



# Margen

INDUSTRIAL SERVICES



## MATIMBA B (MEDUPI) TRANSMISSION INTEGRATION

MATIMBA B (MEDUPI)-MARANG  
400KV TRANSMISSION LINE  
CONSTRUCTION AND MARANG  
SUBSTATION UPGRADE

ENVIRONMENTAL IMPACT  
ASSESSMENT

## ENVIRONMENTAL IMPACT REPORT

VOLUME I – MAIN REPORT  
(FINAL REPORT TO AUTHORITIES)

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## EXECUTIVE SUMMARY

### INTRODUCTION

Eskom is planning to construct a new power station near the existing Matimba power station at Lephalale in the Limpopo Province. A separate environmental impact assessment (EIA) has been conducted for the proposed power station site; previously named Matimba B for the purposes of this EIA, and a Record of Decision (RoD) has already been issued. The new name for the power station is Medupi. Medupi power station will need to be connected to the transmission network. Studies by Eskom's Transmission System Planning considering the need to evacuate from the power station, network capacity, and stability, as well as centres of growth in electricity demand, have identified the minimum infrastructure required to integrate Matimba B (Medupi) with the rest of the network.

In particular, the following projects would help alleviate stresses on the total transmission network system and more so in the Brits/GaRankuwa and the Rustenburg/Thabane areas which includes more specifically the following:

- an additional 400kV transmission power line to the Marang substation located near Rustenburg from Matimba B (Medupi);
- an additional two 400kV transmission power lines to Dinaledi substation located near Brits also from Matimba looped into the Spitskop substation;
- expansion of the existing substations of Marang, Spitskop and Dinaledi to accommodate the new 400kV transmission power lines.

Together, these projects are combined to form the Matimba B Transmission Integration Project. However, for the purposes of the environmental process, they are separated into two EIAs (and therefore separate applications) as follows:

- the Matimba-Dinaledi power lines (and associated expansions at Spitskop and Dinaledi substations), and
- the Matimba-Marang power line (and associated expansion at Marang substation)

This EIR deals with the second of the two projects.

Margen Industrial Services (Margen) has been appointed by Eskom Transmission to undertake the required environmental authorisation work. Margen appointed PBA International (SA) (PBAI) to assist with this process. The project is being run in parallel with the Matimba B (Medupi)-Dinaledi EIA and makes use of a single Public Participation Process.

**Note:** All comments received on the EIR for Public Review have been incorporated into this final version of the EIR that is submitted to the authorities for consideration and approval. This final version of the EIR is also made available to the public for viewing.

## APPROACH

A full EIA process is run for the project. This includes:

- The Scoping Phase – approved by the authorities by late March 2007, and
- the EIA Technical Assessment Phase – now targeted for approval by the authorities by the end of November 2007.

Both phases include extensive public consultation. The full EIA process is being carried out in accordance with Regulations 1182 and 1183 (1997) of the Environment Conservation Act No. 73 of 1989, and within the principles of the National Environmental Management Act No. 107 of 1998. From the onset of the EIA-project, the consultant has been intent on undertaking an integrated EIA (including the Scoping) process for the Matimba B Transmission Integration Project (1 X 400kV Matimba B (Medupi)-Marang power line and 2 X 400kV Matimba B (Medupi)-Dinaledi power lines) whereby two separate applications were launched for each of the transmission links. This also meant that two separate plans of study for scoping (PoSS), Scoping Reports (SRs) and Plans of Study for EIA (PoS-EIA) were submitted, one for each of these links.

The public participation process (PPP) has, as indicated in the PoS-EIA, to date been conducted as a single process whereby all identified interested and affected parties were consulted with simultaneously. It is still planned that the lead authority will issue two separate RoDs for the two EIAs based on the two separate EIRs that will be submitted.

The scoping phase was used to research the study area and identify those issues relevant to the study. The SR was intended to set out the issues identified and how these would be taken forward into the EIA phase. In essence the scoping phase was used to attempt a 'scoping out' of the initially proposed corridors for the power lines and areas within the study area that would not be environmentally suited for placing the transmission power lines. The EIA phase investigated key issues in more detail, with specialist studies undertaken as identified in the scoping phase and indicated in the PoS-EIA. The PoS-EIA also set out the intended approach to the EIA phase and was submitted to the authorities after completion of the scoping phase.

The project lies within two provinces; Limpopo and North West. The national Department of Environment and Tourism (DEAT) is understood to be the decision-making authority on all transmission projects above 132kV in size. However, the Environmental Assessment Practitioner (EAP) undertakes to copy all correspondence to the offices of the provincial authorities and will invite the case officers to all meetings, site visits, etc. that involve authority participation. The timelines and deliverables on this project are critical to the overall project timelines. The achievement of these deadlines will require that the EAP adheres to deadlines, and also that the authorities assist in minimising document review timeframes. To date several delays have caused an overall delay of approximately eleven (11) months for this project.

Initially the consultant determined a study area for the purposes of the scoping phase of which the boundary was determined based on the most extreme boundary area within which the power line routes as proposed by Eskom Transmission could cost-effectively and within reasonable technical ability, be placed. The consultant further appointed a number of specialists to conduct studies mainly focussed on rating the potential routes as indicated by Eskom in order of preference and based on the specific findings of each individual specialist study. This information was used mainly as a guidance to focus efforts towards a final route option with at the most, one or two alternatives, thus resulting in one, two or three most preferred routes for each power line.

For the purposes of presenting the study area and possible corridors to the public, each of the route options were indicated on a map as 5km wide route corridor options. Various maps were viewed by the public but the intention was always that there should be an understanding that the routes could in theory be placed anywhere within the study area.

At the end of the scoping phase a most preferred route option was determined for most of the distance between the proposed Matimba B (Medupi) Power Station and the applicable substations, splitting into as much as three route options closer to the Spitskop Substation area.

During the technical EIA phase these route options were carefully considered by the EIA team to further determine their preferences in relation to each other, thus establishing a single route corridor along the entire distance between the required connection points that was further considered by the relevant interested and affected parties during this phase.

Further studies were also conducted to determine what the applicable separation distances between existing power lines and the newly proposed lines should be and where the best location for the actual placing of the lines would be. This final design is proposed as the transmission power line placement that Eskom Transmission will follow. Note however that it is proposed that will further be walked by the relevant specialists to finally indicate the most preferred exact placing of the power line pylons based on these on-site specialist findings.

For this reason the EIR indicates a 55m wide servitude zone on the map as well as an additional 500m wide movement zone on either side of the outer boundaries of the servitude zone to allow for any slight movements in the proposed servitudes after the RoD had been issued, should specialists find any on-site problems that would require any pylon re-placing or should the negotiator become aware of or negotiate any such a power line re-placing.

Servitude negotiations need to be considered and it is possible that individual landowners will have requirements or preferences for exact line placements on their land which will be negotiated with the Eskom negotiator after issuing of the RoD. This means that some leeway is required as to the final commitment of a servitude route and therefore a further requirement to have the 500m movement zone on either side of the proposed transmission power line servitude.

#### **DEVELOPMENT PROPOSAL**

The tower design will be the already used standard cross-rope suspension tower for power lines over normal terrain and for sufficiently straight and level alignments. Currently this option is both the most cost effective and environmentally suitable option. Strain towers will be utilised where difficult terrain is encountered or line deviations of more than 3° is unavoidable.

The proposed 400kV cross-rope pylons will normally be in the order of 38m in height with a minimum conductor clearance of 8.1m. The conductor height is specifically aimed at ensuring that the potential of being affected by human activities or even natural occurrences would be safely minimised and additionally that electromagnetic fields are kept as far away from potentially affected people, animals and vegetation as reasonably possible, based on current knowledge of the effect that these conductors could have.

The standard servitude size for 400kV transmission power lines is 55m and pylons are placed between 350m and 500m apart over the power line length depending on terrain and route angles. Note however that where self-supporting strain towers are used, the distance between such towers could be as little as 150m. Eskom obtains a right of way over the servitude area that allows the company to utilise the servitude land for purposes of electricity transmission to the approved design and technical constraints as approved by the relevant authority in terms of a RoD to be issued in terms of the relevant legislation and pertaining to the environmental impact report (EIR).

The right obtained by Eskom also entails certain restrictions on land owners over whose land the servitude is secured as well as allowances. These would include restrictions on and/or allowance of certain activities within the servitude area in terms of a contract reached between the applicable landowner and Eskom Transmission.

The Marang substation will have to be upgraded to receive the additional 400kV transmission power line from Matimba B (Medupi). The existing 400kV yard terrace is to be extended slightly. The area of expansion is however flat and without any identifiable sensitive environmental features.

It would suffice to indicate that different links between Matimba B (Medupi) and the various substations located towards the south and especially south-east sections of the study area had been considered, also taking into consideration the planned possible transmission links that would be necessary between Botswana, Matimba and the main grid areas.

The study area in itself presents a number of restricting features such as topography, tourism and socio-economic activity zones and settlement zones. All indications are that alternatives that would involve the placement of transmission power lines outside the study area will entail significant additional costs as well as an excessive increase in physical land surface disturbance and potentially an excessive increase in cumulative environmental impacts. Alternatives that would entail placing the power lines outside of the study area are therefore considered to be neither viable nor environmentally acceptable in general.

In addition to the above the majority of the area to the east of the study area hosts the Waterberg Biosphere which is an internationally recognised biosphere. This would render the placing of the lines through this zone more damaging to the environment from a cumulative point of view in addition to the already increased overall environmental impacts caused by the increase in power line distance alone.

It is necessary for Eskom Transmission to establish the necessary transmission links by the time the new power station is operational and this is planned to occur by 2010. The EIA process is envisaged to produce a result no later than late 2007 and this would mean that servitude negotiations will have to be finalised towards the end of 2008. The construction of the power line will take approximately two years so that it is completed towards the end of 2010.

The project is of significant strategic importance to the country and therefore any delays in the project programme is expected to have potential negative consequences from an electricity supply point of view in various areas of the national grid. Various grid connection alternatives have been considered, both by Eskom Transmission and the appointed environmental consultant. Based on the best technical option for linking the entire grid to the Matimba complex, connection points were determined. These were determined to be the Marang substation by means of a single 400kV transmission power line and the Spitskop and Dinaledi substations by means of two 400kV transmission power lines connected to each substation.

After having considered the transmission network planners' connection options, Eskom Transmission's Land and Rights department determined the technically most-suited routes, from an Eskom point of view, for the required 400kV transmission lines to be able to link up with the various substations as indicated by the planners. The consultant has further considered these initially proposed routes as well as the economic and physical constraints for making the project viable in determining a study area and utilising the proposed routes as initial indicator corridors during the scoping phase.

