overlying material). This presents a risk of collapse of the tower structures.

It is understood that pylons may be designed to accommodate limited settlement - possibly 200mm depending on foundation conditions. However, settlement is difficult to predict with any accuracy and it is more common to either move the overhead lines or to leave 'pillars' of coal under the pylons. The pillars will again be greater than the pylon footprint and, as with open cast methods; the process of coal extraction around the pillars is complex and more expensive."

The indication is that the potential impacts of platinum mining on power lines are similar to that of coal mining.

Coal seams may be susceptible to heating and spontaneous combustion, and seams ignite readily upon prolonged exposure to oxygen. Operational opencast and underground mines are also affected by spontaneous combustion. Coal discard dumps at mines are also prone to ignition (Emalahleni IDP, 2007/2008). These potential fires will pose a safety risk to power lines operating in the vicinity of the corridor.

In light of potential health and safety impacts as a result of the presence of a power line in the vicinity of mining activities, a set of principles apply in the selection of a preferred corridor.

Principles:

Avoid open cast mining followed by deep cast mining. A 500 m buffer between open cast mining and a power line should be allowed.

3.1.9 Preferred corridor considering current and future mining activities

Platinum mining occurs along corridor 3 and will be further developed. Corridors 1 and 2 will not affect the planned mining north of Grootegeluk Mine. Considering the potential affect of mining activities in the vicinity of a power line, the preferred corridors are therefore corridors 1 and 2. Corridors 4, 5 or 6 are preferred as no mining occurred along these lines. Corridor 7 will not be affected by mining.

No mining occurs on or in close vicinity of the proposed substation sites.

Nature reserves

3.1.10Current and future developments in reserves without the project

The proposed transmission power line corridors traverse a number of key tourism features, most notably the Waterberg Biosphere Reserve. These tourism/wildlife attractions affected by the corridors are discussed in more detail in this section (Figure 11 – note that this figure still indicates the original corridors as assessed in the first SEIA Draft Scoping Report). The proposed substation sites are not located on nature reserves.

Corridor 1: The corridor potentially affects a number of key points, which includes passing through the middle of the D'Nyala Nature Reserve, the northern tip of the Lapalala Nature Reserve, passing through the middle of the Touchstone Nature Reserve, and then between Touchstone Nature Reserve and Moepel Farms. Lapalala Nature Reserve, Touchstone Nature Reserve, and Moepel Farms form part of the Waterberg Biosphere Reserve.

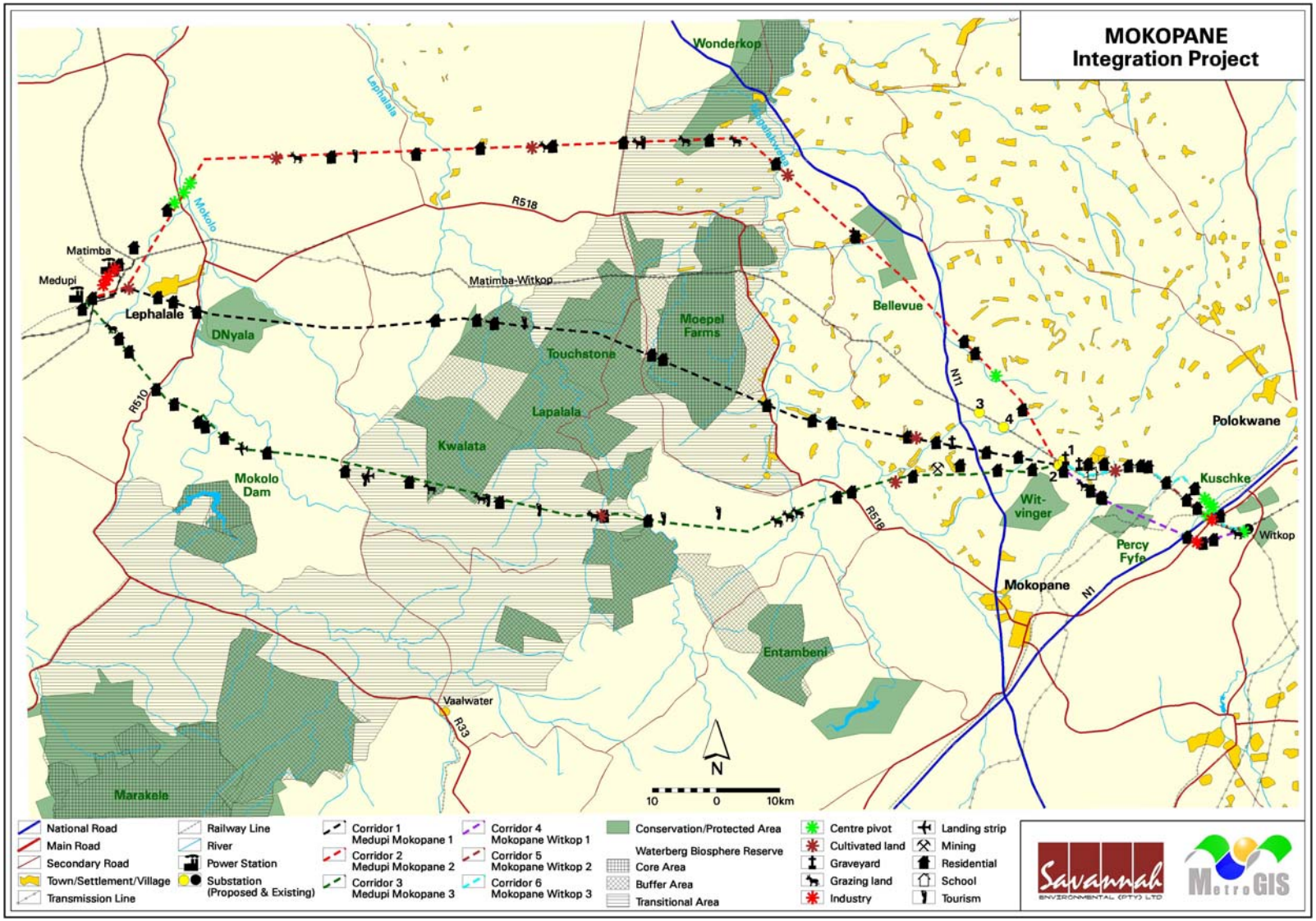
- **Waterberg Biosphere Reserve**

Biosphere reserves are protected environments, which combine both conservation and the sustainable use of natural resources. Usually a biosphere reserve is a community driven programme, often through the assistance of government agencies.

The Waterberg Biosphere Reserve was officially established in April 1990 with the aim to maximise the Waterberg area's potential for conservation, sustainable development and social upliftment. A key aspect in the formation of the Biosphere was the formation of partnerships amongst all the stakeholders who share the area, ranging from privately owned reserves and game farms, to tribal and state owned areas such as Moepel farms. This reserve received international status from the United Nations' Education, Scientific and Cultural Organisation (UNESCO) for their inter-disciplinary biosphere programme. Following recognition by UNESCO was awarded international status in 2001 as the first savannah biosphere reserve in southern Africa (Limpopo Tourism and Parks).

The Waterberg Biosphere in essence is to enhance the development of the eco-tourism industry, in line with the international definition of eco-tourism according to which eco-tourism is not only experiencing nature or participate in hunting activities, it includes diverse community activities and cultures of a country's inhabitants as well as its sensitive natural resources. The key here is that local communities are included in the activities of the reserve/park, and many jobs are afforded.

***Figure 11**: Overview of Nature Reserves in the Study Area*



The total reserve is approximately 14 500km^2, with an estimated 6 people per km^2. The area was mostly characterised by cattle and crop farming, but during the past 15 years there has been a gradual shift in land use to that of conservation and the sustainable use of wildlife ranging from tourism and eco-tourism to hunting.

The biosphere has four zones (Figure 7):

- Conservation/protected areas.
- Core area(s): these areas have secured loyal protection and only activities, which do not adversely affect natural processes and wildlife, are allowed. The core areas which involve the rural communities are Masebe Nature Reserve., Wonderkop Nature Reserves. and the Moepel farms.
- Buffer zones: these areas adjoin or surround the core area, and activities are managed to help protect the core.
- Transition zones: these zones are the outer most part, which typically surrounds the core and buffer zones, and are also known as “zones of co-operation”, where land use, such as farms and urban areas are found.

The area will be further developed in future and will include role-players such as private landowners, the tourism sector, government departments, traditional leaders and representatives of the 26 rural villages in the area. Plans are to link Atherstone, Thabo Tholo and Rhino Bushveld Park up with the Biosphere.

It is possible to change the zonation pattern in future. However, due to the vast area and the large number of role players that need to be included in such a process, the present zonation of the Biosphere will be retained for the immediate future.

- **D’Nyala Game Reserve**

The D’Nyala Game Reserve is 8 281ha in size and is located approximately 15km southeast of Lephalale. Several game species can be found here, including the nyala antelope, and other mammal species such as white rhino, giraffe, waterbuck, zebra, tsessebe and eland. Apart from the mammal species, the reserve is also home to a variety of predators including leopard, brown hyena jackal and other smaller cats. Tourists are accommodated here.

- **Lapalala Nature Reserve**

The Lapalala Nature Reserve (also known as the Lapalala Wilderness) is approximately 36 000ha in extent and houses species such as white and black rhino, buffalo, crocodile, leopard, baboons and a variety of antelopes. Very little development has taken place within the reserve as they aim to retain the land in its natural state as part of their ecological mission to conserve and maintain the biodiversity of the reserve.

Although the reserve is closed for tourism at the moment, the Lapalala Wilderness School is still active. The school was founded more than 20 years ago and offers environmental education to school children. The school has furthermore embarked on youth development initiatives in association with other organisations such as *Love Life* and *Outward Bound South Africa*. A new collaboration has been established with tertiary institutions with the aim to develop the school as a research facility.

- **Touchstone Nature Reserve**

The reserve incorporates the Waterberg Nature Conservancy, the protected areas of Masebe Nature Reserve, Moepel Farms, Mokolo Dam, Marakele National Park and the Nylsvley Nature Reserve, as well as several private reserves such as Lapalala Wilderness, Touchstone Game Ranch, Kwalata, Keta and Welgevonden Private Game Reserve.

The Touchstone Nature Reserve is a natural heritage site and covers an area of approximately 9 000ha in extent. The reserve is home to over 90 game species including white rhino, elephant, buffalo, lion, leopard, antelopes, and the black impala. The reserve mostly offers game drives guided by professional field guides.

- **Moepel Farms**

Moepel Farms consist of a number of freehold farms, which is inhabited by previously disadvantaged communities. These communities mostly busy themselves with cattle farming, but some subsistence crop farming also takes place in the area. The “Moepel Farms Development Initiative” is spearheaded by the Limpopo Department of Economic Development, Environment and Tourism and involves 28 330ha of land. According to the Annual Report (2006/07) of the Commission on Restitution of Land Rights, the aim of the initiative is to develop Moepel Farms as a nature reserve to conserve the wilderness of the area whilst at the same time creating employment opportunities for the local communities, including the Motse community. Several claimant communities will contribute some of their land towards the initiative.

Corridor 2: The corridor traverses the southern tips of Wonderkop and Bellevue Nature Reserves.

Corridor 3: Potential key points affected by this corridor include the Kwalata Nature Reserve, and the northern portion of Witvinger Reserve.

