

**PROPOSED 1x400kV MEDUPI-MARANG and  
2X400kV MEDUPI-DINALEDI TRANSMISSION POWER LINES**

**SUPPLEMENTARY REPORT**

as part of the

**ENVIRONMENTAL IMPACT ASSESMENT**

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## SUMMARY

This report serves to supplement the Social Impact Assessment Reports which were submitted as part of the Environmental Impact Assessments for the Medupi-Marang and Medupi-Dinaledi proposed 400kV Transmission power lines. Additional assessment of the area just north of Spitskop substation was necessary to identify a final route corridor for the three proposed Transmission power lines through this area. Specialist input was required as follows:

- Assess the study area in question;
- Propose a route corridor which will have the least significant impact on the affected communities, without traversing mining areas, the identified wetland and the proposed Heritage Park development.

The Pilanesberg-Madikwe Corridor of the proposed Heritage Park is to the west of the study area and had to be avoided. For this section of the Heritage Park a community owned Big 5 reserve with accommodation, the Lebatlane Game Reserve of about 31 000 hectares, is planned. The Tshweneng Hills Heritage Site falls in this section of the Heritage Park. A development is planned on the south eastern side of the ridge which runs from north to south parallel to the Heritage Park boundary, along Kraalhoek and Mmopyane. Mining activities occur in the eastern section of the study area, and a wetland was identified in the Nooitgedacht area. These areas should be avoided.

To fulfil the objectives of this report meetings were attended, a field visit was conducted, and maps and satellite images were studied.

The information gathered indicated that the main differentiators in choosing a final route corridor would be in changes to demographic, land use, socio-cultural and economic processes during the operation of the 3x400kV Transmission power lines. It was recommended that the final route corridor should result in the displacement of a minimum number of people, and should have the least potentially significant negative impact on the health and safety of people. A route corridor skirting the eastern side of Mantserre was therefore recommended. However, where the study corridor meets up with the existing power lines in the south, care should be taken to avoid the mining infrastructure to the south as depicted by satellite imagery. A final line was plotted based on these recommendations.

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## **1. BACKGROUND AND INTRODUCTION**

This report serves to supplement the Social Impact Assessment Reports which were submitted as part of the Environmental Impact Assessments for the Medupi-Marang and Medupi-Dinaledi proposed 400kV Transmission power lines. Additional assessment of the area just north of Spitskop substation was necessary to identify a final route corridor for the three proposed Transmission power lines through this area.

The first sub section below gives a description of the scope of work, followed by a section on the methodologies that were used to collect information, the limitations of the study, and finally a description of the study area is given.

### **1.1. SCOPE OF WORK**

Specialist input was required as follows:

- Assess the study area in question;
- Propose a route corridor which will have the least significant impact on the affected communities, without traversing mining areas, the identified wetland and the proposed Heritage Park development.

### **1.2. APPROACH AND METHODOLOGY**

This section focuses on the approach and methodologies that were applied to fulfil the objectives of this report. Meetings were attended, a field visit was conducted, and maps and satellite images were studied.

#### **Meetings**

On the 22<sup>nd</sup> of August 2007, meetings with the Traditional Authorities, the Bakgatla BaPhelane and Bakgatla ba ga Kgafela, were attended. The purpose of the meetings was to introduce the final proposed route corridors, to share the problems identified in the area that is evaluated in this report, and to take cognisance of any issues, concerns and recommendations in this regard.

#### **Site visit**

The site visit was conducted on the 24<sup>th</sup> of August 2007. The study area was observed, and areas of importance were marked by using the GPS (Global Positioning System). A member of the local community accompanied and assisted the team.

#### **Map and satellite images**

A 1:50 000 map of the area was studied in detail and used during the field trip.

Google Earth was used to cross validate the information on the map and the observations made during the field visit.

#### **Desktop study**

Census data was accessed as well as a discussion document by Professor Rika Snyman on oil pipeline security (2007) and the Moses Kotane Local Municipality Integrated Development Plan (IDP).