During the public participation process for the scoping phase, the consultant already indicated possible alternatives for the corridors which were also proposed to the public on various maps and which generated significant feedback from the PPP participants. The normal consideration of route alternatives is applicable and has been implemented as part of this study. The consultant has refined this approach by establishing a spatial assessment system whereby various environmental impact factors are mapped to act as an additional indicator of potentially most-suited route options. This was already conducted during the scoping phase for the entire study area and produced successful results that could be used as a power line placement guide early on.

The no-go option for this project is not considered to be applicable in terms of total project go-ahead. In the specialists' assessments for scoping it has been determined that the social and economic benefits that the project would have, are of greater significance than any of the negative environmental impacts and even if a combination of or cumulative impacts exist that would outweigh this total benefit, such impacts would only occur within their applicable smaller spatial zones or areas in the study area and it would be possible to place the lines away from such areas or at least to apply sufficient mitigating measures to ensure this.

Where a project is of the level of strategic importance such as which is applicable to this project, where in fact the electricity supply and therefore the economy of the entire country is affected, it is held that none of the known negative impacts would be a sufficient argument for a total “no-go” scenario. It is however acknowledged that areas of “no-go” for the placing of the applicable electricity transmission infrastructure could and most likely would exist.

During the scoping phase a complete assessment of the potential impacts from the proposed activity on the environment was conducted for the power lines.

### **PUBLIC CONSULTATION**

Margen Industrial Services conducted the Public Participation Process (PPP) for the Scoping Phase of the EIA for Matimba B Transmission Integration Project, involving as many potential interested and affected parties (I&APs) as possible. The comments received and issues raised during the process were collated into the Scoping Report and were used to assist the environmental consultant to determine possible impacts and mitigation measures for the project. Some of the issues raised were further investigated in detail during the EIA Phase and indicated in this EIR. Please see **ANNEXURE III-1** for the complete list of comments and responses on this project.

During the period after submission and awaiting approval of the PoS-EIA and the SR, public consultation continued by further informing I&APs of the outcomes of the SR and inviting all parties to continue to be informed of the project and to submit further comments and concerns. Additional I&APs were also identified during this period and an effort was made to continue with the identification of and further consultation with especially landowners but also other stakeholders that were not found and contacted during the PPP during the scoping phase. This process was continued until the deadline for comments on the draft EIR document was reached. Please see **ANNEXURE IV-5** for the map showing the landowners’ contact status. The further methodology, approach and findings of the PPP after completion of the scoping phase is described and explained in **Section 5** of the EIR.

Any further feedback and/or comments received from the public on the EIR is indicated and addressed in this EIA report which is submitted to the relevant authorities for consideration and approval. The EIR was made available to the public as a draft document for consideration and review. Feedback received on the initial draft document was incorporated into this final EIR submitted to the DEAT and also made available to the public for viewing.

### **RECOMMENDATIONS, CONCLUDING REMARKS & WAY FORWARD**

In **ANNEXURE IV-4** the proposed transmission line placement with buffer zone for the Matimba B (Medupi) to Marang line is indicated on a map.

Further studies along the proposed corridor during the technical EIA phase included the following:

- Land use identification and accessibility options;
- ecological assessment for fauna and flora and identification of sensitive areas;
- identification of significant archaeological and heritage sites;
- identification of socially sensitive zones; and
- identification of visually sensitive and challenging areas.

In addition to the above, it was necessary to address those issues contained in the Comment & Response Sections of the PPP Report for the SR and the EIR. The identified relevant issues that can be addressed in terms of technical EIA assessment are also listed in this document and addressed accordingly.

Finally it was also necessary to address specific issues raised by the DEAT in this document. These issues are also listed in the document and addressed accordingly.



# **MATIMBA B (MEDUPI)-MARANG 400KV TRANSMISSION LINE AND MARANG SUBSTATION UPGRADE**

## **ENVIRONMENTAL IMPACT ASSESSMENT**

## **ENVIRONMENTAL IMPACT REPORT**

### **1. INTRODUCTION**

Eskom is planning to construct a new power station near the existing Matimba power station at Lephalale in the Limpopo Province. A separate environmental impact assessment (EIA) has been conducted for the proposed power station site; previously named Matimba B for the purposes of this EIA, and a Record of Decision (RoD) has already been issued. The new name for the power station is Medupi. Medupi power station will need to be connected to the transmission network. Studies by Eskom's Transmission System Planning considering the need to evacuate from the power station, network capacity, and stability, as well as centres of growth in electricity demand, have identified the minimum infrastructure required to integrate Matimba B (Medupi) with the rest of the network.

In particular, the following projects would help alleviate stresses on the total transmission network system and more so in the Brits/GaRankuwa and the Rustenburg/Tlhabane areas which includes more specifically the following:

- an additional 400kV transmission power line to the Marang substation located near Rustenburg from Matimba B (Medupi);
- an additional two 400kV transmission power lines to Dinaledi substation located near Brits also from Matimba looped into the Spitskop substation;
- expansion of the existing substations of Marang, Spitskop and Dinaledi to accommodate the new 400kV transmission power lines.

Together, these projects are combined to form the Matimba B Transmission Integration Project. However, for the purposes of the environmental process, they are separated into two EIAs (and therefore separate applications) as follows:

- the Matimba-Dinaledi power lines (and associated expansions at Spitskop and Dinaledi substations), and
- the Matimba-Marang power line (and associated expansion at Marang substation).

This EIR deals with the second of the two projects.

The construction of the power line and associated substations is a scheduled activity in terms of Schedule 1 of Regulation 1182 (1997) of the Environmental Conservation Act No. 73 of 1989 accordingly and as such requires environmental authorisation:

- ⇒ *Construction, erection of facilities for commercial electricity generation with an output of at least 10 megawatts and infrastructure for bulk supply;*
- ⇒ *Change of land use from agricultural or zoned undetermined use or an equivalent zoning to any other land use.*

• The integration of the Matimba B (Medupi) power station also involves transmission links with newly planned substations and 765kV power lines as part of what was previously known as the Mmamabula-Matimba Transmission Integration Project. That project has been further divided into a number of smaller projects. In this report the concept planning for these other projects is indicated as background information. Maps and figures indicating any aspects of these other projects are in no way binding to Eskom or the environmental consultants and should be considered as speculative at this point in time and is merely aimed at indicating to potentially interested and/or affected parties the existence or planning for these other projects.

Margen Industrial Services (Margen) has been appointed by Eskom Holdings Limited (Transmission Services) to undertake the required environmental impact assessment work that will enable Eskom to construct lines from the power station. Margen appointed PBA International (SA) (PBAI) to assist with this process. The project is being run in parallel with the Matimba B (Medupi)-Marang EIA and makes use of a single Public Participation Process.

**Note:** All comments received on the EIR for Public Review have been incorporated into this final version of the EIR that is submitted to the authorities for consideration and approval. This final version of the EIR is also made available to the public for viewing.

### 1.1. DETAILS OF THE EAP

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### 1.2. EXPERTISE OF THE EAP

Please refer to **ANNEXURE I-3**, **ANNEXURE I-4** and **ANNEXURE I-5** for the respective CVs of the applicable project manager, project reviewer and public participation manager.

### 1.3. ENVIRONMENTAL AUTHORISATION RESPONSIBILITIES

The study area falls in the Limpopo and North West provinces. See **ANNEXURE IV-3**. The lead authority is the national Department of Environmental Affairs and Tourism (DEAT) who will issue the final Record of Decision (RoD) for this EIA-project. The EIA-project reference numbers within each provincial office are listed below.

**Table 1.1 – Environmental Authorities and Case Numbers**

Environmental Authority	Matimba B (Medupi)-Marang
National Department of Environment Affairs & Tourism (DEAT) = Lead authority	12/12/20/793
Limpopo Department of Economic Development, Environment and Tourism (L-DEDET)	16/1/4-79
North West Department of Agriculture, Conservation, Environment and Tourism (NW-DACET)	EIA 689/2005 NW

### 1.4. SUMMARY OF THE EIA PROCESS AND PROGRAMME

The EIA process followed is in accordance with the EIA Regulations as promulgated in terms of the Environment Conservation Act no. 73 of 1989. For the purposes of this report the process will not be explained in any detail as it has already been explained during the PPP for scoping and all participating parties are expected to be aware of the required and applicable processes. In addition to this the relevant authorities will not require an explanation of the process in order to make any informed decisions.

As far as the programme is concerned, dates are either dictated in terms of the consultant's planning or the applicable legislative requirements and outcomes of the various public participation stages. This also means that the future dates indicated in this report could change and should only be considered as a guideline.<sup>•</sup>

**Table 1.2 – EIA Programme**

Activity	Initial Target date	Actual completion
Submission of Plan of Study for Scoping	March 2006	6 March 2006
Approval of Plan of Study for Scoping	April 2006	12 June 2006
Submission of Scoping Report for public comment	July 2006	6 September 2006
Submission of Scoping Report to DEAT & Provinces	August 2006	15 November 2006
Authority approval of Scoping Report & PoS-EIA	September 2006	20 March 2007
<b>Proposed new date</b>		
Specialist studies	September 2006	11 April 2007
Submission of EIR for public comment	October 2006	15 June 2007
Submission of EIR to DEAT & Provinces	November 2006	September 2007
Record of Decision	December 2006	November 2007

<sup>•</sup> The consultant and/or the applicant is not responsible for the changing of proposed dates as indicated in this report or any effect that this might have on any person, party or organisation.

## 2. APPROACH TO THE STUDY

A full EIA process is run for the project. This includes:

- The Scoping Phase – approved by the authorities by late March 2007, and
- the EIA Technical Assessment Phase – now targeted for approval by the authorities by the end of November 2007.

Both phases include extensive public consultation and this process is described in **Section 5** of this report. The full EIA process is being carried out in accordance with Regulations 1182 and 1183 (1997) of the Environment Conservation Act No. 73 of 1989, and within the principles of the National Environmental Management Act No.107 of 1998. From the onset of the EIA-project, the consultant has been intent on undertaking an integrated EIA (including the Scoping) process for the Matimba B Transmission Integration Project (1 X 400kV Matimba B (Medupi)-Marang power line and 2 X 400kV Matimba B (Medupi)-Dinaledi power lines) whereby two separate applications were launched for each of the transmission links. This also meant that two separate plans of study for scoping (PoSS), Scoping Reports (SRs) and Plans of Study for EIA (PoS-EIA) were submitted, one for each of these links.

The public participation process (PPP) has, as indicated in the PoS-EIA, to date been conducted as a single process whereby all identified interested and affected parties were consulted with simultaneously. It is still planned that the lead authority will issue two separate RoDs for the two EIAs based on the two separate EIRs that will be submitted.