- **Kwalata Nature Reserve**

Kwalata Nature Reserve is approximately 900ha in extent and is also situated within the Waterberg Biosphere Reserve. Kwalata has an abundance of game, including eland, impala, waterbuck, zebra, blue wildebeest and other species such as nyala and tsessebe. The reserve also houses over 270 bird species. Kwalata offers hunting safaris and have agents in the USA as well as other European countries who act as booking agents for international tourists.

- **Witvinger Reserve**

This reserve is approximately 4 450ha in size and is situated between Mokopane and Polokwane. Some of the game species include bushbuck, kudu, reedbuck, tsessebe, leopard and zebras. A study that was undertaken by Seaton Thompson and Associates during 2004 stated that it was not envisaged that the reserve would be developed to include any tourism related activities within the foreseeable future.

- **Shayamanzi Red Leopards Project**

This project aims to save leopards, and takes place on Tambotiesfontein 624, Houtkloof 620, Uitvlugt 619, Voorstandsfontein 622, Klipkraal 621, and Schurbankshoek 658.

Corridor 4: This corridor cuts through the middle of the Percy Fyfe Nature Reserve.

- **Percy Fyfe Nature Reserve**

The Percy Fyfe Nature Reserve is a provincial nature reserve and is situated approximately 35km northeast of Polokwane between Mokopane and Polokwane. The reserve functions primarily as a conservancy in the form of a breeding ranch for roan antelopes and disease-free buffalo. Tourism related activities include camping, game viewing, a one-day hiking trial as well as a mountain bike trial.

Both **corridors 5, 6** and **7** do not pass through nature reserves.

3.1.11Current and future developments in reserves with the project

A change in land use by establishing a transmission power line may be against the goals and purpose of reserves in the area. Biosphere reserves are protected terrestrial and coastal environments of international conservation importance.

- They are unique categories of protected areas combining both conservation and sustainable use of natural resources.

- Biosphere reserves can be seen as building blocks for bio-regional planning and economic development.
- Biosphere reserves are community driven programmes assisted by government agencies.

Each biosphere is intended to fulfil basic functions, which are complementary and mutually reinforcing. Those are:

- A conservation function in terms of biodiversity including landscapes, eco-systems, species and game.
- A logistical function to foster support for research.

According to South African EIA Regulations, sensitive geographic areas and environmental sites include the core area of biosphere reserves as well as (amongst others) nature conservation areas, areas which harbour endemic/vulnerable/protected /endangered species, areas protected by legislation or identified by any policy or plan for the conservation of biological diversity, water resources, landscape or geological features, and archaeological, palaeontological, architectural or cultural sites.

In general, nature reserves also have a conservation function in terms of biodiversity including landscapes, eco-systems, species and game.

In light of the function and importance of biosphere and nature reserves, a set of principles should be applied in the selection of a preferred corridor.

Principles:

Transitional areas in the biosphere reserve should be the preferred areas for transmission power lines.

The conservation zones in the biosphere reserve should be avoided altogether, and where a proposed corridor crosses these zones, the corridor should be aligned to skirt these zones.

Core zones followed by buffer zones in the biosphere reserve should be avoided.

Power lines should rather affect game farms and nature reserves as opposed to the biosphere area – with consideration of principles applicable to mitigate potential impacts on game farming activities (3.1.5).

3.1.12Preferred corridors considering current and future nature reserve developments

Considering the lack of compatibility of a power line with the function of a biosphere, corridor 2 followed by corridor 3 is preferred. Corridor 1 is not preferred as it passes through conservation zones. Corridor 2 passes through a transitional area and skirts a conservation area. Corridor 3 passes through a transitional area, skirts a conservation area, and passes between two conservation areas. Corridors 5 or 6 are preferred due to its distance from Percy Fyfe Nature Reserve. Corridors 5 and 6 are mostly used for grazing of cattle.

Infrastructure

3.1.13Current and future infrastructure development without the project

Corridor 1 exits the Medupi Power Station to the north east between Onverwacht and Maropong, cuts north of Lephalale, and then continues in a mostly easterly direction to the proposed Mokopane substation. This corridor is located to the south of the existing Matimba-Witkop transmission power lines – at its closest point (near the proposed Mokopane substation) there is a distance of approximately 800m between corridor 1 and Matimba-Witkop, and at its furthers point, there is a distance of approximately 18.2km. Before crossing the N11, the corridor joins corridor 3.

Corridor 2 also exits the Medupi Power Station to the north east between Onverwacht and Maropong, but then turns northwards, north of the R518. Approximately 6.5km after the corridor passed over the Landloop River; it turns eastwards and continues east to a point approximately 7.5km west of the N11, where the corridor turns southeast. The corridor crosses the N11 and enters the proposed Mokopane substation to the north.

Corridor 3 exits the Medupi power station to the southeast and continues in a south-easterly direction up to the Tholo Game Ranch, where it turns slightly more eastwards. The corridor crosses the N11 after which it enters the proposed Mokopane substation from the west.

All these proposed corridors will have to cross a number of lines upon exiting the Medupi Power Station as well as a railway line.

The Delta substation and related lines, including the Dinaledi-Marang Transmission power lines, are planned to be built in the area

Corridor 4 is proposed to exit the proposed Mokopane substation to the southeast. The corridor continues in a south-easterly direction up to Turfontein, after which it turns and continues eastwards up to where it terminates at the existing Witkop substation.

Both **corridor 5** and **corridor 6** follow existing transmission power lines. Both corridors exit the proposed Mokopane substation to the east, turns south-east along the existing transmission power line, then east before turn southeast again. **Corridor 6** makes an almost 90° bend, whereas **corridor 5** continues in a south-easterly direction. The two corridors meet up southeast of the N1 and then enter the existing Witkop substation from the west.

Corridor 7 exits north-east of the proposed Delta substation, and turns east towards the Medupi power station, at a point approximately halfway between the substation and the power station.

3.1.14Current and future infrastructure development with the project

The proposed line would not negatively affect road infrastructure. A concern is the corridor of power lines the proposed lines would have to cross at Medupi Power station, and the potential cumulative impacts (health, safety, economic) should lines in this corridor be rendered ineffective e.g. as a result of an accident. However, the crossing of these lines seemed to be unavoidable.

Following an existing infrastructure, e.g. road reserve/power line servitude, would decrease the total number of people in the study area that would be affected by construction and maintenance activities.

From Medupi Power Station, the Dinaledi-Marang lines go south. Corridor 3 might be in the vicinity of the proposed Dinaledi-Marang power lines for a short distance, and should this be the case potential cumulative impacts will have to be considered. Similarly, the routes of the proposed 400kV lines going north from the proposed Delta substation would have to be confirmed to assess potential cumulative impacts (if any).

Railway lines should preferably be crossed at a 90 degree angle, and where power lines follow railway lines, the power line should not be in the rail servitude due to potential electric interference.

Principles:

In light of discussions in this section, it seems that situating a transmission line close to existing infrastructure such as roads is preferable as the number of people who might be affected would be reduced.

The decision to follow existing power lines should be informed by the potential cumulative impacts that will be affected.

Railway lines should be crossed rather than followed.

3.1.15 Preferred corridor considering infrastructure development

In terms of infrastructure principles, no preferred corridor was identified. None of the corridors followed existing infrastructure for significant distances, and the cumulative impacts of following existing lines have to be considered in order to make the decision to follow existing lines.

3.1.16 Information gaps

To fully assess the potential impacts as a result of geographical change processes, more information is needed on the following aspects:

- The size and number of expected construction and operational vehicles and machinery as well as which route(s) will be used to gain access to the various sites;
- Construction activities on site;
- Planned developments for the area in terms of tourism, mining and agriculture;
- Confirm location of landing strips;
- Confirm land use of affected farm portions;
- Confirm location of centre pivots;
- Confirm location of dwellings/structures;
- Confirm the routes of the proposed Dinaledi-Marang transmission power lines, and the location of the proposed Delta substation and its related power lines.

3.1.17 Recommended studies

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Request information from the project proponent, and obtain information from the relevant specialist conducting the traffic impact assessment, if any;
- Further scrutinise the IDP and SDF of the affected district and local municipalities. If additional information is required other than that contained in the IDP/SDF, conduct interview(s) with relevant town planners and tourism bodies.
- Ground truth information on landing strips, dwellings, etc. by conducting participant rural appraisal, including one on one interviews and/or focus group discussions with affected landowners.

- Identify and assess other relevant studies.

3.2 Demographic Processes

Demographic processes relate to the number and composition of people.

3.2.1 Current and future demographic change processes without the project

The Mogalakwena Local Municipality in its IDP (2008/09) states that the many people within the municipal area live in remote farming areas. The population size further changes seasonally as a result of migratory workers either entering or leaving the area. The population size was estimated to be 298 440 in 2007 (Community Survey). The annual population growth rate within the municipal area is estimated at approximately 1.4%, which is more or less on par with the provincial population growth rate.

According to the Community Survey 2007, the total population of Lephalale Municipality was estimated at approximately 80 141 people, which is less than a third of Mogalakwena Local Municipality that has a population of approximately 330 649 people. Of the 80 141 people in Lephalale, about 3% (or approximately 2 400 people) live in Lephalale Town itself, an indication that many people within the municipal area live in remote farming areas.

The IDP of Lephalale LM (2008/09) envisaged that the total population for Lephalale Municipality would increase from 80 141 to 106 521 in 2010. The estimated future population of Lephalale Municipality would increase with approximately 6 500 people over the next 6 years (from 2007). This estimate took into account the 2001 census data and calculations done by the Bureau for Market Research. It was estimated that the population growth rate for Lephalale Municipality will decrease from approximately 1.345% in the year 2004 to 1.024% in the year 2010.

However the calculation of growth rates for future population estimates for areas may change more drastically in years to come due to factors such as HIV/AIDS and migration. Migration is occurring as a result of the construction of the Medupi Power Station, and yet more job seekers and workers can be expected for the construction of the proposed Delta substation and related power lines. The Grootegeluk mine has plans for expansion, and other mining companies might start mining in the area in the near future, which will contribute to an increase in population numbers. Cross boundary migration from other provinces and internationally, e.g. Botswana, can be expected.

According to the Polokwane Local Municipality's IDP (2008-2011), the area is home to approximately 561 770 people (2007). This means that this local municipal area houses more than 10% of the province's total population, even though the area only accounts for approximately 3% of the province's total land surface. The IDP further states that the outskirts of the municipal area is characterised by less formal settlement and that these areas experience enormous influx of people as a result of urbanisation trends. This has resulted in the fact that these areas are in dire need of upgraded services and as such, are struggling to cope with the ever increasing influx of more people expecting an improved quality and standard of living.

3.2.2 Expected Demographic change processes

The construction and operation of the proposed Mokopane Integration project will lead to a change in the number and composition of the population within the affected areas, which may impact on health, safety and community cohesion. These impacts are discussed in more detail in the socio-cultural section.

The most significant demographic changes will occur during construction, when an influx of job seekers and worker may be expected. Changes are also expected during operation, when an influx of maintenance workers can be expected. Although maintenance workers already active in the area will maintain the proposed lines, their activities may affect landowners who are not currently affected by maintenance activities.

It is not expected that relocation will lead to significant demographic changes, as people will mostly be relocated to areas within the project area.

3.2.3 Preferred corridors and substation site considering demographic change processes

It is not expected that the changes and potential impacts will differ significantly between the alternative proposed corridors and substation sites, and preferred corridors and a substation site are therefore not be selected considering demographic change processes.