### **1.3. LIMITATIONS AND ASSUMPTIONS**

- Unless otherwise stated, the demographic statistics reflected in this document are based on census 2001 data obtained from the Municipal Demarcation Board. Note that this data should only be viewed as indicative of the broad trends within the area and not as a rigid representation of the area.
- The study 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. However, the specialist did endeavour to take an evidence-based approach in the compilation of this report and did not intentionally exclude scientific information relevant to her assessment.
- People's actions can never be predicted with 100% accuracy, even when circumstances are similar and predictions are based rigorous research results.
- The mining company was not consulted to verify that their activities will be able to accommodate the final proposed route corridor.

### **1.4. STUDY AREA**

The study area is depicted in Map 1 (page 7). Although proposed route corridors are indicated on the map, the whole area was assessed to identify a preferred route corridor. The route corridors indicated on the map were used as a point of departure to assess the whole study area. The Pilanesberg-Madikwe Corridor of the proposed Heritage Park is to the west of the study area and has to be avoided. For this section of the Heritage Park a community owned Big 5 reserve with accommodation, the Lebathlane Game Reserve of about 31 000 hectares, is planned. The Tshweneng Hills Heritage Site falls in this section of the Heritage Park. A development is planned on the south eastern side of the ridge which runs from north to south parallel to the Heritage Park boundary, along Kraalhoek and Mmopyane. Mining activities occur in the eastern section of the study area, and a wetland was identified in the Nooitgedacht area. . These areas should be avoided.

The study area falls in Moses Kotane local Municipality, which is part of the Bojanala District Municipality in the North West Province. Wards 5 and 7 in Moses Kotane LM are the directly affected areas in the study area. The villages in these wards are Kraalhoek, Mmopyane and Mmantserre villages. Kraalhoek and Mmopyane fall under ward 5 and Mmantserre falls under ward 7. The potentially affected Traditional Authorities are the Bakgatla ba ga Kgafela, and Bakgatla BaPhelane.

Map 1: The Study Area



## **2. ASSESSMENT OF THE STUDY AREA**

The information gathered indicated that the main differentiators in choosing a final route corridor would be in changes to demographic, land use, socio-cultural and economic processes during the operation of the 3x400kV Transmission power lines. These change processes are defined as follows:

- demographic change processes are the changes in the number and composition of people;
- land use change processes are changes in land use patterns;
- socio-cultural change processes are the changes in the way in which humans behave, interact and relate to each other and their environment and the belief and value systems which guide these interactions;
- economic processes relate to the way in which people make a living and the economic activities in society.

Potential impacts as a result of institutional and legal processes (changes in the role, efficiency and operation of governments and other organizations) together with empowerment processes (changes in the ability of people to get involved in and can influence decision making processes) will be similar across the study area.

The sub sections that follow discuss how the placement of the lines might impact on demographic, land use, socio-cultural and economic changes.

### **2.1. DEMOGRAPHIC CHANGE PROCESSES**

Ward 5 (Kraalhoek, Mmopyane) covers an area of approximately 387 191 km and has a total population of approximately 9 041. Ward 5 is one of the 10 fastest growing wards in the province. Mmopyane had a total population of 1 601 people in 2001 and is expected to have grown to 2 140 people by 2011. Kraalhoek registered a total population of 3 320 people in 2001 and the number is expected to be 4439 by 2011, which is an average of 100 people per year (Moses Kotane IDP).

In comparison, Ward 7 (Mantserre) covers an area of 135 196 km and has an estimated total population of 8 443 people. The projected population growth for this ward is not known, but because it is in close proximity to ward 5 and the Swartklip mine, the conclusion is that the population growth will be similar to that of Mmopyane.

It is not expected that the lines will affect the population growth. Although the lines will take up a servitude of 165 meters, and people will not be allowed to settle in the 165 meter servitude, it is expected that there will be enough space for people to settle elsewhere in the area. Of concern is the fact that people might settle in the servitude, which will put their health and safety at risk. This is especially true for areas where informal settlement occurs, as newcomers will tend to settle in areas where informal settlement has already taken place. Already the open space between Mantserre and Mmopyane are taken up by informal houses, as well as open areas alongside the Kraalhoek-Mmopyane ridge.