The scoping phase was used to research the study area and identify those issues relevant to the study. The SR was intended to set out the issues identified and how these would be taken forward into the EIA phase. In essence the scoping phase was used to attempt a 'scoping out' of the initially proposed corridors for the power lines and, where reasonable, areas within the study area that would not be environmentally suited for placing the transmission power lines. The EIA phase investigated key issues in more detail, with specialist studies undertaken as identified in the scoping phase and indicated in the PoS-EIA. The PoS-EIA also set out the intended approach to the EIA phase and was submitted to the authorities after completion of the scoping phase.

The project lies within two provinces; Limpopo and North West. The National Department of Environment and Tourism (DEAT) is understood to be the decision-making authority on all transmission projects above 132kV in size. However, the EAP undertakes to copy all correspondence to the offices of the provincial authorities and will invite the case officers to all meetings, site visits, etc. that involve authority participation. The timelines and deliverables on this project are critical to the overall project timelines. The achievement of these deadlines will require that the EAP adheres to deadlines, and also that the authorities assist in minimising document review timeframes. To date several delays have caused an overall delay of approximately eleven (11) months for this project.

Initially the consultant determined a study area for the purposes of the scoping phase of which the boundary was determined based on the most extreme boundary area within which the power line routes as proposed by Eskom Transmission could cost-effectively and within reasonable technical ability, not entailing excessive cost, be placed. The consultant further appointed a number of specialists to conduct studies mainly focussed on rating the potential routes as indicated by Eskom in order of preference and based on the specific findings of each individual specialist study. This information was used mainly as a guidance to focus efforts towards a final route option with at the most, one or two alternatives, thus resulting in one, two or three most preferred routes for each power line.

For the purposes of presenting the study area and possible corridors to the public, each of the route options were indicated on a map as 5km wide route corridor options. Various maps were viewed by the public but the intention was always that there should be an understanding that the routes could in theory be placed anywhere within the study area.

At the end of the scoping phase a most preferred route option was determined for most of the distance between the proposed Matimba B (Medupi) Power Station and the applicable substations, splitting into as much as three route options closer to the Spitskop Substation area. During the technical EIA phase these route options were carefully considered by the EIA team to further determine their preferences in relation to each other, thus establishing a single route corridor along the entire distance between the required connection points that was further considered by the relevant interested and affected parties during this phase.

Prior to completion however of the EIR for public review, an environmental action group from the Makoppa area raised their specific issues by means of their own proposal for placing the lines through their area of support and representation. The proposal was included into the routes for consideration during the public review process and is indicated on existing maps. In considering this route the consultant also corresponded with Eskom's technical team to determine what the proposed route would entail as far as financial and technical impacts are concerned and also considered the apparent environmental impacts that could be expected from this proposed option.

Further studies were also conducted to determine what the applicable separation distances between existing power lines and the newly proposed lines should be and where the best location for the actual placing of the lines would be. This final design is proposed as the transmission power line placement that Eskom Transmission will follow. Note however that it is proposed that the approved route will further be walked by the relevant specialists to finally indicate the most preferred exact placing of the power line pylons based on these on-site specialist findings.

For this reason the EIR indicates two 55m wide servitude zones on the map as well as an additional 500m wide movement zone on either side of the outer boundaries of these servitude zones to allow for any slight movements in the proposed servitudes after the RoD had been issued, should specialists find any on-site problems that would require any pylon re-placing or should the negotiator become aware of or negotiate any such a power line re-placing.

Servitude negotiations need to be considered and it is possible that individual landowners will have requirements or preferences for exact line placements on their land which will be negotiated with the Eskom negotiator after issuing of the RoD. This means that some leeway is required as to the final commitment of a servitude route and therefore a further requirement to have the 500m movement zones on either side of the proposed transmission power line servitudes.

The following was proposed in the PoS-EIA:

During the EIA phase all activities will be conducted according to a stringent time frame in an attempt to ensure a positive record of decision by early July 2007. The general aim of this phase of study will be to determine the best possible placing of the proposed 400kV power line within the 5km wide proposed route corridor. Two levels of assessment or feedback will be utilised in order to achieve this.

**Firstly** the public participation process initiated during the scoping phase will continue unrestricted for the duration of the EIA process. Stakeholder participation will continue until the EIR is compiled after which the EIR will first be made available to the public for review and then it will be amended as necessary and finally submitted to the relevant authorities for review and approval.

The feedback received through this process will be utilised to further inform and tailor the project design as far as the placing of the power line is concerned. Feedback from potentially affected land owners within the EIA study area regarding land use and planning activities will be of specific concern and therefore focussed on by the relevant specialist(s) and the PPP team.

**Secondly** the appointed environmental specialists will determine areas of sensitivity in more detail as explained in the terms of reference. The general aim will be to determine areas along the route corridor where line placing should be avoided at all cost if little or no mitigation to the extent of absolutely minimising an impact would be possible.

The EAP is intent on identifying and informing all land owners within the study corridor as well as their neighbours of the alternatives.

In addition to the above there will also be full consultation with landowners adjacent the Marang substation and technical environmental assessments will be conducted for the applicable expansions of the substation.

The study will also aim to generally indicate areas where construction camp placing would be problematic or unwanted and areas most suitable for such camps. The study will indicate where potential power line faults could be expected and propose mitigation measures that could be considered.

Finally the EIR will include proposals for mitigation during the various phases of the project as well as environmental issues that would have to be further addressed as part of the environmental management plan.

The following specialist team members will be involved during the technical EIA phase:

<b>Anita Bron</b>	-	<b>Sociology</b>
<b>Chris Van Rooyen</b>	-	<b>Birds</b>
<b>Liana Müller</b>	-	<b>Aesthetics</b>
<b>Dr. Julius Pistorius</b>	-	<b>Archaeology</b>
<b>Riaan Robbeson</b>	-	<b>Floristic</b>
<b>Jean Beater</b>	-	<b>Heritage</b>
<b>Jacques Boonzaaier</b>	-	<b>Geography &amp; Environmental Management</b>

The following has been required by the DEAT upon approval of the SR & PoS-EIA:

- A public participation process that satisfies the requirements of Government Notice R. 1183 and gives the public ample opportunity to assess the draft EIR for comments. Special effort should be made to ensure that all the possibly affected landowners have been informed about the process, especially those in the finally proposed corridor.
- Ensure that all issues raised during the scoping phase is addressed and assessed in the EIA phase of the study.
- Information regarding the effects of electric and magnetic fields (EMF) on the environment. (Please see **ANNEXURE I-2A**).
- A detailed socio-economic assessment of the effects on land use, land value and possible loss of jobs by workers on the farms where such a large number (4-5) of power lines will run parallel.
- Detailed design drawings of the proposed extensions at the substation as well as the area affected at the substation to accommodate the new power lines.
- Written comments from relevant Local, Provincial and National Authorities on the EIR.
- Written comments from SAHRA, SANPARKS, WESSA and other NGOs on the EIR.
- A draft Environmental Management Plan (EMP) for the construction phase to give I&APs the opportunity to comment on the EMP.

## **2.1. OBJECTIVES OF THE EIA STUDY**

The scoping phase focussed significantly on public consultation to consider the study area and proposed project design with alternatives. The EIA study focussed more on determining technical and environmental transmission power line placement options within the proposed route corridors identified during the scoping phase by means of excluding zones of significant environmental sensitivity as well as zones or points of obstruction. Such zones or points were mainly based on findings of appointed environmental specialists.

The EIR also aims to finally consider feedback from the public to help inform the project design and ultimate lead authority decision-making, confirm the need for the project, describe the latest project design findings and environmental findings, describe the methodology utilised in conducting the study, comparatively assess alternatives, indicate specialist findings and proposals, consider cumulative impacts and clearly indicate all assumptions, uncertainties and knowledge gaps.

The objectives of this EIA study were to:

- further identify relevant interested and affected parties (IA&Ps) and/or stakeholders for the proposed route corridor options that could not be identified during the scoping phase;
- further inform the above parties as well as the general public of the corridor route area about the proposed project to date;
- provide a further opportunity to these parties to raise issues and concerns pertaining to the proposed development and to provide feedback and help inform the project and process design for finalisation in the final EIR;
- further identify potential fatal flaws (impacts that cannot be mitigated to environmentally acceptable levels and render the project environmentally unfeasible);
- consider all available further specialist and technical data in order to determine areas of least environmental suitability for placing the transmission power line within the proposed route options;
- address the requirements of the DEAT received in reply to the proposed PoS-EIA and the SR;
- address the issues raised during the scoping phase by means of focussed detailed studies in the EIA phase; and
- provide sufficient information to the authorities so as to help inform their final decision-making.

## **2.2. SCOPE OF WORK**

During the EIA study the following activities occurred and will be finalised:

- Arrangements were made for the specialists to conduct additional specialist studies based on the information gaps identified during scoping and completion of the studies to inform the EIR;
- further arrangements were made for meetings with key stakeholders, including municipalities, farmers' associations and unions and various other representative organisations to discuss the EIR;
- further compilation and management of the database of participating parties and landowners;
- consideration of comments on the EIR and compilation of a final EIR;
- making available of the final EIR to the public;
- submission of a final EIR to the relevant authorities; and
- advertising and handling of the RoD.

### 3. DEVELOPMENT PROPOSAL

This section gives an explanation of the applicable project aspects for this project including some of the key technical details that would typically be required for the public to understand what the project entails and to help enable the relevant authorities in being able to finally make an informed decision on whether the project should be approved.

#### 3.1. PROJECT LOCATION

Please refer to **ANNEXURE IV-3** for an indication of the project location and extent, including the transmission line corridor options considered during the technical EIA study.

#### 3.2. PHYSICAL ELEMENTS OF THE PROJECT

The following is a description of the physical elements of the proposed project.

##### 3.2.1. Power Lines

For both the Marang 400kV power line the tower design will be the already used standard self-supporting cross-rope suspension tower for power lines over normal terrain and for sufficiently straight and level alignments. Currently this option is the most cost effective and environmentally suitable option. Note however that Eskom continually researches new pylon or tower designs most specifically aimed at achieving improved performance in terms of the conflicting demands of cost saving (through material reductions, greater ease of construction and transport and durability) and environmental friendliness (through improved aesthetics, reduced impact on avifauna, improved safety and maximised sustainability of function).