3.2.4 Information gaps

To fully assess the potential impacts as a result of demographic change processes, more information is needed on the following aspects:

- Statistical demographic data on the various settlements, towns, landowners and workers along the proposed corridor(s) and adjacent to the sites;
- Current crime rate and nature of crimes committed in the area;

- An understanding of local residents' viewpoint on the proposed project and the potential risk for conflict and other forms of active and passive social mobilisation;
- The construction processes and associated timeframes;
- The composition of the construction workforces in terms of size, skills levels, and origin;
- The composition of the maintenance workforce and their activities;
- The number of local employment opportunities;
- The expectations of the local communities in terms of employment opportunities;
- Other projects in the area, their timeframes and work force size as well as location of construction camps; and
- The nature and extend of social problems experienced in the municipalities as a result of an influx of job seekers and employees.

3.2.5 Recommended studies

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Conduct a comparative desktop study between Census 2001 and Community Survey 2007 data;
- Request construction and maintenance information from the project proponent;
- Consult the Comments and Responses Report and interview the public participation consultants if necessary;
- Interview the project proponent, other companies and the municipality;
- Conduct interviews/focus group discussions during Participant Rural Appraisal.
- Access crime statistics and interview members of the SAPS if necessary.

3.3 Economic Processes

One of the impacts of land use change processes is socio-economic. For example, Eskom secures a servitude for a Transmission power line within which no structures are allowed, no crops higher than 2-4 metres (depending on the voltage of the line), preferably no sugar cane and centre pivots, and no forestry. Eskom compensates the landowner to mitigate (manage) the loss of income as a result of these land use changes.

3.3.1 Current and future economic change processes without the project

An interview was conducted with the then manager of the tourism department of Lephalale Local Municipality (Bron and Erasmus 2006 and 2007) to determine the contribution of tourism to the local economy. The following points were raised:

- Tourism contributed approximately R44.1 million to the local economy. This local economic investment was largely due to foreign tourists visiting and hunting in the area.
- Eco-tourism was the strongest aspect of their tourism offering in terms of the natural beauty of the area and the wide variety of mountain ranges in the Limpopo Valley.
- The tourism market had developed to a large extend during the past 15 years, which was ascribed to an effective and market oriented marketing strategy.
- As part of the Lephalale tourism plan, the vision was to establish one large area where the Big 5 can be accommodated.
- Approximately 5% of the farms in the area belonged to foreigners, whilst approximately 30% belonged to locals from other provinces.
- The LED (Local Economic Development) Strategy had identified a number of actions that needed to be taken to ensure the optimal utilization of tourism resources that would stimulate the local economy.
- The Marula tree was being investigated as a potential industry because of the fruit's many uses. The large amounts of Marula trees present in the area also created more informal job opportunities.
- The most popular tourist attractions were mostly located towards the south of Lephalale; to the north of Lephalale lay the coal fields.
- According to Nel and Erasmus (2004) the contribution of tourism to the tertiary sector of the Lephalale economy was estimated at 30.2% compared to the 5.5% of the province. This sector was estimated to accommodate 662 workers and through the backward and forward linkages another 1105 jobs in other sectors is indirect linked to the tourism industry. A conclusion was that relative huge opportunities for the retail and service sector existed as a result of leakages of money spent by tourism operators in Gauteng. It was proposed that the reasons for the huge leakages of money to Gauteng be investigated and a strategy be determined to address this matter.

A study conducted by MasterQ Research (2007) amongst 50 landowners who registered as Interested and Affected parties for the Medupi-Dinaledi, Medupi-Marang, and Mmamabula-Delta Projects as per December 2006 revealed the following:

- The average tariff for catered accommodation was R916.88 per person per night and for self-catering accommodation R281.30 per person per night.
- Landowners were investing money to develop their farms. The capital investment in the past three years was estimated at R184.58 million with an average of R5.13 million per landowner and a standard deviation of R32.83 million.
- To hunt an impala cost between R600 and R3 000 with an average of R1 088.89 and a standard deviation of R760.00.
- There were more game farms and international visitors in the 1000ha+ category, but higher occupation rates occurred in the 1000ha- category. The occupation in the 1000ha+ category was on the increase. The bigger farms generated higher incomes.

- It seemed cost intensive to run these establishments, as 0.3 jobs per hectare were created, or three jobs per visitor.
- The gross income per month was estimated at R234.00.
- The average years that an establishment was in operation was estimated at 11 years, with a standard deviation of 8.6 years. These results indicate that the number of game farms in the LP have increased since 1997.
- In terms of crop farming the total hectares across five (4) farms were estimated at approximately 5 300ha, averaging R41.00 income per hectare per month. For cattle farming the total hectares across 13 farms were estimated at approximately 23 467ha, averaging R75.00 income per hectare per month. It seemed as if cattle and crop farming generated a lower income.

Current trends in the area are to develop estates. The Tholo Game Ranch was previously used exclusively for game farming, but in 2008 the reserve was divided into 49 separate stands and is in the process of being developed by Tholo Bush Estate. These full title stands are for sale and would offer the new owner of such a stand a share in the game on the reserve and the common area of approximately 2 000ha. The price of these stands ranges from R495 000 to R895 000, depending on the location of the stand within the reserve. At the time of this study, a total of 10 stands had already been sold.

3.3.2 Economic change processes with the project

As the land on which the substation sites are located are all State-owned, it was assumed that none of these land portions were used for commercial cattle and crop farming and therefore any such activities that take place were assumed to be subsistence farming. The location of site 1 relevant to the cultivated land makes it unlikely that the turn-in lines would cross this area. No tourism facilities were identified in close vicinity of the sites.

Land for agricultural activities will be permanently lost, which will have an economic impact. Broadly, the economic impact is considered similar for the four sites, as grazing seems to occur on all four sites. Grazing would not be severely affected during operation, as the cattle are still able to move around freely under the turn-in lines as well as around the pylons.

Construction:
During construction, direct and indirect employment opportunities will be created. Indirect opportunities include provision of building materials and/or equipment. Other economic opportunities as a result of construction workers transpires through construction workers' use of local enterprises (shops and shebeens) and in formal and informal work opportunities created at the construction camp.

When a construction camp is put up money is also paid towards the landowner. This is seen to hugely benefit the community and landowner. On tribal or municipal land negotiations are done with community leaders who consult with the community regarding the issue. Another opportunity for financial gain is the rental of land for the accommodation of the construction workers and storage of equipment. This will have a positive impact on the community that benefits from it.
Construction workers might be accommodated in the communities in Lephalale town. This will increases the economic benefits of the project to the affected communities. The economic opportunity for the local community is positive, and potential impacts such as pregnancies because of sexual relationships could be prevented to some extent by implementing mitigation measures.

Local community leaders in traditional areas to the east of the study area have requested that this not to be considered as an option, because of these mentioned potential impacts.

Operation:
The job opportunities are mainly during construction. For operation, the job opportunities could be a permanent job for a skilled worker or a contract for bush clearance. Bush clearance will happen in intervals. Bush clearance opportunities might also be limited because the landowner or Eskom might want to do it.

Construction and Operation – Tourism:

The potential economic impacts on tourism as a result of the presence of the transmission power line are assessed within the context of “sense of place.” The concept of sense of place is applicable to tourist areas because people go on holiday for various and different reasons, e.g. to escape, to be entertained, to enjoy nature, to socialise, etc. In choosing a destination the image of the place is being considered, e.g. its authenticity, its offering, its status (Limpopo is marketed as “The Preferred Eco-Tourism Destination”). If expectations are not met, clientele will be lost.

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.

The above is strengthened by the results of a study to determine the value of interior plants to the hotel/tourism industry, in which Evans and Malone (1992) conducted a study at Opryland. The 12 acres of indoor space has approximately 18,000 plants valued at over $1 million. The annual, horticultural budget is approximately $1.2 million. The study attributes several positive impacts to the "greatscapes" -- the unusually high occupancy rate of 85%, numerous awards and continued expansion. Most importantly, the higher rate ($30/night) for those rooms overlooking the gardens and the high occupancy rate of those rooms translate into $7 million in additional room revenue annually.

A survey completed by MasterQ Research (2007) on a previous project of a similar nature, concluded:

- There might be a decrease in international and local visitors with very specific expectations, should Transmission power lines cross game farms. It seemed as if the hunting experience included a natural setting and an appreciation for a pristine natural environment for most hunters. Although research amongst visitors should be conducted to confirm this hypothesis, it was expected that some international tourists come to a game farm in Africa to experience the wilderness. A visible Transmission power line would detract from the experience, and other farms without lines might be preferred. This might impact on job opportunities.

- Not all potential tourists would be lost. Game farms with power lines crossing their property were still in business. In fact, some of these owners reported a 100% occupation in the hunting season. Visitors included international hunters. However, results of depth interviews with game farmers indicated the presence of a power line detracted from the sense of place of a game farm, which had financial implications. Game farmers said that they lost some of their income potential due to the visual impact of the power line on their property, and that it was not easy to mitigate the presence of the line. Game farmers interviewed indicated that it was difficult to quantify the loss in income as a result of the line going through their property. However, they had comments from tourists regarding the negative visual impact of the line.
- The decision whether to hunt on a farm with a power line depended on the hunters' expectations. Hunters might want a wilderness experience, but also a good trophy

and value for money. A game farm with a power line might be given preference should it better fulfil the expectations of the visitor. This did not mean that the strategic placement of the power lines would not be important. The bigger the farm, the easier it would be to manage the farm and hunting safari around the Transmission power line. It would also be more difficult to strategically place lines in flat areas.

- The placement of the line would be crucial to reduce potential socio-economic and socio-cultural impacts. The final recommendations in the Social Impact Assessment would have to be informed by the visual impact assessment.
- Should hunters not book as a result of the line, the money already spent on marketing might proof to have been a waste of money. The game farm owner might have to change his target market once a power line is on his farm. This might involve a new marketing strategy. It will take years to build up a strong customer base in a new segment of the hunter population.
- Not only game farms with power lines would experience the possible loss of visitors, but also the neighbouring game farms. Game farmers might have to divert game routes and roads on their farms to steer hunters clear of the lines. This would have an economic impact.

Ideally, a study needs to be done to determine the loss of livelihood as a result of a line. Such a study should involve a baseline measurement of the situation prior to the construction of the power line, followed by an assessment post the construction of the power line. The assessment should be done over a period of years, and changes in other variables such as marketing etc. should be considered in the assessment. A control group should also be part of the study to assess whether measured changes could be as a result of what was happening in the area, e.g. a decrease in tourism figures was happening in the whole area, and not only on those properties with a power line. The control group should consist of farms with and without a Transmission power line.

International research in the United States of America (http://powerlinefacts .com) estimated an average of a 4.1% decline of property values, with a high of 7.6% as a result of the presence of power lines on such properties.

The above potential negative economic impacts have to be weighed up against the positive economic impact on regional and national level as a result of the operation of the line.

Based on the discussion in this section, certain principles for the selection of a corridor can be derived.

Principles:

Altogether, it would be preferable to select a route that runs parallel to existing roads, railways or power lines, and away from conservation areas/lodges/tourism destinations and their buffer zones. This also presents the advantage in the sense that less land for cultivation/grazing/game farming is lost, and health and safety impacts are managed. The cumulative impact of putting a number of transmission power lines alongside each other on a game farm should be considered. One, two and even three power lines might be acceptable and manageable in certain situations, but a fourth line might tip the scale.

The most preferred alternative would be one that crosses grazing land for cattle, followed by cultivated land where no GPS equipment for cultivation is used. Land used for game, and where GPS equipment is used is least preferred.