Many people will have to be relocated should a route corridor be chosen which crosses the ridge. However, these people can be resettled in open areas in the village as there seem to be enough space. Although their relocation will not change the population profile significantly, the number of people to be relocated will be significant. For example, for the route corridor crossing the ridge as depicted on the map, an estimate of 30 and more households will have to be relocated. At an estimate of five people per household the total number of people who will have to be displaced



start from minimum 350 people. Should a route corridor be implemented which avoid the ridge by going north of the ridge, only a few people might have to be displaced and resettled. At an estimate of five people per household, it estimated that five informal houses might have to be demolished, bringing the estimated number of people that might have to be displaced to 25 people.

## **2.2. LAND USE CHANGE PROCESSES**

The study area is predominately rural. Housing structures are both of informal and formal. Inhabitants built their houses themselves and the yards equal up to approximately 10x10 meters. Concerning the tenure, at least 78.0% of the approximately 2 300 dwellings in Ward 5 (Kraalhoek, Mmopyane) are owned and fully paid followed by 10.8% which is occupied rent free. In ward 7 (Mantserre) only 55.5% of the approximately 2 000 dwellings are owned and fully paid, and 29.0% of the dwellings are rented. This gives an indication of the permanency of occupation - Kraalhoek and Mmopyane inhabitants have a longer history with the area and therefore are also more likely have a stronger attachment to the area.

Most community members farm in their own yards for non-commercial purposes and have their livestock either in or close to their yards, and that the observation was more recurrent in the Kraalhoek area. Land that is not occupied is mostly used for grazing, which can carry on in the servitude.

Land use change processes will be more intense should a route corridor over the Kraalhoek-Mmopyane ridge be proposed. The most significant impact of land use change will be the displacement of people, which will have an impact on relationships as well as psychological and community well-being.

The effect of the cement factory on the lines might be of concern and will have to be assessed by the technical team. This factory is to the north of Kraalhoek. The area is very dusty because of the activities, and the effect of the dust on the lines will have to be mitigated. It might be that more regular maintenance activities will be necessary.

## **2.3. SOCIO-CULTURAL CHANGE PROCESSES**

A strong sense of place and culture seem to be present in the Kraalhoek and Mmopyane villages: many houses seem to have been built by families over a period of years; structures have been built in addition to the main house to accommodate growing families or those coming home over weekends; subsistence farming is practiced; members of families and the community sit together, chatting and laughing; and graveyards are well maintained. A proposed route corridor through these communities will have a more significant impact on movement patterns and therefore relationships between people because of the number of people who will have to be displaced and resettled.

It is preferred that a route corridor skirts settlements in the area, so as not to significantly impact on the socio-cultural landscape and also to mitigate potential safety and health impacts. Safety issues and potential impacts are discussed in detail in the main report.

In terms of potential sabotage of the Transmission power lines, the level of visibility and accessibility of the lines ensure that a larger pool of potential offenders come into contact with the lines, increasing the risk of vandalising and sabotage, putting the safety of the community members at risk and potentially impacting on those who benefit from the line (Professor Rika Snyman, July 2007). It is therefore preferable that the lines do not go through settlements and growth areas.

## **2.4. ECONOMIC CHANGE PROCESSES**

The most significant economic change will be experienced as a result of relocation. The negotiation and compensation process is discussed in detail in the main Social Impact Assessment reports. Many people living in informal houses and renting houses might experience the relocation process as positive because of the positive impact on their quality of life. The area that they will be relocated to will be guided by input from the Traditional Authorities. The positive economic impact might be accompanied with negative impacts such as a loss of sense of place. The process of moving, re-establishing a garden, kraal and vegetable patch will have negative impacts. It is preferred that a route corridor skirt settlements.

## **3. CONCLUSIONS**

The study area was assessed considering demographic, land use, socio-cultural and economic changes as a result of a proposed corridor. The changes and potential impacts were considered for the operational phase of the project. It is not expected that changes during construction will be significantly different for different route corridors. The same number of construction workers will be used for construction, the communities have similar profiles, and therefore the changes and impacts as a result of their presence will be very similar.

Table 1 compares the difference in change processes and impacts between a route corridor that goes through settlements and one that skirts settlements. In light of the summary in Table 1, a route corridor which skirts settlements is preferred. To ensure that the potential impacts are kept to a minimum, additional Environmental Management Plan (EMP) input is listed in Section 5, page 12.