Strain towers will likely be utilised where difficult terrain is encountered or line deviations of more than 3° is unavoidable. The same applies as indicated above for environmental and economic performance but strain towers are much more restricted in terms of design options. The following are examples of the expected towers/pylons to be used:

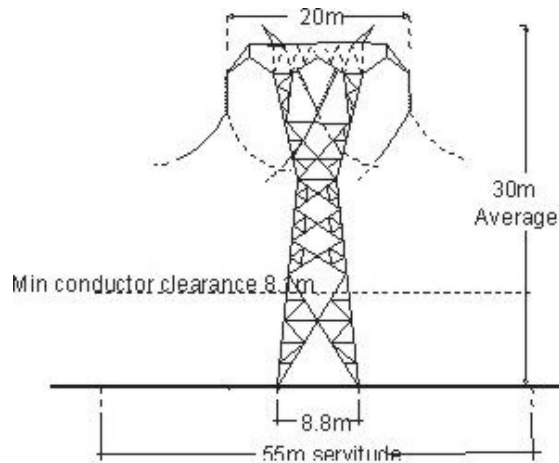
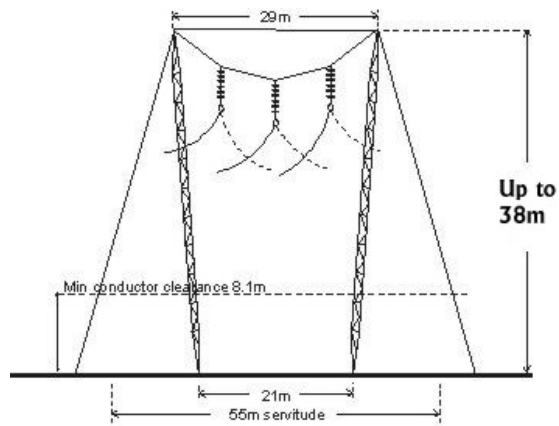


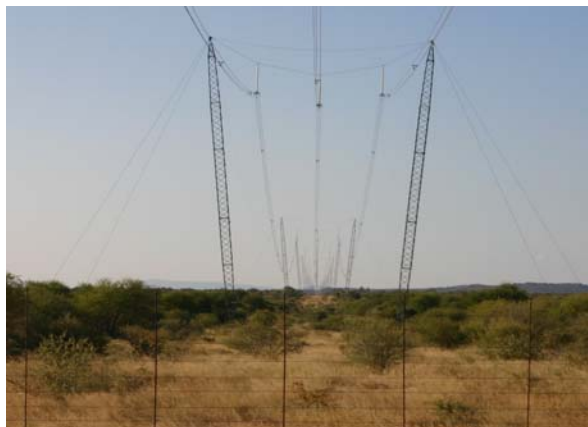
Figure 3.2.1.1 – Strain Tower: 400kV Line



**Figure 3.2.1.2 – Cross-rope Suspension Tower: 400kV Line**



**Plate 3.2.1.1 – 400kV Transmission Power Lines (Cross-rope Suspension & Strain Towers) crossing Distribution Power Line**



**Plate 3.2.1.2 – 400kV Transmission Power Line with Cross-rope Suspension Tower**

The standard servitude size for 400kV transmission power lines is 55m and Pylons are placed between 350m and 500m apart over the power line length depending on terrain and route angles. Note however that where self-supporting strain towers are used, the distance between such towers could be as little as 150m. Eskom Transmission obtains a right of use over the servitude area that allows the company to utilise the servitude land for purposes of electricity transmission to the approved design and technical constraints as approved by the relevant authority in terms of a RoD to be issued in terms of the relevant legislation and pertaining to the environmental impact report (EIR).



The conductor height is specifically aimed at ensuring the potential of being affected by human activities or even natural occurrences would be safely minimised and additionally that electromagnetic fields are kept as far away from potentially affected people, animals and vegetation as reasonably possible, based on current knowledge of the effect that these conductors could have.

The standard servitude size for 400kV transmission power lines is 55m and Pylons are placed between 350m and 500m apart over the power line length depending on terrain and route angles.

Eskom Transmission obtains a right of way over the servitude area that allows them to utilise the servitude land for purposes of electricity transmission to the approved design and technical constraints as approved by the relevant authority in terms of a RoD to be issued in terms of the relevant legislation and pertaining to the environmental impact report (EIR).

The right obtained by the company also entails certain restrictions on land owners over whose land the servitude is secured as well as allowances. These would include restrictions on and/or allowance of certain activities within the servitude area in terms of a contract reached between the applicable landowner and Eskom Transmission.

The following are examples of restrictions<sup>•</sup>:

- No building of houses, sheds or similar constructions that could affect or be affected by the power line and pylons.
- No blocking of access to the servitude area that would deny Eskom maintenance operators any possibility of entering and/or servicing the servitude area.
- No utilisation of irrigation points within the servitude area.
- No blasting or excavating within the servitude area without prior approval from Eskom.

The following are examples of allowances<sup>•</sup>:

- Grazing and dry-land cultivation activities within the servitude area.
- Vegetation clearing and animal movement within the servitude area.
- Placing of topsoil berms not exceeding certain dimensions under the power lines or within the servitude area.

Eskom also has the ability to “customize” tower features according to certain specific local conditions where applicable. Towers could be heightened and the space between two towers increased where for instance significant river, dam or wetland crossings are unavoidable or where human structures or activities such as centre pivots for irrigation exist. Such customizations are normally negotiated with the specifically affected landowner(s) potentially affected.

Power line infrastructure will be most visible when new just after installation but will lose its shine over time so that it becomes less visible and normally blends in better with the natural background of the area where it has been established. The cross-rope design is especially successful in this regard and with the exception of any strain towers, is likely to be only visible when directly encountered or to the trained eye specifically attempting to find these towers from a distance. Observations have shown that this type of tower, even on a clear day would not be visible for more than 5km to 10km even in open and flat areas.

<sup>•</sup> These are only examples of restrictions and should not be considered to be any indication of what the actual contractual agreements would be relating to this project. None of the examples indicated here will necessarily be applicable.

<sup>•</sup> These are only examples of allowances and should not be considered to be any indication of what the actual contractual agreements would be relating to this project. None of the examples indicated here will necessarily be applicable and the examples are by no means a commitment of any kind by Eskom Transmission.

### 3.2.2. Marang Substation Expansion

The HV yard is built with **tubular busbars** in order to minimise the visual impact of the substation on the surrounding area as well as to coup with the amount of injected and through power the busbar systems is required to support. The 400 kV busbar system comprises two normal running busbars (No.1 and No.2), as well as a third busbar that acts as the Transfer/Bypass busbar. This is a standard arrangement in order to obtain the low impact effect. The two running busbars cater for 4 zones of busbar with the installation of a full bus section in the No.1 and No.2 busbars, completed by two bus couplers at the ends to provide for a closed ring. The Transfer/Bypass Busbar is to be solidly connected to the No.2 busbar to form the bypass path.

Double zone outages can result from stuck circuit breaker pole or current transformer failures in the bus couplers and bus sections, faults in the so called “end zone” of the said bays, and bus coupler and bus section circuit breaker pole discrepancy. If feeders are selected onto adjacent zones, any one of these modes of failure will result in more than one feeder tripping. It is therefore necessary to separate the feeders from the power stations and same general destinations by 2 circuit breakers. Hence Matimba 1 and Matimba ‘B’ (Limpopo) 1 are selected such that they are separated by two circuit breakers. The Bighorn 1 and Midas 1 feeders can by default also be selected in this manner.

The 400 kV Marang system will be comprised of the following bays:-

- 1 x fully equipped feeder bays with double busbar selection and bypass (Limpopo 1).

#### Main Electrical Components of the Expansion:

System Voltage (kV)	Rupturing Capacity (kA,min)	BIL (kV,min)	Creepage (mm/kV,min)
400	50	1425	20

#### **400kV Yard**

##### **FEEDER 1 (LIMPOPO 1)**

##### **Primary Plant**

- 1 x 400kV Isolator 1ES LH 3150A 50kA 110V DC Aux. (Motorised) 20mm/kV
- 1 x 400kV Pantograph Isolator 0ES 3150A 63kA 110V DC Aux. (Motorised) 20mm/kV
- 1 x 400kV Circuit Breaker 3150A 50kA 1ARC 110V DC Aux. 20mm/kV
- 1 x 400kV Isolator 1ES RH 3150A 50kA 110V DC Aux. (Motorised) 20mm/kV
- 1 x 400kV Pantograph Isolator 0ES 3150A 63kA 110V DC Aux. (Motorised) 20mm/kV
- 3 x 400kV CT 3150A 50kA 6C (3200/1 2P 2M) (1/1600 2BZ) 20mm/kV
- 1 x 400kV Earth Switch 3ph 50kA 20mm/kV
- 2 x 400kV LT 50kA 20mm/kV
- 3 x 400kV CVT 20mm/kV
- 3 x 400kV Surge Arrester Metal Oxide 20mm/kV
- 17 x 400kV Post Insulator C6-1425 20mm/kV
- Labels
- Bull Conductor

#### Main Civil Works of the Expansion:

Provide main column, equipment foundations and cable trenches in 400kV yard as per Foundation and Trench Layout and Bay Layouts. Steelwork for primary plant and support steelwork for stringers is to be provided. Clear yard stone in the area of foundations, stockpile and replace.

Please see **ANNEXURE IV-7C** for details on the layout planning.

### 3.3. PROJECT MOTIVATION AND BACKGROUND

The following is a description of the general aspects and planned purpose of the proposed project indicating the relevant motivation and alternatives.