Between game farms for hunting and nature reserves, power lines should rather go through game farms. Where game farms may still be able to mitigate the impacts of a line by the hunting experience/trophy they offer, it will be more difficult for nature reserves.

The buffer zone surrounding a core and conservation area in the biosphere should be avoided, as tourists are likely to enter through this zone, and usually other recreation and tourism related economic activities take place in this area. Also, this zone is usually visible from the core area, and care should be taken to lessen the visual impact of the line in this zone.

The transition areas in the biosphere, where land-uses such as farms and urban areas are found, the development function of tourism is fulfilled, and those who have an interest in tourism seek to link conservation, economic development and cultural values. It is preferable that new lines run through these areas.

To mitigate economic impacts, it would be preferable to select a site that will have the least significant visual impact and the least impact on livelihood.

The disadvantages of locating the substation and turn-in lines far from existing settlements would appear to be the fact that it would reduce the probability that construction workers would provide a boost to the informal sector

3.3.3 Preferred corridors and substation site considering economic development

Considering the potential economic impact of the power line, corridors 2 and 3 are nominated as the preferred corridors. Corridor 1 is not at all preferred, because it passes through the conservation area of the biosphere and because of its distance from the existing Matimba-Witkop transmission power lines. The selection between Corridors 2 and 3 will have to be informed by detailed economic information regarding game farms along the corridors. Corridors 5 and 6 are preferred, because of the distance from the Percy Fyfe Nature Reserve, and because they follow existing lines which do not go through game farms. Corridor 7 should preferably follow existing infrastructure to minimise potential economic impacts.

Considering the potential economic impact of the substation sites, more detail about the livelihood activities on the sites is needed. In terms of proximity to settlements to provide a boost to the informal economic sector, site 4 is not preferred. However, the economic boost will occur during construction, which is a short term activity. Considering potential long-term economic impacts as a result of visual impacts, site 4 is preferred. According to the visual scoping assessment, only site 3 could impact tourists, as this site is located in the vicinity of the N11. According to the visual scoping assessment, the preferred site is site 4.

3.3.4 Information gaps

To fully assess the potential impacts as a result of economic change processes, more information is needed on the following aspects:

- Landowners' and visitors' perception on the effect of visible infrastructure at tourist destinations;
- Study area's contribution to the GDP;
- The drop of property values in South Africa as a result of the presence of power lines and a substation;
- The local employment opportunities that will be created, both directly and indirectly;
- The skills levels of people in the study area;
- Number of jobs available and skills levels of these;
- If available, the average period of employment and an outline of a typical salary package for skilled and unskilled labour;
- The input cost of the project;
- The size of farms and the economic activities on farms;
- Attitude toward housing construction workers in communities.

3.3.5 Recommended studies

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Request the necessary information from the project proponent and interview them if necessary;
- Use an input-output model to quantify economic impacts;
- Execute an economic dependency model;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and vulnerable people in the study area (poor, low skilled, poorly educated people, access to services below RDP standard);
- Interview estate agents in the area.

3.4 Empowerment, Institutional and Legal 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 was already mentioned that the presence of construction workers may put additional strain on municipalities, which might impact on health. Institutional and empowerment processes 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.

3.4.1 Current empowerment and participation processes

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 10).

Therefore, in order to expect people to fully participate in a process that might affect their future, people would have to have reached 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 focusing on fulfilling primary or physiological needs.

***Figure 10**: Maslow's Hierarchy of Needs*

Source: www.arrod.co.uk

People who function on a primary (or physiological needs) level 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 focus 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.

3.4.2 Expected empowerment, institutional and legal change processes as a result of the project

In terms of institutional change processes, the disadvantages of locating the site far from existing settlements would appear that it would increase the distance that would have to be traversed by services infrastructure such as electricity supply and sanitation to the site and construction village, notably during construction. Hence, it would increase the burden on local authorities that are required to provide that infrastructure.

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.

A number of issues and concerns were raised with regards to the negotiation process, and these should be addressed to prevent a breakdown in the negotiation process. A breakdown in the negotiation process in terms of land acquisition could severely delay the project and result in an economic impact on both the landowner as well as on Eskom. Issues and concerns raised by the traditional authorities included:

- The need for the line for financial benefit.
- In terms of route selection, the land of white people gets preference over black people.
- Black people should get the same amount as black people for the servitude.
- A once off payment for the servitude is not acceptable, and an annual/monthly payment is expected.
- A commencement fee must be paid.
- The Traditional Authorities should be compensated.
- Alternative land should be offered.
- Eskom tends to select the cheapest option without considering people.
- The construction workers should be introduced to the affected communities and informed about the ways of the communities.
- Ownership of the servitude should be clarified.
- Eskom should not work with the municipality because the municipality does not assist authorities.
- The Traditional Authorities wants benefits such as schools, clinics, post office, hall, technikon/technical college, market.

The results of a study conducted by MasterQ Research (2007) identified the difference amongst landowners in negotiation skills and knowledge as one of the weaknesses in the negotiation process. In addition, it seemed to some stakeholders who partook in the study that landowners with more negotiating power were those with more money. In the negotiations for the Matimba-Witkop Nr. 2 400kV one landowner managed that an existing line was moved to the edge of his land to agree to the construction of the second line. However, this landowner was held responsible for the financial implications of the moving of the line.

The negotiation process is explained below in order to elicit additional issues and concerns from landowners, which will have to be addressed in the EIA Phase. The process is as follows:

- The site position and servitude are finalised before negotiation can start.
- Negotiators determine which properties are affected by the substation and power lines.
- 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 substation site and route for the Transmission power line to be constructed on private or tribal land.
- Eskom draws up an option to buy the affected property. The option indicates that the owner will accept the substation and/or power line on his/her property, subject to conditions to be finalised in the negotiation of the servitude agreement. An option is valid for one year.
- Negotiators from Eskom Land and Rights 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 substation and/or power line to be constructed on their property, the negotiator explains the procedures and conditions to them. In the case of tribal land, a government representative from the Department of Land Affairs has to attend a public meeting with the tribal leaders when negotiations start.
- Once the landowner is in agreement with the servitude location, he/she has to sign the option if he agrees with the servitude location. Special conditions are negotiated and added to the standard option form. In the case of tribal land, before an option is signed, a tribal resolution has to be made regarding Eskom's intention to reach a servitude agreement on the proposed tribal land. If a tribal resolution is reached to grant Eskom the servitude, the Provincial Department of Land Affairs have to certify the decision. The National Department of Land Affairs register the servitude on tribal land.
- Once the site or power line route is confirmed, the agreement will be finalised with the landowner. This agreement will set out the compensation amount, and conditions for the establishment and operation of the substation and/or power lines, and will be site-specific (as different landowners may have different requirements). Compensation payments are made when the substation site and/or power line servitude is registered at the Deeds office.
- Once the construction is complete and the land rehabilitated to the landowner's satisfaction, the landowner signs a 'Final Release' certificate. Until such time, Eskom Transmission remains liable for the condition of the land which was impacted during construction (Eskom might not buy a whole land portion, but only part of a land portion necessary for the site. Construction activities may impact on land outside the borders of the substation site).

- 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 be satisfactory.
- If no agreement can be reached between Eskom and the landowner in terms of negotiation and all other avenues to resolve the issues has been investigated and failed, Eskom can apply for expropriation of the land. A full EIA has to be completed before an application of expropriation can be logged. This is not a preferred option for Eskom. For expropriation, NERSA (National Energy Regulator of South Africa) is called in. The landowner has a chance to state his case. NERSA makes an independent decision whether the land should be expropriated. Expropriation could be refused. A legally binding expropriation process was not in place at the time of writing of this report. The expropriation process is in the process of being gazetted. The applicable Acts are (www.eskom.co.za/eia):
    - The Electricity Regulation Act (Act 4 of 2006), where section 27(1) states that in the event of Eskom being unable to reach an agreement with the landowner that: The State may, in order to facilitate the achievement of the objectives of this Act, expropriate land, or any right in, over or in respect of land, on behalf of a licensee in accordance with section 25 of the Constitution and section 2 of the Expropriation Act, 1975 (Act No. 63 of 1975).
    - Section 25 of the Constitution of South Africa (Act 108 of 1996), states that a property may be expropriated if such an expropriation is:
        - For the greater good of the public at large; and
        - Subject to compensation.
- Compensation should be fair and should create a balance between public interest and that of the affected landowner in respect of:
    - The current use of the property;
    - The history of the property in terms of acquirement and use; and
    - The current market value of the property.
- The Expropriation Act (Act 63 of 1975), subsection 12, stipulates that the compensation amount on any property, excluding properties with registered mineral rights, should be calculated as follows:
    - The amount that the property would have sold for if it was sold on an open market to a willing buyer from a willing seller; and
    - An amount to compensate for any actual financial loss as a direct result of the expropriation.
    - In the case of a registered right on or to a property, excluding registered mineral rights, an amount to compensate for the actual financial loss as a direct result of the expropriation or the obtaining of the right.

3.4.3 Preferred corridors and substation site considering empowerment, institutional and legal change processes

At this stage, it is not expected empowerment, institutional and legal change processes will differ significantly between the alternative proposed corridors. The selection of a preferred corridor should not be influenced by the level of acceptance/rejection of the project by landowners along the corridor.

Considering institutional processes and the potential burden on the municipality for the construction village, site 3 is preferred because of its shorter distance from settlements and the N11, followed by sites 2 and 3.

3.4.4 Information gaps

To fully assess the potential impacts as a result of empowerment and institutional change processes, more information is needed on the following aspects:

- The risk for attitude formation against the project (social mobilisation);
- The settlements' ability to sustain an additional demand on municipal services and/or natural resources;
- The capacity of the affected local municipality to able to supply municipal services to both the construction site as well as the construction village; and
- Existing disaster management plans (if any) for transmission power lines.

3.4.5 Recommended studies

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Obtain the Comments and Responses Report from the public participation consultants to determine the recurrent issues raised from the public's side and how these issues were addressed throughout the process. An analysis of these issues would indicate the risk for social mobilisation;
- Obtain information from the local municipality on the existing capacity to deliver municipal services and to determine the capacity for an additional demand on municipal services;
- Discuss issues and concerns regarding the negotiation process and how these issues should be addressed with the project proponent; and
- Obtain and analyse information on any existing disaster management plans at similar installations. Also obtain information from the local municipality on any existing emergency and health care services (both governmental as well as private) and determine their capacity to handle potential disasters.

3.5 Socio-Cultural Change 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.

3.5.1 Socio-cultural changes without the project

The study area includes the Tribal Authorities: Laka, Shongoane, Seleka, Lekalakala, Bekenburg, Mapela, MokopaneDikgale, Moletsit, Bakone, Maraba and Mashashane Traditional Councils. There was a lack of information about the culture of these parties and the cultural value of the landscape. The significance of this impact is difficult to determine on a prospective basis and are dependent on the demographic profile of these workers, and whether the differences mattered to those involved. For example, if construction workers were from a different cultural background than locals, conflict can be expected should different cultural backgrounds not be 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 communities.

However, a study conducted by MasterQ Research (2007) to provide an evidence based approach for the assessment of social impacts during the construction of high voltage transmission power lines, gave an indication of the changes that can be expected as a result of the project. This study evaluated the social impacts anticipated for the construction of Matimba-Witkop Nr. 2 400kV transmission power line SIA against the actual social impacts experienced, and the findings were supplemented with the actual social changes that were occurring during the construction of the Beta-Delphi 400kV Transmission line. The results are discussed in the next section.

3.5.2 Socio-cultural changes with the project

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.