## **4. RECOMMENDATIONS**

The final route corridor should result in the displacement of a minimum number of people, and should have the least potentially significant negative impact on the health and safety of people. A route corridor skirting the eastern side of Mantserre will therefore be the best. However, where the study corridor meets up with the existing power lines in the south, care should be taken to avoid the mining infrastructure to the south as depicted by satellite imagery. The potential impact of mining activities on the power lines, and people as a result, are discussed in detail in the main Social Impact Assessments reports. The route corridor should therefore preferably run along the pink and purple corridor depicted on Map 1. These lines will have to cross the existing lines in the south, and maintenance programmes will have to take cognisance of the importance of maintaining these lines in order to decrease economic, health and safety risks. The second preferred option is a route corridor running north of Kraalhoek and then south between Mantserre and Mmopyane.

**Table 1: Selection of a route corridor**

Change process	Potential impacts (negative)	Going through settlements	Skirting settlements
Demographic	Displacement Interaction patterns Movement patterns Quality of Life	A high number of people will have to be displaced and relocated.	Significantly less people will have to be displaced and relocated.
Land use	Safety and health Psycho-social Community cohesion	People might move into the servitude, more so in the Kraalhoek area.	People might move into the servitude, especially between Mantserre and Mmopyane.
Socio-cultural	Sense of place A main concern is the proximity of the line to communities, which could potentially impact on health and safety	Displacement of people will be necessary and the lines will affect the cultural landscape, activities and relationships between people. A line closer to the proposed development on the eastern side of the ridge (as well as people who currently live there) will impact negatively on the sense of place.	A route going through an empty space between Mantserre and Mmopyane is cause for concern because of potential health and safety concerns. However, less people will have to be displaced, and activities will not be disrupted. It is highly likely that future developments will be in the form of informal settlements as a result of migratory workers.  A corridor between Mantserre and the mining area is preferred. The cultural landscape in this area is not as significantly present in this area.
Economic		A high number of people will have to be displaced and relocated. Impacts might be positive and negative.	Significantly less people will have to be displaced and relocated and less people will be impacted on.

## **5. EMP INPUT**

### **5.1. HEALTH AND SAFETY**

- Educate communities surrounding the high voltage Transmission power line on the legislation regarding their conduct around the power line. Also explain the presence of Electric and Magnetic fields and mitigation of potential health impacts as a result of the power line.
- Such an awareness campaign should be based on and addressed Frequently Asked Questions (FAQs) regarding a Transmission power line, e.g. is it safe to walk underneath a Transmission power line if the surrounding area is wet or it is raining?
- The awareness campaign should also focus on standard operating procedures when there is a breakdown in the line, e.g. people should steer clear of the area, who to contact, etc.
- Educate surrounding communities about the dangers of living in the servitude.
- Provide a safe passage way for community members to minimise the impact on movement patterns.
- A form of signage on the pylons should also indicate that it is dangerous.
- In some way a barrier (psychological and/or physical) should indicate that no structures should be built in the servitude.

### **5.2. SAFETY AND SECURITY**

- Timeous prevention of informal settlements in the vicinity of the power line.
- The local community should play an active participatory role in crime prevention. This could be achieved by means of establishing a community forum that meet quarterly or once a month to discuss issues and progress surrounding the project. Locals should act as informants and social protectors of the power lines. Handsome rewards could be offered for localised protection through information sharing (Professor Rika Snyman).
- Intrusion detection systems and dedicated communication systems should be implemented to ensure proactive identification of suspicious activities around the power line (Professor Rika Snyman).
- Eskom should become involved in communities to ensure good relationships - this should include provision of power to rural communities. Eskom should be accessible to report unethical behaviour of maintenance workers and suspicious behaviour. A toll free number could be of help, but other means of communication should also be considered.
- Patrols of the line should be done on a more regular basis.
- Public education and information campaigns should be launched.
- Those who sabotage a power line should be punished.
- The physical visibility and accessibility of the line should be limited. This can also be done by ensuring that specialised skills and tools are necessary to sabotage a line (Professor Rika Snyman).
- The quality and visibility of guardianship can significantly lower the victimisation risk (Professor Rika Snyman).
- Maintenance workers should be clearly identifiable, either by wearing overalls and/or identification cards.

- Consult with Traditional Authorities prior to maintenance work taking place on the Transmission power line, to inform them of when the maintenance team will be on site, for how long, and approximately how many persons the team will consist of.