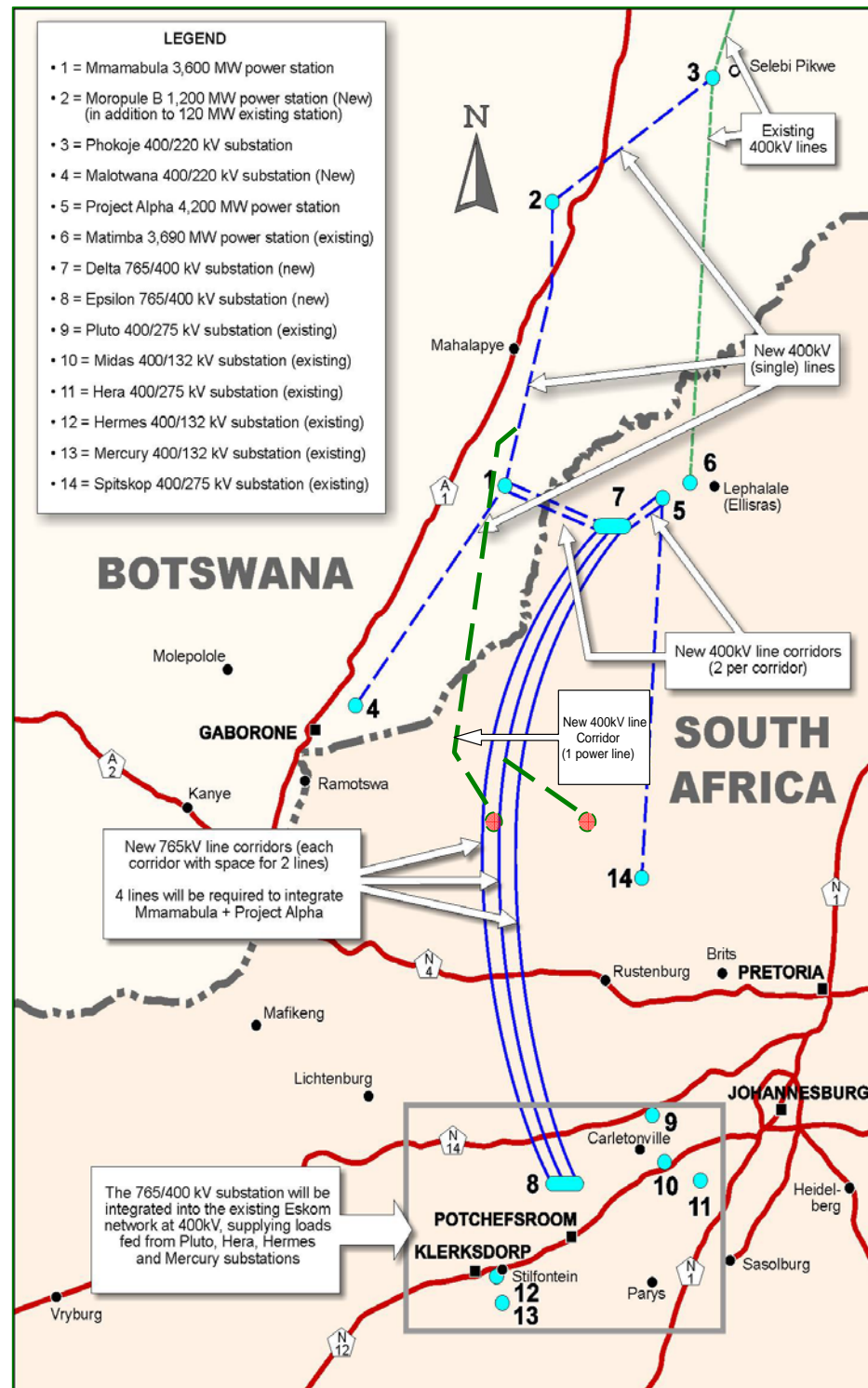


Figure 3.3.1 – Basic Layout of Generally Planned Matimba B and Mmamabula-Matimba Transmission Integration Planning (As provided by Eskom & CIC Energy)

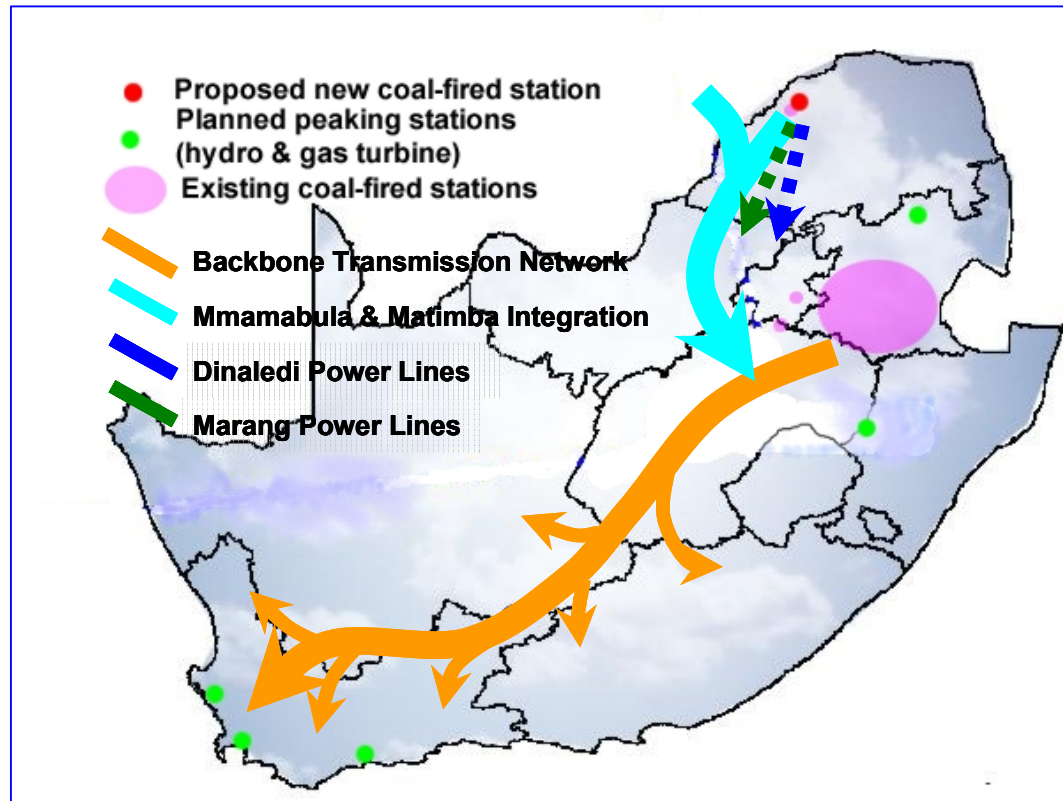


Figure 3.3.2 – Basic Indication of Generally Transmission Requirements for South Africa

### 3.3.1. Generation Expansion

Consider **Figure 3.3.2**. As indicated in the figure the existing coal-fired stations in South Africa is located mostly in the coal fields of the Mpumalanga Highveld. In recent times it has however become clear that these coal fields are nearing exhaustion in as few as the next 20 to 30 years and shortages in stable supply are already being experienced.

At the same time the South African economy has shown significant growth that exceeded the expectations of many economists and large service providers in the country, especially Eskom in providing sufficient electricity to all South Africans and South African Business and Industry.

Due to the expected further growth and keeping in mind the significant additional incentives the government plans to implement towards an even greater increase in growth rates, the expected future electricity demand in the country is expected to place significant pressure on Eskom in coping with and supplying this demand safely, effectively and in a sustainable manner.

Luckily one possible part of a solution for the above has already presented itself in the finding of significant coal reserves in the Lephalale area up to the border with Botswana and also an even larger area within Botswana.

Eskom is therefore in a position of addressing the expected shortages in electricity supply timeously by establishing new generation points in this area in the form of latest technology power stations with high yields and significantly lower pollution generation.

One such power station has already been established and another is expected to be established in the near future pending the final outcome of the relevant environmental studies. There are also definite plans for establishing one or more power stations in Botswana which would have the capacity to supply even more electricity to the SADC region, including South Africa. It is already known that a power station currently named Mmamabula is underway in Botswana.

In order to transport the generated electricity, transmission power lines are however required. This is mainly due to the fact that in recent times coal-fired power stations have not been placed near the point of demand, but rather close to the point of the main resource namely the coal deposits. This has been done for a number of reasons, mostly related to economic considerations but also to other factors such as stability and continuity of electricity supply where railways have become more costly and less reliable and road transport of coal is even more costly and potentially detrimental to the environment.

### **3.3.2. Transmission Network/Grid**

Please again consider **Figure 3.2.2**. As indicated on this figure, the backbone transmission network for the country has always been based on the availability of coal and accompanying electricity generation in the Mpumalanga Highveld area and the demand zones in Gauteng and the Cape regions.

The location of the Waterberg coal fields in the region of the Matimba power station near Lephalale is however so located that it is far removed from the established main transmission grid/network. This is due mainly to the fact that historically this area was not utilised for electricity generation and no significant consumers such as large industry or mining existed in this region.

This has brought about the need to now establish a transmission network expansion and link into the main grid from this newly developing generation area in order to ensure electricity levels are maintained in relation to the national demand, even as it grows, for the entire national grid.

The latest proposed approach in establishing this link is indicated graphically in some detail in **Figure 3.2.1** as well as in a more general and conceptual spatial representation in **Figure 3.2.2**.

### **3.3.3. Network Options in the Study Area**

Various network options have been considered during the feasibility studies by Eskom Transmission System Planning department. Due to the technical and elaborate nature of the study, it is not explained in any detail in this section.

It would suffice to indicate that different links between Matimba B (Medupi) and the various substations located towards the south and especially south-east sections of the study area have been considered, also taking into consideration the planned possible transmission links that would be necessary between Botswana, Matimba and the main grid areas.

All indications are that alternatives that would involve the placement of transmission power lines outside the study area will entail significant additional costs as well as an excessive increase in physical land surface disturbance and potentially an excessive increase in cumulative environmental impacts. Alternatives that would entail placing the power lines outside of the study area are therefore considered to be neither viable nor environmentally acceptable in general.

In addition to the above the majority of the area to the east of the study area hosts the Waterberg Biosphere which is an internationally recognised biosphere. This would render the placing of the lines through this zone more damaging to the environment from a cumulative point of view in addition to the already increased overall environmental impacts caused by the increase in power line distance alone.

### 3.4. PROJECT PROGRAMME

It is necessary for Eskom Transmission to establish the necessary transmission links by the time the new power station is operational and this is planned to occur by 2010. The EIA process is envisaged to produce a result no later than late 2007 and this would mean that servitude negotiations will have to be finalised towards the end of 2008.

The construction of the line will take approximately two years so that it is completed towards the end of 2010. The project is of significant strategic importance to the country and therefore any delays in the project programme is expected to have potential negative consequences from an electricity supply point of view in various areas of the national grid.

### 3.5. PROJECT ALTERNATIVES

Various grid connection alternatives have been considered, both by Eskom Transmission and the appointed environmental consultant. Based on the best technical option for linking the entire grid to the Matimba complex, connection points were determined. These were determined to be the Marang substation by means of a single 400kV transmission power line and the Spitskop and Dinaledi substations by means of two 400kV transmission power lines connected to each substation.

After having considered the transmission network planners' connection options, Eskom Transmission's Land and Rights department determined the technically most-suited routes, from an Eskom point of view, for the required 400kV transmission lines to be able to link up with the various substations as indicated by the planners. The consultant has further considered these initially proposed routes as well as the economic and physical constraints for making the project viable in determining a study area and utilising the proposed routes as initial indicator corridors.

During the public participation process for the scoping phase, the consultant already indicated possible alternatives for the corridors which were also proposed to the public on various maps and which generated significant feedback from the PPP participants. Based on the initial feedback from the PPP and general specialist field assessments during scoping, it was also possible to determine a number of potential problem areas as well as areas that could be improved in terms of design and alternatives in order to minimise or mitigate environmental damage.