3.5.3 Cultural changes without the project

The study area includes the Tribal Authorities: Laka, Shongoane, Seleka, Lekalakala, Bekenburg, Mapela, MokopaneDikgale, Moletsit, Bakone, Maraba and Mashashane Traditional Councils. At the time of preparing this report, information about the culture of these parties and the cultural value of the landscape was not available.

3.5.4 Cultural changes with the project

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 these workers, and whether the differences mattered to those involved. For example, if construction workers were from a different cultural background than locals, conflict can be expected should different cultural backgrounds not be 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 communities.

However, a study conducted by MasterQ Research (2007) to provide an evidence-based approach for the assessment of social impacts during the construction of high voltage Transmission power lines, gave an indication of the changes that can be expected as a result of the project. This study evaluated the social impacts anticipated for the construction of Matimba-Witkop Nr. 2 400kV Transmission power line SIA against the actual social impacts experienced, and the findings were supplemented with the actual social changes that were occurring during the construction of the Beta-Delphi 400kV Transmission line. The results are discussed in the next section.

Construction

Behavioural changes

Sexual relationships

According to literature and interviews with representatives from contractors and Eskom (MasterQ Research 2007), sexual relations between construction workers and local individuals are mainly driven by the possibility of financial gain by local women from the more affluent construction workers. In this study (MasterQ Research 2007), it became clear that these sexual relations might be different from traditional sex work where sexual services were exchanged for money. Women from poor communities seemed to engage in transactional sex with construction workers where an exchange of commodities could take place.

Women seemed to visit men at the construction camp or in the local communities in which workers stayed. Representatives from the contractor interviewed indicated that some women stayed in the construction camps even though they were strictly speaking not allowed to. This was said to be allowed as "construction workers work long hours and should be allowed these freedoms".

In both camps visited women were found inside, washing clothes or hanging around barracks. In a discussion with one of the construction workers on site, he said that the girls with whom they have a 'jol' also wash and cook for them. This was confirmed by

one of the women found in the camp who said that she wasn't paid for washing and cooking as she had a relationship with the man she washed and cooked for. In interviews with community members sexual relations between the workers and local women were seen as a natural occurrence and no-one mentioned that these relationships were based on the exchange of money or other benefits.

The impact of sexual relationships between construction workers and women from the community could manifest in children being born after construction has finished. Even though no evidence could be found in this regard, the possibility was confirmed by a number of people interviewed. The councillor interviewed in Sebole, said that the community saw an increase in teenage pregnancies since they had started to welcome construction workers from different projects to stay in their community, and the implication was that construction workers were responsible for these pregnancies.

Alcohol abuse

Alcohol abuse among construction workers seemed to be a problem during construction, especially after workers had received payment. The issues relate to alcohol's effect on behaviour – sometimes causing irresponsible behaviour that could escalate to violence or conflict between individuals or groups – mentioned by stakeholders of both the Matimba-Witkop Nr. 2 400kV and the Beta-Delphi 400kV Transmission power lines.

According to one of the contractor representatives that were interviewed, alcohol abuse had decreased in the last few years. He said that as workers were required to work harder while on site, there was not much time left for workers in which they could allow themselves to drink heavily.

Mental health changes

Control

One of the most prominent issues amongst landowners was how they had lost control over who entered and moved about on their property due to the construction of the Transmission power line (MasterQ Research 2007). Landowners felt that their privacy was invaded with construction and maintenance of the line. A common emotion amongst landowners, according to one interviewee, was: *"You're on my land; I don't have any control over what happens here."* This was confirmed by a number of landowners that were interviewed. For a landowner that valued and cared for his property, the invasion of strangers was difficult. One of the comments made on what this invasion feels like was related as follows: *"Maande lank is daar vreemdelinge wat in jou huis is"* (for months there are strangers in your house).

Safety & security fears

The presence of 'strangers' on their property sparked safety and security fears amongst landowners. This was said within the context of increased violent crimes conducted against farmers in South Africa. Landowners said they wanted to know when Eskom will be on their property. One of the interviewees said that with access to his property during construction, there was a possibility that unwanted people could enter to observe the property making him vulnerable to safety and security risks.

Integration of construction workers in local communities

Relationships between construction workers and local communities in the construction of the Matimba-Witkop Nr. 2 400kV Transmission power line were good according to all parties interviewed. Where conflict was experienced between construction workers from outside and the local communities it seemed to be largely sparked by the use of alcohol. The difference in income between these groups was also cited as an additional source of conflict.

Cultural landscape changes

Changes in noise, dust, and pollution levels may be experienced as intrusion impacts, which impact on the cultural landscape and sense of place. MasterQ Research results (2007) indicate that the impacts on cultural landscape are considered to be:

- Littering. One (1) landowner discovered cans and remains from construction on his land. Other complaints regarding littering were reported in site meeting minutes.
- Some construction activities were noisy. While some (2) landowners reported that the noise bothered and irritated them, others did not have a problem with the noise caused by construction activities. Noise originated from chainsaws, drill machines and bulldozers on site. Helicopters along the line also bothered a landowner. Noise was also said to upset cattle and game. A landowner who partook in the public participation process for the project discussed in this report commented that helicopters stressed out game.
- Dust on roads due to vehicular movement. One (1) landowner complained about the prevalence of dust during construction.

Operation:

Changes in the landscape may impact on the cultural landscape. Cultural landscape includes tangible and intangible things, and is the way in which perceptions, beliefs, stories and practices give shape, form and meaning to landscape. Landscape is experienced through what we already know, and how we prefer to know things. For some it might be the visual elements of a setting as they have seen it on a photo, for others what they hear at a conference, for others what they smell. These differences have a profound influence on the ways that people experience places.

Research results conducted by MasterQ Research (2007) for the Mmamabula-Delta Project in Lephalale indicated that the bushveld setting in itself seemed to be a unique cultural setting, where some activities very specific to the South African culture took place: braai, hunting, sitting around a fire place. For tourists, this behaviour and the environment within which it took place will become part of the Africa setting because meaning and value are attached to the appearance of the landscape – the landscape allowed for specific behaviour. A Transmission power line might detract from the experience because it does not fulfil expectations, albeit on a tacit level.

Principles:
It seems preferable to locate the site and corridors away from any towns or villages, as this could reduce the probability that the project would interfere with people's daily movement patterns, impact on their safety and health, and affect their quality of life as a result of nuisance impacts (noise, dust).

3.5.5 Preferred corridors and substation site considering socio-cultural change processes

Considering the potential socio-cultural impacts, the site 3 is closest to settlements, followed by sites 1 and 2. Site 4 is the preferred site, not taking into account potential impacts on cultural landscape during operation.

In terms of a preferred corridor, all the corridors pass a similar number of settlements and more information is needed to select preferred corridors.

3.5.6 Information gaps

To fully assess the potential impacts as a result of socio-cultural change processes, more information is needed on the following aspects:

- The construction process;
- The profile of a typical construction worker;
- Local employment creation and expectations;
- Local employment possibilities;
- Expected population influx;
- Origin of construction workers;
- A health profile of the local community (if available), including HIV prevalence;
- The potential visual impact of the proposed project; and
- The prevalent culture.

3.5.7 Recommended studies

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Request information form the project proponent;
- Assess the visual assessment report;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and communities in the study area;
- Conduct a desk top study to determine the health profile of the area; and
- Interviews with municipal officials and other authority figures (such as the South African Police Service).

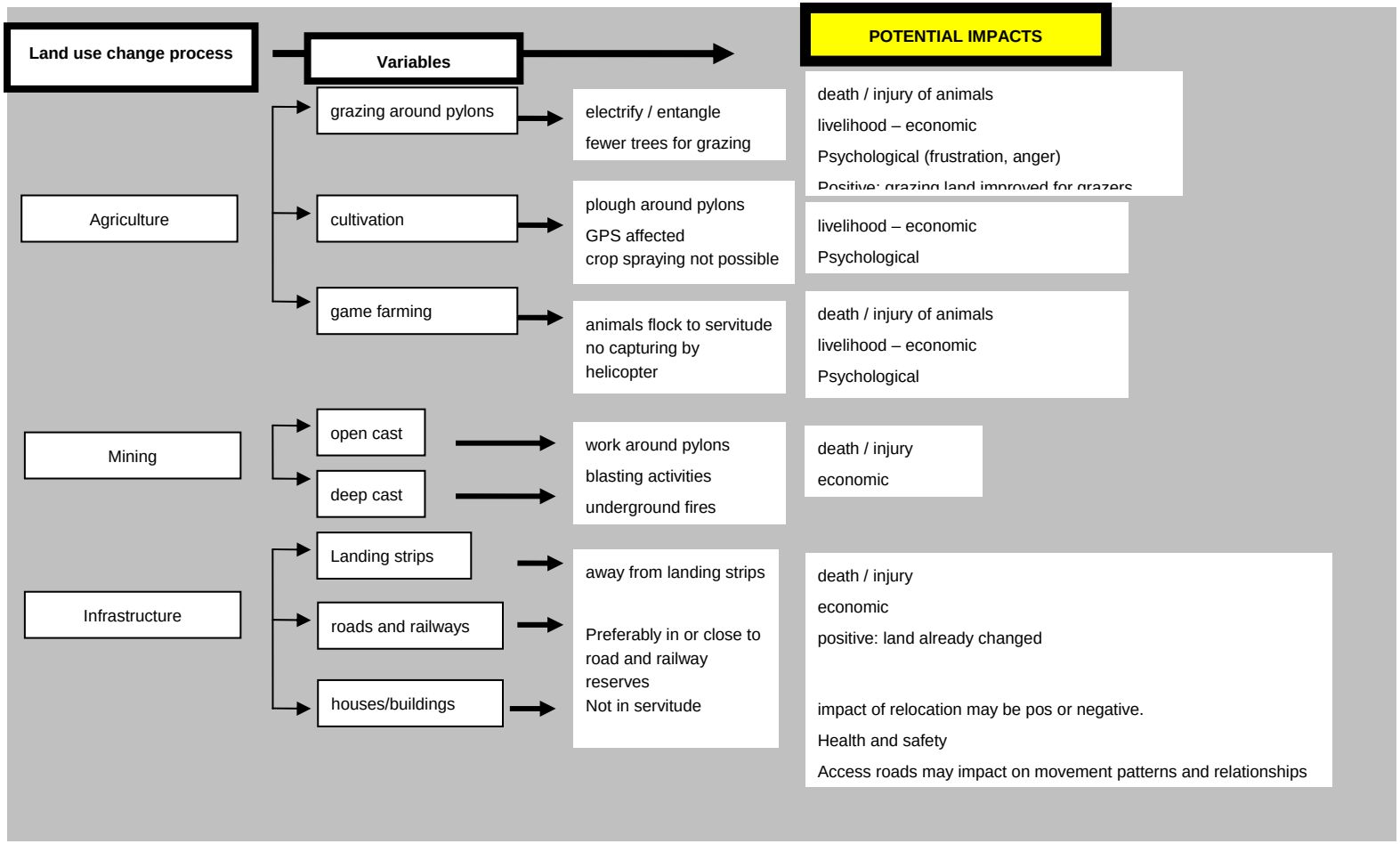
4. SUMMARY

To summarise, the change processes and potential impacts of power lines and a substation are **tabled** and **visually** presented in this section.