The normal consideration of route alternatives is applicable and has been implemented as part of this study. The consultant has refined this approach by establishing a spatial assessment system whereby various environmental impact factors are mapped to act as an additional indicator of potentially most-suited route options. This was already conducted during the scoping phase for the entire study area and produced successful results that could be used as a power line placement guide early on.

After completion of the Scoping phase but during the continuation of the PPP a representing environmental group from the Makoppa area requested additional discussions with the EIA project manager and proposed a further route consideration through the Makoppa area. This option was also considered and included as a further route alternative for consideration during the EIA. During the technical EIA phase several additional route alternatives were proposed either by individual landowners, key stakeholders and representing participants such as Duard Barnard as mentioned earlier in this report. These options were also considered and included as route alternatives to be considered or as options previously investigated and therefore not considered to be viable. Please consider **ANNEXURE IV-3** in this regard.

#### 3.5.1. The 'No-Go' Option

The no-go option for this project is not considered to be applicable in terms of total project go-ahead. In the technical specialist assessment for scoping it has been determined that the social and economic benefits that the project would have, is of greater significance than any of the negative environmental impacts.

Even if a combination of or cumulative impacts exist that would outweigh this total benefit, such impacts would only occur within their applicable smaller spatial zones or areas in the study area and it would be possible to place the lines away from such areas or at least to apply sufficient mitigating measures to ensure this.

Where a project is of the level of strategic importance such as which is applicable to this project, where in fact the electricity supply and therefore the economy of the entire country is affected, it is held that none of the known negative impacts would be a sufficient argument for a total “no-go” scenario.

This issue has already been considered during scoping and no new information or facts have arisen in the meantime that would indicate that a “no-go” scenario would be applicable.

### **3.5.2. Other Project Alternatives**

A number of other project alternatives have been identified previously in other EIA studies as alternatives that require consideration. These alternatives were also raised in general by the public during the PPP to date for this EIA. These include the consideration of placing transmission power lines underground, alternative means of generating and transporting electricity and the utilisation of alternative forms of energy to name just the key issues.

Currently South Africa's economy is based on the availability of amongst other resources, the availability of low cost electricity. The availability of this resource is one of the advantages that the country has at its disposal to enable international economic competitiveness. This is important in the sense that economic competitiveness ensures economic survival, perhaps the most important component in ensuring the country's ability to develop on all fronts and to reduce poverty and economic and social inequalities.

Poor and underdeveloped countries are known to also have the most significant problems with regards to environmental and social degradation and fiscal ability is directly linked to social and environmental ability.

This means that even if other sources of electricity or energy is available to the country in theory, the economic, social and environmental costs of transforming entire industries and an establishes supply system is potentially devastating and can only be implemented over the long term. The shorter term demand can only be addressed by means of the upgrading of the current system.

Eskom continually spends significant amounts of money and time in researching alternative energy generation and supply alternatives in a drive to enable such a transformation, but in the meantime, while many of these new technologies and approaches are being researched, introduced and implemented, it is necessary to utilise the available technologies and available resources and infrastructure.

The research conducted also takes place on two fronts namely improvements in utilising currently available resources and new and alternative resource and technology alternatives.

Results of such research is already evident in the significant improvements visible in latest power line and pylon designs as well as much improved coal fired power stations where electricity generation is much more sustainable and stable and air pollution levels as well as water usage have been reduced enormously.

Eskom has also conducted viability studies on placing electricity transmission lines underground. Results to date indicate costs to a level that would increase electricity costs to unacceptable levels. The infrastructure required to be able to undertake this would be costly, difficult and more dangerous to service and significant environmental and social costs are still applicable.

Underground transmission power lines are more exposed to feedback impacts from natural occurrences such as flooding and geological shifting. The cost of undertaking such a project is believed to outweigh any environmental benefits at this stage. Please consider **ANNEXURE I-2B** in this regard.

No-go Areas:

It is acknowledged that areas of “no-go” for the placing of the applicable electricity transmission infrastructure could and most likely would exist. Such areas are addressed from three points of view:

**Firstly**, any areas indicated as “no-go” areas at the onset or at any other stage of the EIA process by the relevant lead authority. In the case of this study the relevant provincial authorities indicated that all national parks and registered nature reserves should be considered as no-go areas.

**Secondly**, the participating environmental specialists are burdened with identifying such areas that would be identifiable during the scoping and technical EIA phases. The status of “no-go area” could be based on specific legal restraints such as the legal protection of certain protected areas against certain developments within such areas or on the professional opinion of a specialist provided that such opinion is verifiable in terms of certain scientific criteria and guidelines which the specific specialist must produce proof of.

**Thirdly**, and in addition to the above Eskom Transmission would also establish criteria for areas that could be considered as “no-go areas” under specific conditions or with certain exemptions. This could be based on the expected cost of disturbing such areas, be it a financial or social cost and the legal and social responsibilities the company perceive to be applicable.

Eskom Transmission would for instance prefer not to cause unnecessary relocation of people from established or informal settlements wherever possible and could indicate to the consultant that such areas need to be indicated as “no-go areas”.

“No-go areas” are also considered in different ways during the scoping and technical EIA phases. During scoping only areas that would affect the placing of the preferred route(s) are considered whereas more specific detail land use activities and physical occurrences such as the location of irrigation points or archaeological sites are only determined during the technical EIA phase.

During the scoping phase a complete assessment of the potential impacts from the proposed activity on the environment was conducted for the power line.



#### 4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The majority of the land in the study corridors (around Spitskop and north of Spitskop) is privately owned and managed. Many of these properties feature game farms, with the remainder comprising of agricultural land. The more southern section of the study corridors features some community settlements and mostly agricultural land under land claims. The towns of Lephalale, Steenbokpan, Sentrum, Thabazimbi, Dwaalboom, Northam, Rustenburg, Marikana and Brits are some of the better known towns near the study corridors.

The sections to the north also fall within an area where few formal settlements and almost no residential areas exist. Closer to the Marang substation however the study corridor runs through a number of informal settlement areas and land portions are generally smaller. The western option is especially difficult due to the existence of significant mining and residential areas with planned expansions of mining areas. This area also carries a number of existing power lines of various types and sizes.

See **ANNEXURE IV-3** for an indication of the study corridors and study area dimensions.

The Eskom Project Area incorporates a northern bushveld savanna ecozone that stretches from Lephalale in the north to a series of norite kopjes in the south. The Bankeveld is an intermediary zone between the northern bushveld and the grass veld of the Highveld stretching further to the south. The northern bushveld and the Bankeveld ecozones do not only harbour significantly different types and ranges of heritage resources, but also reflect marked differences in the number of heritage resources that occur in each of these ecozones.

The study area falls within an area popularly known as the 'bushveld'. Surprisingly little is known about the vegetation in this area as most studies have been done in nature reserves and game farms, but five major regions are present, three of which is represented in the scoping study area. Sweet Bushveld occurs on fertile soils in the dry and hot valleys of the Limpopo River and the thorny, small-leaved vegetation is dominated by *Acacia* species that increases to dense, impenetrable thickets at the expense of the grass layer when over utilised. Mixed Bushveld varies from short, dense bushveld to a rather open, tree savannah.

The Waterberg moist mountain bushveld is a typical example of moist, infertile savannah. Due to the high proportion of unpalatable grasses, the area has become known as 'sour bushveld'. An interesting phenomenon is the presence of many plant species showing affinities with the flora of the Drakensberg, which indicated an ancient link with this range.

The savannah biome is populated by a greater diversity of bird species than any other biome in South Africa. The presence of both woody plants and a well developed herbaceous layer provides diverse sources of food and shelter for specialist and generalist bird species, including seed-eaters, insectivores and diurnal and nocturnal birds of prey abound. Much of the area is used for game farming and big game hunting, illustrating that utilization and conservation of an area are not mutually exclusive. ***The savannah biome is the core of the wildlife, ecotourism and meat-production industries.***

The power line route variants are situated within the Limpopo Primary Catchment area. The major rivers are the Krokodil and Moretele Rivers. Numerous perennial and non-perennial streams also exist in the area.

The Lephalale area is defined mostly by its farming gaming and ecotourism areas although the establishment of more mining and industrial areas especially linked to the identified coal fields to the north and west is expected to change the physical, economic and social landscape of this area over the next couple of decades.

Thabazimbi is a town with mixed characteristics inherited from its nearby mining areas and further surrounding game farming, domestic farming and tourism related land use areas. Mining, the main source of economic stimulation, is reportedly on the decrease and the municipal management has recognised that the economic survival of the town is dependent on future tourism and eco-tourism related developments, including the establishment of future exclusive resorts and eco-developments.

Rustenburg is the only classified city near the study area and is also considered to be part of the growth zones where electricity demand is on the increase. The city is typical of a growing South African city with areas of significant settlements both upper class towards the central zone and informal, in the case of Rustenburg, towards the north mostly and nearer to the industrial areas almost adjacent the city centre and the significant mining areas stretching mainly east towards Brits.

The N4 national main route runs through the city and the internationally famous Pilanesberg National Park and adjacent Sun City is located to the north of the city. The city further serves as the main business and social centre for most of the traditional communities located to the north, north-east and north-west of the city.

The Marang substation is located on a flat plain in an area that can best be described as a mixture between industrial and rural with some settlement areas within a 10km range from the site itself. Most of this area is being developed for mining purposes although some cultivation and significant grazing activities still occur within the surrounding areas. Marang is also located close to an area that is well known for its archaeological status but the substation itself is located away from most of the archaeological sites in the area. No archaeological, cultural or historical sites could be observed around the substation and no sensitive landscapes are known to occur nearby. The site is flat and there are no rivers or streams nearby. A number of tar roads exist around the site but none of these are known tourist routes.

## 5. PUBLIC PARTICIPATION

Public Participation plays an important role in the Environmental Impact Assessment (EIA) process and the planning, design and implementation of any development.

Morgen Industrial Services conducted the Public Participation Process (PPP) for the EIA, including the Scoping Phase and the Environmental Impact Phase for the Matimba B (Medupi) Transmission Integration Project, involving as many potential interested and affected parties (I&APs) as possible. The comments received and issues raised during the process were collated first into the Scoping Report and then into the Environmental Impact Report and were used to assist the environmental consultant to determine possible impacts and mitigation measures for the project. The Matimba B Transmission Integration Project consists of two EIA projects, namely one 400kV transmission power line from Matimba B (Medupi power station - Lephalale) to Marang substation (Rustenburg) and two 400kV transmission power lines from Medupi power station to Dinaledi substation (Brits), via Spitskop substation (Northam). The PPP was conducted as one process for both these projects and I&APs were consulted for 3 x 400kV transmission power lines from Lephalale to the Marang and Dinaledi substations.