***Table 1**: Overview of Expected Geographical Change Processes and Potential Impacts of a Substation*

GEOGRAPHICAL CHANGE PROCESSES			
Change Process Variable	**Potential Impact**	**Project Phase**	**Status**
Cultivated and grazing land	Temporary loss of cultivated and grazing land due to construction activities, leads to a decreased area for cultivation and grazing, resulting in an economic impact. Also permanent loss of cultivated and grazing land through the land acquisition process during operation.	Construction and Operation	Negative
Spatial development (future land use)	Developments may encroach upon the substation which may impact on health and safety. People who move into the servitudes of the power lines and of the substation will have to be moved.	Operation	Negative

***Figure 10**: Overview of Expected **Geographical Change Processes** and Potential Impacts of a Power line*



what is happening?

Eskom wants to come to your area to put up power lines to bring more electricity to South Africa.

When they come here to build and put up these lines, they will bring changes to the area.

Some of these changes could be:

- **changes in job opportunities**
- **other people (strangers) staying in your area**
- **more people using your land and services**
- **more money coming into your area**
- **changes in the land, the soil, air and water quality.**

DEFINITIONS:

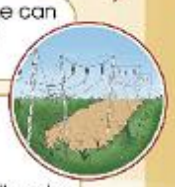
- **pylon:** this is the type of pylon that will mostly be used in your area.

- **servitude:** the strip of land where the line is. Eskom has permission to work in the servitude.

CHANGE PROCESSES

- **your health and safety** (other people in the area, what they do)
- **changes in how you live** (e.g. job opportunities)
- **land use** (how the land can be used)

land use			impacts	now what?
agriculture	cultivation	- difficult to plough around pylons - crop spraying is difficult	**good:** grazing and crop cultivation can happen in the servitude. **bad:** farmers lose part of their land where the pylons are, it is sometimes difficult to work on the land in this area. It is dangerous for helicopters to fly close to a power line. construction and maintenance workers can leave gates open and animals get lost.	• animals must be kept away from construction areas. • pylons should preferably be on the edge of the farm. • Eskom must talk to land owners about the best land use.
	grazing around pylons	cattle / game can graze under the lines		
	game farming	difficult and dangerous capturing game by helicopter		
mining	open cast underground	- work around pylons - blasting activities - underground fires	**bad:** mining cannot take place close to the pylons, it is dangerous and the pylons can fall down. **good:** your safety comes first	• Eskom should talk to mining companies to see where the mining areas are. • pylons should be placed away from mining areas.
infrastructure	landing strips roads and railways	pylons not allowed in road, railway and landing strip servitude	**good:** placing lines close to infrastructure makes it easier to access the servitude and lines for maintenance. **bad:** having pylons too close to landing strips and roads and railways could be dangerous and are not allowed.	• pylons should not be placed in landing strip, road and railway servitudes.



Mokopane Integration - Community Impact Assessment land use

Ke eng seo se diragalang?

Eskom ba ka rata go tla mo lefelong la lona, ba age megala ya motlakase gore ditshono tsa go ka bona motlakase mo Afrika Borwa di oketsege.

Fa ba simmolla go aga megala e, go tla nna le diphetogo di se dikae.

Some of these changes could be:
- **changes in job opportunities**
- **other people (strangers) staying in your area**
- **more people using your land and services**
- **more money coming into your area**
- **changes in the land, the soil, air and water quality.**

Ditlhaloso tsa mantswe:
- pylon: this is the type of pylon that will mostly be used in your area.

- lefatshe la tlro: lefatshe le go tlang go agiwa mo go lone. Eskom has permission to work in the servitude.

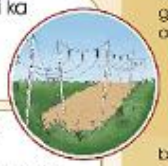
DIPHETOGO TSE DIKA BONWANG

- **mphelo le tshireletso ya gago**
(seo botho ba bangwe ba se dirang)
- **diphetogo tsa botshelo jwa gago**
(methala: ditshono tsa ditiro)
- **tiriso ya lefatshe**
(kammo lefatshe le ka diriswago ka gona)

tiriso ya lefatshe

tsa temo

- go jala → - go nna thata go lema fa pele ga megala ya metlakase
  - go nna thata go tshela dilo tse di siametseng dijalo (dikhemikhale)
- go fula ka fa tlase ga megala → diphologolo di ka nna tasa fula ka fa tlase ga megala



- go lebelela diphologolo tsa naga → go thata e bile go kotsi go ka tsoma diphologolo ka helikoptara

dimaene

- mafelo a bulegileng
- ka fa tlase ga lefatshe → - dira go dikologa megala ya motlakase
  - dibomo
  - molelo wa fa tlase ga lefatshe

ditlhelo

- lefelo fao dihelikoptara di emago gona
- mmila ya dikoloi le diterene → megala ya motlakase ga e a dumelwa go nna felo fao go agilweng ditsela, diporo le fao dihelikoptara di emago gona

ditlamorago

tse dintle:
go tula le go jala go ka tswelela pele fa lifelong leo go agilweng fa go lona.

tse di maswe:
bakami ba ka lathegelwa ke karolo e ningwe ya lefatshe la bona. Naka e ningwe go thata go dira mo lefatshong leo go agilweng fa go lona.

go kotsi go ka bona di helikoptara di fofa gaufi le megala ya motlakase.

badiri le batlhokomedi ba tiro ba ka tlogela dikgoro tsa diphologolo di butswe ka dhoso. Se se ka dira gore diphologolo di lathege

tse di maswe:
dimaene di ka se nne gaufi le megala ya motlakase. Se se kotsi mme megala e ka wela fa fatshe

tse dintle:
tshireletso ya gago e tla pele.

tse dintle:
go beya megala fa pele ga ditirelo, go dira tiro ya go aga megala e be bonolo, le go ka e tlhokomela

tse di maswe:
go nna le megala ya motlakase fa pele ga ditsela le sepoko go ka nna kotsi mme ga gowa dumelwa.

jaanong ge?

- diphologolo di tshwanela ke go bewa kgakala le mafelo a go agilweng me gale ya metlaksea.
- go ka nna botoka thata ge megala ya metlakase e ka nna ko bofelong jwa ditshimo.
- Eskom ba tshwanela ke go buisana le bong ba lefatshe, ka mokgwa oo lefatshe le tshwanelang go diriswago ka lona.

- Eskom e tshwanela ke go buisana le baditsi ba dimaene, go lebelela kwa dimaene di leng teng.
- megala ya motlakase e tshwanela ke go bewa kgakala le dimaene.

- megala ya motlakase ga e a tshwanela go ba gaufi le ditsela, sepoko le moo dihelokoptaradi emang teng.

Mokopane Integration - Community Impact Assessment tiriso ya lefatshe

To avoid potential negative impacts on health and safety and of displacement of people as a result of changes in current and future settlement patterns that may be affected by the proposed corridors, the preferred corridors were identified as corridor 3.

To avoid potential negative impacts on agricultural activities as a result of the proposed transmission power line, the preferred corridors were corridors 2 and 4.

Considering the potential affect of mining activities in the vicinity of a power line, the preferred corridors were corridors 1 and 2, and corridors 4 or 5 or 6.

Considering the lack of compatibility of a power line with the function of a biosphere and the number of reserves along corridors, corridor 2 followed by corridor 3 was preferred. Corridors 5 and 6 were preferred to Corridor 4.

In terms of infrastructure, a preferred corridor was not identified.

Considering the potential affect on settlement patterns and development (current and future) in selecting a preferred substation site, the following emerged:

- In terms of access roads, there was no preferred site.
- Site 3 is closest to settlements, followed by sites 1 and 2. In terms of potential health and safety impacts, site 4 was preferred.
- Transmission power line corridors not following the existing Matimba-Witkop transmission power lines and entering and exiting sites 1 and 2 would potentially affect more settlements.
- Considering proposed transmission power lines going to sites 3 and 4, it would be possible to avoid settlements and not affect their development.

To avoid potential negative impacts on health and safety and settlements developments, the preferred site was site 4.

Considering the potential effect of the site and the proposed 2x765kV transmission power lines on agricultural activities, sites 2, 3 and 4 were preferred. Site 1 seemed to be more likely to affect cultivation activities on land immediately surrounding the site, and was least preferred. The proposed 2x765kV transmission power lines would follow a longer length of the existing Matimba-Witkop transmission power lines should sites 3 and 4 be selected, and may localise impacts on agricultural activities. Sites 3 and 4 were therefore preferred.

***Table 2**: Overview of Expected **Demographic Change Processes** and Potential Impacts*

DEMOGRAPHIC CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Influx of construction workers	Influx of construction workers will lead to a change in the number and composition of the local population, and impact on economy, health, safety and social well-being.	All	Pre-construction and construction	Negative to neutral
Influx of job seekers	Influx of job seekers will lead to a change in the number and composition of the local population, and impact on economy, health, safety and social well-being.	All	Pre-construction and construction	Negative
Presence of maintenance workers	Although maintenance workers already active in the area will maintain the proposed lines, their activities may affect landowners who are not currently affected by maintenance activities.	All	Operation	Negative to neutral

what is happening?

Eskom wants to come to your area to put up power lines to bring more electricity to South Africa.

When they come here to build and put up these lines, they will bring changes to the area.

DEFINITIONS:

- pylon:

- **servitude:** the strip of land where the line is. Eskom has permission to work in the servitude.
- **construction worker:** cleans the strip under the power line, put up the pylon and string the power lines.
- **maintenance person:** keeps the strip under the power line clean to prevent fire and make sure the power lines are safe.

CHANGE PROCESSES

- **your health and safety**
  (other people in the area, what they do)
- **changes in how you live**
  (e.g. job opportunities)
- **land use**
  (how the land can be used)

your health and safety

impacts

now what?

what construction and maintenance workers do

mixing with local people

resources used at the moment

more people using the same resources

good:
workers might teach local people new skills.

bad:
workers are far from home and could maybe sleep around. This may spread things like HIV/AIDS, sexually transmitted diseases, pregnancies, and other social problems can result.

sometimes crime may increase because of job seekers who did not find jobs.

not enough water and bad hygiene can have a negative impact on health.

- outsiders will be in your area.
- changes will come - be careful what you do for money.
- people should come and teach you more about HIV / AIDS - you need to know how to avoid being infected.

- complain to your municipality if not up to standard: for example if the litter is not properly taken away, if the veld is used for a toilet, if there is not water for cleaning and washing.

what the construction workers do

in the construction village and when building the line

bad:
people living close to a construction site may hear lots of noise for a long time because of the work being done.

- people must come to warn you when there will be noise.
- workers will try to finish before night time so there should be less noise at night.
- workers will try not to work during hunting season.

the power line itself

power lines have electric - and magnetic fields

bad:
power lines are dangerous:
a) it is not safe to climb on the pylons.
b) it is not safe to live in the servitude.

DANGER

- people should come to tell you about the dangers of the line.
- you should not live too close to the lines (in the servitude).
- do not climb a pylon.

Ke eng seo se diragalang?

Eskom ba ka rata go tla mo lefelong la lona, ba age megala ya motlakase gore ditshono tsa go ka bona motlakase mo Afrika Borwa di oketsege.

Fa ba simmolla go aga megala e, go tla nna le diphetogo di se dikae.

Ditlhaloso tsa mantswe:

- pylon:

- **lefatshe la tiro:** lefatshe le go tlang go agiwa mo go lone.
- **modiri wa kontraka:** ke motho yo a phepafatsago lefelo leo go tla go agiwang mo go lone, o tsentsha megala le go ka e kgomogantsa.
- **motlhokomedi wa tiro:** ke motho yo a dirago bonnete ba gore lefatshe leo le diriswago le phepafetse gore dikotsi tsa molo di se bonwe. O dira bonnete gape, gore megala e sireleditswe sentle.