A registered I&AP is a person who has provided their contact details to Morgen Industrial Services and who is registered on the database. Registered I&APs receive project related information during the entire Environmental Impact Assessment process.

Public Participation is an integral requirement of the National Environmental Management Act (Act 107 of 1998) and the Environment Conservation Act (Act 73 of 1989). The process followed has taken into account all aspects of public participation as stipulated in legislation.

This report reflects the public participation activities conducted during EIA process. The EIR was available for public review from **Thursday 21 June 2007 to Friday 24 August 2007**. This report has now further been adapted to reflect the additional public participation activities conducted since the public review of the EIR.

### 5.1 Additional Public Participation Conducted

The Environmental Impact Report was finalised at the end of June 2007 and was distributed to the public for review and comments. This section will discuss and explain the public participation activities conducted to date.

#### 5.1.1 Notification to Public of Environmental Impact Report available for Review

Advertisements were placed in the following newspapers, announcing the availability of the Environmental Impact Report for Public Review. The advertisement consisted of three languages, i.e. English, Afrikaans and SeTswana.

Newspaper	Date	Area
Mogol Post	Friday, 22 June 2007	Lephalale
Kwêvoël	Friday, 22 June 2007	Thabazimbi and Northam
Brits Pos	Friday, 22 June 2007	Brits
Rustenburg Herald	Friday, 22 June 2007	Rustenburg

The advertisement indicated that the Environmental Impact Report would be available for Public Review from **Thursday 21 June 2007 to Friday 24 August 2007**. An additional review period was allowed as the comment period fell over the July School Holidays. Please see **ANNEXURE III-12** for a copy of this advertisement.

Copies of the documents were also delivered to all information points in the study area on Thursday 21 June 2007. Letters were sent out to all registered I&APs on the database informing them of the availability of the Environmental Impact Report. This letter also included the Executive Summary of the EIR. This letter was further e-mailed to all registered I&APs with e-mail addresses at the same time. Please see **ANNEXURE III-11** for a copy of this letter.

All potentially affected landowners also received a copy of a map with the letter showing the final proposed route alignment to ensure that landowner would comment on the project. The map and letter were also emailed to all affected landowners with email addresses.

#### 5.1.1 Consultation with Affected Landowners

The study area has been divided into five areas for easier report writing:

##### *Lephalale/Steenbokpan Area:*

A section of the Lephalale/Steenbokpan area also falls within the study area for the proposed Eskom Delta-Epsilon Project, as well as the proposed Mmamabula-Delta and the proposed Matimba B-Delta projects. For this project, public meetings and public open days were held in Lephalale and Steenbokpan on 13 and 14 April 2007. At this meeting and open day both projects were discussed. A number of I&APs affected by the Matimba B TI Project attended this public event. Please see **Annexure III-5** for a copy of the notes on these public meetings.

Flyers were also printed and delivered to all post boxes in the Lephalale and Steenbokpan area for these meetings. No feedback was received from this. Please see **Annexure III-4** for a copy of this flyer.

The Steenbokpan Environmental Forum was also established representing a number of landowners within this area and they are actively involved in consultation.

A meeting was held on 18 July 2007 with the affected landowners in the Lephalale area. All affected landowners within this area were invited to the meeting. Other landowners were however welcome to attend the meeting even if not affected by the final alignment. The meeting was aimed at presenting the findings of the EIR to them and also to give them an opportunity to workshop the final route alignment. Please see **ANNEXURE III-13** for a copy of the minutes of this meeting.

##### *Makoppa/Sentrum/Dwaalboom Area:*

A section of the Makoppa/Sentrum/Dwaalboom area also falls within the study area for the proposed Eskom Delta-Epsilon Project. For this project, public meetings and public open days were held in Makoppa and Dwaalboom on 7 and 8 March 2007. At these meetings and open days both projects were discussed. A number of I&APs affected by the Matimba B TI Project attended these events. Please see **Annexure III-6** for a copy of the notes on the public meetings for 7 and 8 March.

Four additional meetings were also held with Focus Groups in these areas. These were held on 4 April at Dwaalboom with the Dwaalboom FA, 16 April with the Makoppa Environmental Action Group, 17 April with the Sentrum FA and 14 May at Makoppa with the Makoppa Environmental Action Group. Please see **Annexure III-7** for copies of the minutes of meetings.

The Makoppa Environmental Action Group (MEAG) is a newly established group representing a number of landowners in the Makoppa, Sentrum, Dwaalboom and Thabazimbi area. They represent almost 300 landowners and are very involved with these projects. A meeting was held with them, arranged through their legal representative, Duard Barnard, on 5 July 2007. The MEAG proposed a route alternative that follows the roads in the Makoppa and Sentrum area. The purpose of the meeting was to discuss this alternative with the consultants and Eskom and determine if the route was feasible or not. Another meeting was held with them on Thursday, 19 July 2007 at Makoppa, which was attended by Eskom, their consultants and representatives from TAP.

Through consultation with Eskom, TAP (responsible for construction of the power lines) and the MEAG it was determined that this option was not viable due to an increase in the number of towers and steel that would be required.

Two meetings were held with affected landowners in the Sentrum and Makoppa areas. The first meeting was held in Sentrum on Thursday 19 July 2007 and the second meeting was held in Makoppa on Friday 20 July 2007.

The meetings held were to discuss the findings of the EIR with the directly affected landowners who had all been invited to the meetings. Other landowners were however welcome to attend the meeting even if not affected by the final alignment. Landowners were given the chance to view the maps and discuss these with the Eskom Negotiator and the consultants. Please see **ANNEXURE III-14** for copies of the minutes of the meetings.

*Northam/Thabazimbi Area:*

Flyers were also printed and delivered to all post boxes in the Northam area at the post offices. No feedback was received from this. Please see **ANNEXURE III-4** for a copy of this flyer.

A meeting was held on Wednesday, 1 August 2007 with the Northam Farmer's Association. Most of the affected landowners in the Northam area attended this meeting. The meeting was arranged through Prof Erasmus du Plessis, who requested the maps showing the final alignment and then arranged the meeting for the consultants to attend. Please see **ANNEXURE III – 15** for notes of this meeting.

*Rustenburg/Mankwe Area:*

A section of the Rustenburg area also falls within the study area for the proposed Eskom Delta-Epsilon Project. For this project, a public meeting and public open day was held in Rustenburg on the 14<sup>th</sup> of March 2007. At this meeting and open day both projects were discussed. A number of I&APs affected by the Matimba B TI Project attended this public event. Please see **Annexure III-8** for a copy of the notes on this public event.

Flyers were also printed and delivered to all post boxes in the Rustenburg area at the post offices. No feedback was received from this. Please see **Annexure III-4** for a copy of this flyer.

A number of the farms affected within the Rustenburg and Mankwe areas belong to Traditional Authorities. Consultation with Traditional Authorities is included under the Section Traditional Authorities. Some of the farms belong to the Government and they have received maps and project related information. No other meetings were held in this area.

*Brits/Ga-Rankuwa Area:*

Consultation has been poor with I&APs in this area. A number of factors seem to come into play. Many of the properties have land claims registered against them so landowners are not keen to participate. Farming activities in this area will also be able to continue in this area even if power lines cross the properties. The biggest concern from landowners in this area is with regards to compensation and maintenance and servitude issues. Many of the properties in this area also belong to TA's and these groups have been consulted with.

The consultants have also conducted additional activities in this area to ensure that all possible I&APs are consulted with. These activities include:

*Meeting with Atlanta FA:*

This meeting was held on 24 April and was attended by a number of landowners. The main issues from this meeting were servitude acquisition and compensation to be paid. Please see **Annexure III-10** for a copy of the minutes of this meeting.

**Flyers:**

Flyers were printed and delivered to all post boxes at the Madibeng Post Office. No feedback has resulted from the Flyer drop. Please see **Annexure III-4** for a copy of this flyer.

The consultants have tried to arrange another meeting with the Atlanta FA, but this meeting has not taken place. At the previous meeting held in April, most of these affected landowners' concerns were based on servitude and compensation issues, which will need to be negotiated with the Eskom Negotiator.

A number of farms also belong to Traditional Authorities and these TA's have been consulted with. A number of farms also belong to the Government and they have received maps and project related information. A number of game farms also fall within the Brits area, including Dikhololo Game Reserve and others. Feedback has been received from Dikhololo Game Reserve requesting that the lines run on the adjacent property. The lines are proposed to run along boundary fences in this area.

### **5.1.2 Consultation with Municipalities**

There are 4 municipalities in the study area for these projects, i.e. Local Council of Madibeng (Brits), Rustenburg Municipality, Thabazimbi Municipality, Lephalale Municipality.

Important to note at the onset is that all Senior Municipality Officials, as well as all Ward Councillors have been registered on the database for these projects, from the beginning of the project. All officials and councillors have therefore received all project related information, as well as invitations to public meetings and public open days, and other stakeholder workshops. They have also received all notices of reports that have been made available for public review.

A requirement of the Regulations for EIAs is that consultation is required with municipalities and local councils within the study area for the project. Initial meetings were arranged and held during the Scoping Phase of this project. Please refer to the original PPP Report published with the Scoping Report and the Addendum PPP Report for details on this consultation.

*Lephalale Municipality:*

A first meeting was held in August 2006. The request from the municipality at that stage was to be kept informed of the progress of the project and to schedule a second meeting with them once the Environmental Impact Report (EIR) is available for public review showing the final routes. This meeting has not taken place. Please refer to **ANNEXURE III-16** for the process followed to obtain a meeting with the municipality.

*Thabazimbi Municipality:*

A first meeting was held in August 2006. The request from the municipality at that stage was to be kept informed of the progress of the project and to schedule a second meeting with them once the Environmental Impact Report (EIR) is available for public review showing the final routes. A meeting with the municipality was scheduled for July 2007 which the consultants and Eskom attended, but due to a misunderstanding from the municipality, the meeting did not take place. Please refer to **ANNEXURE III-17** for the process followed to obtain a meeting with the municipality.

*Rustenburg Municipality:*

A first meeting was arranged for August 2006. This meeting was poorly attended by Municipal Officials. Since this meeting, numerous requests have been issued to this Municipality for a second meeting, but none has been held to date. Requests have been made to the Office of the Speaker, as well as the Chief Whip of the Municipality, but no meeting has been held.

At the first meeting that was held with a couple of officials, the request was also made that the consultants meet with the Municipality once the EIR is available for public review. This meeting has not taken place. Please refer to **ANNEXURE III-18** for the process followed to obtain a meeting with the municipality.