DIPHETOGO TSE DIKA BONWANG

- **mphelo le tshireletso ya gago**
(seo batho ba bangwe ba se dirang)
- **diphetogo tsa botshelo jwa gago**
(methala: ditshono tsa ditiro)
- **tiriso ya lefatshe**
(kammo lefatshe le ka ditswago ka gona)

maphelo le tshireletso ya gago

seo se dirwago ke badiri ba kontraka le batlhokomedi ba tiro → go kopana le batho ba bangwe

diciriswe tsa masepala tse di dirilwang jaanong

batho ba ba dirsang dithiolo tsa masepala ba oketsegile

ditlamorago

tse di nnle:
badiri ba ka ruta badiri ba bangwe bokgoni

tse di maswe:
badiri ba kgakala le magae a bona mme go bonolo gore ba ka amega mo thobalanong. Ses se ka oketsa ditshono tsa malwetse a joalo HIV/AIDS, malwetse a thobalano mo go bona le mogo lona. Se sengwe gape e kanna ga ima go go sa batlegeng le mothata mo serjhaeng.

nako e nngwe bogodu bo ka ara ka ntlha ya gore batho gob aka ba bona ditiro batlhe.

go senne le metsi a mantsi le go se ithokomele sentle go ka tlisa ditlamorago tse di maswe go tsa mapheio a rona.

jaanong ge?

- batswa ntle batla se ba le teng fa lefatsheng la lona.
- diphetogo di tla bat eng-ithokomela gore o dir o eng gore o bone madi.
- batho ba tshwanna go tla go le ruta ka tsa botwetse ba HIV/AIDS gore le kgone go ithokomela kgathanong le botwetse bo.
- itlise masepala wa gago ga dilo di so tsamaye ka tshwanno. O ka itlise masepala wag ago kamatlakala ge a se phutlwa sentle, ge naga e diriswa jaaka ntlwana ya batlhuso kgotsa ge metsi a sa lekane go ka phepafatsa le go tlhatswa ka baka la koketso ya batho bao bawa dirisang.

seo badiri ba se dirang → mo lefelong la kago, le ge ba aga megala

tse di maswe:
batho bao ba ninang gaufi le lefatshe leo go direlwang fa go lone ba ka rasetswa thata ka baka la tlela e e tswellang pele.

- batho ba tla tla go le lemosa ka nako eo lerata le tla nnang teng.
- badi bat la leka go fetsa ka nako, gore ka nako ya bosigo le seke la rasetswa.
- badiri botla leka go se dir ka setlho kgotsa nako ya tsomo.

megala ya metlakase ka bo yone → megala e, ena le dilo tse dikotsi ka fa teng ga yone

DANGER

tse di maswe:
megala ya metlakase e kotsi thata.
a) ga go a babalesega go namela kwa godimo.
b) ga o a tshwanela go nna mo lefelong le go agilweng fa go lone.

- batho botla fa go lo itlise ka g dikotsi tsa megala.
- ga o a tshwanela go nna gaufi le megala ya metlakase (foo megala e agilweng teng).
- o se ke wa palama megala ya metlakase.

It was not expected that relocation would lead to significant demographic changes, as people would mostly be relocated to areas within the project area. It was not expected that the changes and potential impacts due to the influx of job seekers and workers would differ significantly between the alternative proposed corridors, and a preferred corridor and site were therefore not be selected considering demographic change processes.

***Table 2**: Overview of Expected **Economic Change Processes** and Potential Impacts*

ECONOMIC CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Direct formal employment opportunities to local individuals	Direct formal job opportunities for individuals and/or contractors (economic impact).	All	Pre-construction, construction and operation	Positive
Indirect formal and/or informal employment opportunities to local individuals	Indirect formal and/or informal job opportunities for individuals and/or contractors income (economic impact).	All	Pre-construction and construction	Positive
Loss of jobs,	Economic impact as a result of reduction in tourists/hunters.	All – extend to be confirmed by detailed studies	Construction and operation	Negative
Loss of income and output	Economic impact as a result of reduction in tourists/hunters.	All - – extend to be confirmed by detailed studies	Construction and operation	Negative
Reduction in property values	Economic impact as a result of the presence of the line.	All - – extend to be confirmed by detailed studies	Construction and operation	Negative
Benefits (regional and/or national)	Economic impact as a result of the construction and operation of the line – benefits economic growth. Economic impact associated with the payment of compensation (number of properties per alternative and compensation costs).	All	Pre-construction, construction and operation	Positive/Negative

Considering the potential economic impact of the power line, corridors 2 and 3 were nominated as the preferred corridors. Corridor 1 was not at all preferred, the selection between Corridors 2 and 3 would have to be informed by detailed economic information regarding game farms along the corridors. Corridors 5 and 6 were preferred.

Considering the potential economic impact of the substation sites, more detail about the livelihood activities on the sites were needed. In terms of proximity to settlements to provide a boost to the informal economic sector, site 4 was not preferred. However, the economic boost will occur during construction, which is a short term activity. Considering potential long-term economic impacts as a result of visual impacts, site 4 was preferred. According to the visual scoping assessment, only site 3 could impact tourists, as this site is located in the vicinity of the N11. According to the visual scoping assessment, the preferred site was site 4.

what is happening?

Eskom wants to come to your area to put up power lines to bring more electricity to South Africa.

When they come here to build and put up these lines, they will bring changes to the area.

DEFINITIONS:

- pylon: 
- **servitude:** the strip of land where the line is. Eskom has permission to work in the servitude.
- **construction worker:** clears the strip under the power line, put up the pylon and string the power lines.
- **maintenance person:** keeps the strip under the power line clean to prevent fire and make sure the power lines are safe.

CHANGE PROCESSES

- **your health and safety** (other people in the area, what they do)
- **changes in how you live** (e.g. job opportunities)
- **land use** (how the land can be used)

changes in how you live

impacts

now what?

jobs

construction

contractors

contractors may give some jobs like cleaning, security or construction.

good:
you might make money from the job and build a better life.

you might better your skills and you could be happy.

bad:
the job is finished when construction in your area ends, could make you unhappy.

only some people may get jobs.

- only some people may get jobs, there may be no jobs.
- if you don't have the right skills, you will struggle to get a job.
- remember that if you get a job, this work will not last very long.

you

you might provide services like food, accommodation and cleaning.

operation

Eskom must maintain the line and the servitude.

highly skilled people maintain the line.

- look out where you can apply for jobs - speak to your municipality.
- go through the right process.

compensation

given to people who's land falls in the *servitude* - (strip of land where the line is)

good:
some form of payment is given to the person who owns the land.

bad:
if your house is in the servitude, you must move. Children might have to change schools because of relocation.

- if the line crosses your land, somebody from Eskom must come and negotiate with you. Negotiations happens once only.

more electricity

good:
more people in the country will get electricity - good for everyone.

- you may not get electricity soon because they still have to build the small lines after the big ones are finished.

Mokopane Integration

- Community Impact Assessment

changes in how you live

Ke eng seo se diragalang?

Eskom ba ka rata go tla mo lefelong la lona, ba age megala ya motlakase gore ditshono tsa go ka bona motlakase mo Afrika Borwa di oketsege.

Fa ba simmolla go aga megala e, go tla nna le diphetogo di se dikae.

Ditlhaloso tsa mantswe:

- pylon:

- **lefatshe la tiro:** lefatshe le go tlang go agiwa mo go lone.
- **modiri wa kontraka:** ke motho yo a phepafatsago lefelo leo go tla go agiwang mo go lone, o tsentsha megala le go ka e kgomagantsa
- **motlhokomedi wa tiro:** ke motho yo a dirago bonnete ba gore lefatshe leo le diriswago le phepafetse gore dikatsi tsa molao di se bonwe. O dira bonnete gape, gore megala e sireletswe sentle.

DIPHETOGO TSE DIKA BONWANG

- **mphelo le tshireletso ya gago**
  [seo sotho ba bangwe ba se dirang]
- **diphetogo tsa botshelo jwa gago**
  [methala: ditshono tsa ditiro]
- **tiriso ya lefatshe**
  [kammo lefatshe le ka diriswago ka gona]

Diphetogo tsa botshelo jwa gago

ditlamorago

jaanong ge?

ditiro

tiro

badiri ba kontraka

badiri baka fana ka ditiro tsa go ka phepafatsa, go nna mosireletsi kgotsa go thusa ka tiro ya megala

tse dintle:

o ka bona madi gotswa mo tirong eo kae fiwang, mme wa nna le botshelo jo botoka.

o kanna le bokgoni ba go ka dira ditiro tse dingwe mme wa itumela.

- ke bao le bao fela ba tlang go bona ditiro, naka eringwe ditiro di ka senne leng.
- ga o sena bokgoni bo bo tlhokegang, otla nna le mathata ago ka iponna tiro.
- gapola gore tiro eo ka e fiwang gase ya goya go ile.

wena

wena o ka fana ka ditirelo tsa thekiso ya dijo, marobalo le go ka phepafatsa

tse di maswe:

tiro e o e fiweng eo fela ge tiro ya tshentsho ya megala e fitlhile bokgutlang. Se ge se e itumedise.

gase batho bothe batla fiwang ditiro.

- lebelela la o ka bonang tiro gone,ka bokgoni bo o nang le bone- buwa le masepala wa gago.
- dirisa ditsela tse di siameng.

tsamaiso

Eskom le tswanela ke go tlhokomela megala le lefatshe leo go agiwang fa go lona

ke batho baba nang le bokgoni bo bo kwa godimo fela baba tlhokomelang tsamaiso ya tiro yotlhe

tuelo

yona e bonwa ke batho boo lefatshe la bona le tlang go diriswa

tse dintle:

madi a fiwa motho eo lefatshe e leng la gagwe.

tse di maswe:

ga nfilo ya gago ele fa lefatsheng leo go direlwago fa go lone, o tla tswanna ke go tloga o lo nna go gongwe. Bona le bone ba ka tshwanna ke go fetola dikolo ka baka la phuduga e.

- fa megala e tshelela kwa lefatsheng la gago, mongwe gotswa lefapheng la Eskom o tlaela go buisana le wena ka dituelo. Dipuisano tse di dirogala gangwe fela.

motlakase o montsi tota

tse dintle:

batho ao bantsi mo Afrika Borwa ba batla bona motlakase, mme seo e tlaba boitumelo go bothe.

- o ka nna wa se bone motlakase ka tshoganyetso gonne go tlhokega gore ba age megala e e mennye morago ga e metona e agilwe.

***Table 3**: Overview of Expected **Empowerment, Legal and Institutional** Change Processes and Potential Impacts*

EMPOWERMENT AND INSTITUTIONAL CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Attitude formation against the proposed project	Attitude formation against the project could have economic impacts and could impact on social well-being.	All	Pre-construction and construction	Negative
Negotiation process	A breakdown in the negotiation process in terms of land acquisition could severely delay the project and result in an economic impact on both the landowner as well as on Eskom.	All (but depends on ownership)	Pre-construction	Negative to neutral
Additional demand on municipal services	Additional demand on municipal services could impact on the availability of these services. A lack of services could impact on health.	All	Pre-construction and construction	Negative

It was not expected empowerment, institutional and legal change processes would differ significantly between the alternative proposed corridors and sites. The selection of a preferred corridor and site should not be influenced by the level of acceptance/rejection of the project by landowners along the corridor.

Similar to empowerment, institutional and legal change processes, it was not expected that cultural change processes and potential impacts would differ significantly between the alternative proposed corridors and substation sites.

***Table 4**: Overview of Expected **Socio-cultural Change Processes** and Potential Impacts*

EMPOWERMENT AND INSTITUTIONAL CHANGE PROCESSES				
Change Process Variable	**Potential Impacts**	**Corridors Potentially affected**	**Project Phase**	**Status**
Mental health	Presence of construction workers and job seekers on surrounding landowners' sense of safety and security and being in control.	All	Construction	Negative
Behavioural changes – sexual relations and alcohol abuse	Presence of construction workers and job seekers my impact on local people's health and safety	All	Construction	Negative
Integration of construction workers into local areas	Socially acceptable integration, including the risk of spreading STIs and HIV/AIDS with an impact on health.	All	Pre-construction and construction	Negative
Cultural landscape	Psycho-social impact of construction activities and the presence of the line.	All	Construction and operation	Negative

Considering institutional processes and the potential burden on the municipality for the construction village, site 3 was preferred because of its shorter distance from settlements and the N11, followed by sites 2 and 3.

In terms of a preferred corridor, all the corridors passed a similar number of settlements and more information was needed to select preferred corridors.

5. CONCLUSIONS

In light of the information in this report, the final selection should be between Corridors 2 and 3, and 5 and 6. In light of mining activities along corridor 3, which do not seem to be avoidable, corridors 2 should get preference. However, in light of lack of detailed economic information along these two corridors, it is recommended that both these corridors be assessed in the EIA Phase of the project. Corridors 5 and 6 will have to be studied in more detail to determine the difference in significance of impacts of land use and demographic processes.

No fatal flaws are present. Corridor 1 going through the core areas of the biosphere is a serious concern due to the fact that these reserves are protected environments of international conservation importance. Also, the potential cumulative impacts of 4 (four) transmission power lines going through an area which mainly seem to consist of game farms, is a concern.

In selecting a final route the following principles should apply:

- Loss of browsing for browsers (in the form of trees within the servitude) would be a significant land use change because the area consisted of a high number of game farms and nature reserves with game.
- There was a concern that the presence of power lines might affect the tourism numbers negatively, resulting in financial loss. Research results (MasterQ Research, 2007) indicated that it was possible to carry on with game farm related activities in the presence of power lines, although the presence of lines did detract from the experience of visitors, and international visitor numbers might decrease. It seemed as if the number of power lines, the placement of power lines and the size of farms were important considerations for placement of the lines in order to reduce the potential economic impact of the line on the affected properties. Eskom would want scientific proof that a reduction in tourist numbers was as a result of the lines and not other factors. Because this is not easy to prove, and it is not possible to avoid game farms altogether in this area, the final route alignment should aim to mitigate potential negative impacts of the lines on the game farms, e.g. going through areas where the visual impact will be best mitigated.
- Where mining does occur, it would be best to put lines as close to mining areas as possible (without compromising safety) to mitigate the potential impact on game farms (land use and economic).
- Situating a transmission line close to existing infrastructure consolidates visual impacts, and therefore reduces the line's impact on sense of place and the cultural landscape for visitors and local inhabitants, potentially mitigating negative economic impacts such as loss of jobs. However, this does not apply to properties with tourism activities which are already affected by power lines, as the potential negative economic impacts may be more significant due to the cumulative impacts of the lines.

- Avoid, where possible, areas where there is no infrastructure (bushveld) to keep the sense of place intact, and attempt to avoid landing strips. The potential impacts of access roads for maintenance will be reduced as existing roads can be used.
- Should game farms not be avoidable, the bigger game farms should rather be targeted in order to mitigate potential negative impacts.
- Eskom would only purchase a property if more than 50% of the property is affected by the power lines. This would not be the case in the study area as most of the properties are very extensive. Lines should therefore rather follow the borders of farms, and not go through the middle of a farm portions. The boundaries of farms should be followed to allow landowners to carry on with their game capturing activities and preserve the landscape of their farm. Following the boundaries of farms will also ensure that landowners could probably avoid these lines when they take guests out on trips.
- Should game farms be affected, lodges and hunting camps should be avoided. The homes of employees are likely to be in close vicinity of these lodges, and their homes will then also be avoided.
- Avoid, where possible, areas where game and bird watching takes place to reduce the impact on tourists' experience. These areas are likely to be watering holes and pans, and vulture restaurants.
- The input from the visual specialist is crucial to ensure that a corridor with the least significant visual impacts is selected.
- Landing strips and centre pivots should be avoided where possible.
- Tourism routes should be avoided where possible.
- It seems preferable to locate the line away from any towns or villages, as this could reduce the probability that the project would interfere with people's daily movement patterns or impact on their safety (more so during construction).
- It would seem preferable to select a route that is as remote as possible from existing settlements. However, in order to obtain a complete view of the social impacts derived from the project, it is also necessary to consider activities and structures that are associated with any transmission line. It is necessary to take into consideration the need for access roads for construction and maintenance activities. If a transmission line is remote from existing settlements, it is also likely to be far removed from existing infrastructure. The advantages described above may be neutralised by the need to construct longer access routes. For instance, longer access roads could increase the probability that:
    - The construction of these roads might necessitate the relocation of populations;
    - Access roads might interfere with people's daily movement patterns and impact on their safety;
    - Access roads might cut across private property, thereby increasing the number of landowners to be affected by construction and maintenance activities; and

    - Access roads could interfere with tourism and recreational activities.
- The disadvantages of locating the transmission line far from existing settlements would appear to be the fact that:
    - It would reduce the probability that construction workers would provide a boost to the informal sector; and
    - It would increase the distance that would have to be traversed by services infrastructure for construction camps. Hence, it would increase the burden on local authorities that are required to provide that infrastructure.

In light of the information in this report, the nominated preferred site for the substation site is site 4, followed by site 3. No fatal flaws were identified with any of the sites from a socio-economic perspective.

In nominating a preferred site the following principles applied:

- The avoidance of potential long-term negative impacts should be given preference over short-term positive impacts.
- Avoid, where possible, areas where there is no infrastructure (bushveld), to keep the sense of place intact.
- Between grazing land for cattle and cultivated land, rather affect grazing land.
- Substation sites that allow for power lines to follow existing infrastructure, such as roads and power lines, should be given preference as the impacts on agricultural activities will be localised in one corridor - provided the cumulative visual impact will not result in negative economic impacts.
- The input from the visual specialist is crucial to ensure that a corridor with the least significant visual impacts is selected.
- It seems preferable to locate the site away from any towns or villages, as this could reduce the probability that the project would interfere with people's daily movement patterns or impact on their health and safety (more so during construction).
- The use of existing access roads mitigate should be given preference. The construction of new roads might
    - necessitate the relocation of populations;
    - interfere with people's daily movement patterns and impact on their safety;
    - cut across private property, thereby increasing the number of landowners to be affected by construction and maintenance activities; and
    - interfere with tourism and recreational activities.
- The disadvantages of locating the site far from existing settlements would appear to be the fact that:
    - It would reduce the probability that construction workers would provide a boost to the informal sector; and

- It would increase the distance that would have to be traversed by services infrastructure. Hence, it would increase the burden on local authorities that are required to provide that infrastructure.

6. RECOMMENDATIONS

The proposed terms of reference for the detailed SIA are as per the subsections below.

6.1.1 Geographical Change Processes

To fully assess the potential impacts as a result of geographical change processes, more information is needed on the following aspects:

- The size and number of expected construction and operational vehicles and machinery as well as route(s) that will be used to gain access to the various sites and the construction activities on site need to be determined. The routes of the proposed Dinaledi-Marang transmission power lines and the location of the proposed Delta substation and its related power lines should be determined. Information should be requested from the project proponent, and from the relevant specialist conducting the traffic impact assessment, if any;
- Planned developments for the area in terms of tourism, mining and agriculture need to be determined. A desktop study of the IDP and SDF of the affected district and local municipalities in terms of future developments and tourism should be continued. If additional information is required other than that contained in the IDP/SDF, conduct interview(s) with relevant town planners and tourism bodies as well as other relevant reports.
- The location of landing strips, centre pivots and dwellings need to be confirmed, as well as the land use of affected farm portions. Participant Rural Appraisal should be executed, including one on one interviews and/or focus group discussions with affected landowners (black and white).

6.1.2 Demographic Change Processes

To fully assess the potential impacts as a result of demographic change processes, more information is needed on the following aspects:

In order to address these information gaps, the following studies are recommended for the Impact Assessment Phase:

- Conduct a comparative desktop study between Census 2001 and Community Survey 2007 data to determine significant socio-demographic trends. Through

interviews/focus group discussions during Participant Rural Appraisal determine the profile of the potentially affected parties, including those of the workers;

- Request construction and maintenance information from the project proponent – work force size, skills level, origin, timeframes, activities and number of local job opportunities;
- Interview the public participation consultants on the local residents' viewpoints and expectations in terms of the proposed project within the social realm, and study the Issues and Responses Document to determine the potential risk for conflict and other forms of active and passive social mobilisation;
- Interview the project proponent, other companies and the municipality about current and planned projects in the area, their timeframes and work force size as well as location of construction camps to determine potential cumulative impacts;
- Access crime statistics and interview members of the SAPS if necessary to determine the current crime rate and nature of crimes committed in the area;

6.1.3 Economic Change Processes

To fully assess the potential impacts as a result of economic change processes, more information is needed on the following aspects:

- Request the necessary information from the project proponent and interview them if necessary
    - The local employment opportunities that will be created, both directly and indirectly;
    - Number of jobs available and skills levels of these;
    - If available, the average period of employment and an outline of a typical salary package for skilled and unskilled labour;
    - The input cost of the project;
- Access Quantec data to determine the study area's contribution to the GDP;
- Use an input-output model to quantify economic impacts to address employment loss and gain, income loss and gain and regional loss and gain;
- Execute an economic dependency model;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and vulnerable people in the study area (poor, low skilled, poorly educated people, access to services below RDP standard) to determine the size of farms, the economic activities on land, to obtain information about the tourism industry, and the attitudes towards the housing of construction workers in the community;
- Interview estate agents in the area to assess the potential drop property values in as a result of the presence of power lines.

6.1.4 Institutional, Empowerment and Legal Change Processes

To fully assess the potential impacts as a result of institutional and empowerment change processes, more information is needed on the following aspects:

- Obtain the issues register or issues report from the public participation consultants to determine the recurrent issues raised from the public's side and how these issues were addressed throughout the process. An analysis of these issues would indicate the risk for social mobilisation;
- Obtain information from the local municipality on the existing capacity to deliver municipal services and to determine the capacity for an additional demand on municipal services;
- Discuss issues and concerns regarding the negotiation process and how these issues should be addressed with the project proponent; and
- Obtain and analyse information on any existing disaster management plans at similar installations. Also obtain information from the local municipality on any existing emergency and health care services (both governmental as well as private) and determine their capacity to handle potential disasters.

6.1.5 Socio-cultural Change Processes

To fully assess the potential impacts as a result of socio-cultural change processes, more information is needed on the following aspects:

- Request information form the project proponent on the construction process and the likely profile of a typical construction worker;
- Assess the visual assessment report;
- Participant Rural Appraisal including interviews and/or focus group discussions with landowners and communities in the study area to gain an understanding of the cultural landscape;
- Conduct a desk top study to determine the health profile of the area, including typical indicators such as HIV prevalence, etc.; and
- Interviews with municipal officials and other authority figures (such as the South African Police Service) to determine the current extent of social problems in the area and initiatives to combat them.

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