*Local Council of Madibeng (Brits):*

A first meeting was arranged for August 2006. This meeting was poorly attended by Municipal Officials. Since this meeting, numerous requests have been issued to this Municipality for a second meeting, and a date was set for a meeting on 7 May 2007.

Two members from the Consultants attended this meeting, and a presentation was given to the Municipality Officials and Councilors who attended this meeting. A set of maps was left with the municipality. Please see **Annexure III-9** for a copy of the minutes of this meeting.

At this meeting that was held on 7 May, the request was also made that the consultants meet with the Municipality once the EIR is available for public review. The municipality also requested that a copy of the maps showing the final proposed route alignment be sent to them. This was done. The meeting has not taken place. Please refer to **ANNEXURE III-19** for the process followed to obtain a meeting with the municipality.

### **5.1.3 Consultation with Traditional Authorities**

Numerous meetings were held with Traditional Authorities (TA's) during the Scoping Phase of this project. Meetings were held with:

Bakgatla Ba Kgafela TA; Baphalane TA; Bakgatla Ba Makau TA; Krokodilkraal Co-owners Committee Community Property; Royal Bafokeng TA.

These TA's requested that meetings be arranged with them once the EIR is available for public review. Such meetings were arranged during the EIA Phase of the project. All TA's are on the database for registered Interested and Affected Parties (I&APs) and have therefore received information relating to all scheduled meetings in the area to date and were updated on the project. TA's no longer affected by the project were not met with but will remain on the database and receive project related information.

The Medupi–Marang and Medupi–Dinaledi 400kV lines affect four traditional authorities and have all been consulted with during the Scoping Phase and the Environmental Impact Phase. The meeting attended by the North West House of Traditional Leaders agreed at the beginning of the study that only the affected traditional leaders need to be consulted with. The potentially affected traditional authorities were identified to be:

- The Royal Bafokeng
- Bakgatla ba Kgafela
- Baphalane Royal Council
- Bakgatla ba Makau
- Bakwena ba Mogopa

The above traditional councils were met during the Scoping Phase and the comments, concerns and issues raised were included in the Scoping Report. As indicated in the scoping report the main issues raised related to the question of job opportunities, strengthening of electricity in the area and compensation. Responses to these issues are covered in the Comment and Response Document of the Scoping Report.

Meetings held during the EIA Phase:

*1. The Royal Bafokeng*

The Royal Bafokeng expressed serious concerns about the proposed lines through their area as they were already affected by several lines that supply electricity to the mines around Rustenburg. The selected routes are as a result of several meetings held with the Planning Department of the Royal Bafokeng, Eskom and the consultants. This consultation has been extensive and continuous from scoping to the end of EIA when the final routes were selected. At a meeting held in July 2007 with the Royal Bafokeng they indicated that the final route alignment is acceptable to them as long as the line stays on the side where no mining development is to take place. The consultants have noted this.

*2. The Bakgatla ba Kgafela Traditional Council*

The Bakgatla Ba Kgafela TC was concerned that the route will affect the proposed Lebatlane Game Reserve that is driven by the North West Heritage Parks Board and Tourism. A meeting was held on 21 August 2007 with a few council members to discuss the route through the area. Please see **ANNEXURE III-20** for a copy of the minutes of the meeting. The council confirmed that they are aware of the project and will cooperate with Eskom negotiators in finding a suitable route. Please also refer to Section 5.1.4 dealing with the issue of the Heritage Park.

*3. Baphalane Traditional Council*

The traditional council together with Kgosi Ramokoka was met on 21 August 2007 to present the recommended route through the area and to introduce the Eskom negotiator. Please see **ANNEXURE III-21** for a copy of the minutes of the meeting.

*4. Bakwena Ba Mogopa Traditional Council*

The Bakwena ba Mogopa TC was met on 28 August 2007 with the purpose of confirming the farms that are affected by the lines in their area and to introduce the negotiator to them. Members of the council at the meeting were not certain about the farms that are owned by the Bakwena ba Mogopa and it was suggested that the administrative office in Bethanie be contacted. The council is not opposed to the project but requested that proper consultation for compensation and relocation be followed.

The contact person that can help with the farm list is Mr. Themba Mamogale (082 766 2121). Mr. Mamogale has been contacted and he indicated that his office will give the list of farms that will be affected but would like to see the map first.

*5. Bagkatla ba Makau*

It was established during the scoping phase that the Bagkatla ba Makua area is not affected by the proposed lines to Dinaledi SS. The study team decided to hold a meeting (28 August 2007) with the council to ascertain if the minor deviations made on the lines presented during the Scoping Phase is still not affecting the council's area. The map as presented showed that the area under the Bagkatla ba Makau is not affected.

#### **5.1.4 Heritage Park**

It was brought to the consultant's attention that the North West Parks Board and Tourism are planning a Heritage Park Development that has the ultimate aim of linking the Pilanesberg National Park and Madikwe Game Reserve.

A first meeting was held in September 2006 with representatives of the North West Parks Board and the Heritage Park Development to find out what the project was about and how it will possibly be impacted on by the proposed power lines.



The Heritage Park will also be affected by the proposed Delta-Epsilon project which entails 6 x 765kV transmission power lines from Lephalale to Potchefstroom. As this project will have a significant impact on the Heritage Park Development, subsequent meetings have taken place with the representatives from North West Parks Board and the Heritage Park. These meetings have focussed more on the Delta-Epsilon project and finding routes through the Heritage area. Please see **ANNEXURE III-23** for copies of the minutes of the meetings.

Members and representatives of the Heritage Park and North West Parks Board also attended the Public Open Day held in Rustenburg on the 14<sup>th</sup> of March 2007. Please see **ANNEXURE III-22** for a copy of the notes on the Open Day.

With the release of the EIR for public review which indicated various options in the area around the Heritage Park, it was brought to the consultant's attention that no specific mention was made in the EIR with regards to the Heritage Park. One of the options that was in the EIR was running along the boundary of the Heritage Park, which would according to allegations create a significant visual impact.

A meeting was then arranged with Willie Boonzaaier, the consultant of the North West Parks Board to discuss the different options around the Heritage Park. This meeting was held on the 14<sup>th</sup> of August 2007. Additional information was also received from the Heritage Park showing their proposed developments. Please see **ANNEXURE III-24** for a copy of this information.

From the meeting held on the 14<sup>th</sup> of August it was indicated that if the lines could go as far east as possible from the Heritage Park, that this would be acceptable to them. There is a possibility to shift the lines further east and this has been investigated.

#### **5.1.5 Mines**

There are a number of mining groups that have mining operations, especially from Spitskop down south to the Marang substation (Rustenburg). Many of these mines mine on property that belongs to the Royal Bafokeng Nation. Meetings were arranged with specifically the Royal Bafokeng – please refer to the section regarding consultation with traditional authorities, and with Rustenburg Platinum Mines.

The consultants and Eskom representatives met with the mine managers at the mines near Rustenburg and Northam to discuss the route options in these areas. Representatives from RPM and Kopano Joint Venture also attended the Public Open Day in Rustenburg on the 14<sup>th</sup> of March 2007 to indicate to the consultants their future planning. This has been taken into consideration in determining the final route.

#### **5.1.6 Other Landowners Groups and Lawyer Representation**

Various landowners in the study area have formed groups, such as the Steenbokpan Omgewingsforum, the Makoppa Environmental Action Group and the Thabazimbi EcoForum. They have all appointed legal representatives.

The Steenbokpan Omgewingsforum lies in the northern section of the study area and further north. They are more involved with the Mmamabula-Delta and Medupi-Delta projects, which entail the proposed Delta substation, and lines from Medupi to Delta and lines from Mmamabula to Delta. They have not really been involved with this project.

The Makoppa Environmental Action Group is located in the Makoppa area, west of Thabazimbi. They have been very actively involved with this project and have shown a willingness to work together to find the best solution for the entire area. Various meetings have been held with them to date.

The Thabazimbi EcoForum lies in the Thabazimbi area. They were very involved with the project and submitted a document detailing why the lines need to be placed further away from Thabazimbi. This document was submitted as part of the Scoping Phase for this project. They have not been involved anymore as the lines having, after specialists' investigation, moved further west, away from Thabazimbi.

Various individual landowners have also appointed legal council to represent them with this project. All letters received from lawyers and landowners alike are contained in the Comment & Response Document with copies of all letters attached.

#### **5.1.7 Requests from Government Departments**

##### *Department of Land Affairs*

A database was sent to the Department of Land Affairs in Limpopo and North West to assist the consultants in determining which farms have land claims on them. No information has been received to date from these departments. The consultants are aware that a number of properties, particularly those in the North West Department have land claims lodged against them.

##### *Department of Agriculture*

A database was sent to the Department of Agriculture in Limpopo and North West to assist the consultants in contacting emerging black farmers. No information has been received from these departments. There are some emerging black farmers that have been identified along the route. Most of these farmers seem to be subsistent farmers who have cattle and crop farming and are often part of the Traditional Authority in that particular area. Most of the issues relating to these farmers are related to grazing space for their cattle and if crop farming can still continue under the power lines.

#### **5.1.8 Extension of Comment Period**

Through consultation with affected landowners during the EIR phase of this project, key issues were identified that necessitated answers from Eskom. Landowners affected by the 400kV project are very likely to be affected by the proposed Delta-Epsilon project. They requested that in order for them to give comment on this project, they would need to know whether they will be affected by the proposed Delta-Epsilon project. As the Delta-Epsilon project has different timeframes than this project, and no Scoping Report has yet been released to the public for review, Eskom has given an undertaking to these affected landowners that they will not receive any 765kV lines on their properties, with certain conditions attached thereto.

Another issue that has been raised since the start of this project, and that has been heard at all meetings, is the issue regarding servitude clearance during construction and maintenance of the servitude area once the lines have been constructed. The maintenance issue also applies to existing lines. The landowners requested that they be offered the first opportunity to do the servitude clearing, as well as the maintenance of the existing and new power lines. Eskom has also agreed to this with, conditions. Please see **ANNEXURE III-25** for a copy of the letter from Eskom in this regard and the letter sent by the consultants to all I&APs.

A letter was sent to all registered I&APs on the database addressing these two issues and also affording I&APs with an additional review period due to the letter being sent at the end of the first review period. The review period was extended from the **24<sup>th</sup> of August 2007 to the 10<sup>th</sup> of September 2007**.

#### **5.2 Overview of Further Issues Raised by the Public**

A register with Comments & Responses has been drawn up which includes comments from meetings from stakeholders. Below follows a list of some of the key issues raised by stakeholders.

Key issues raised by stakeholders:

- Impact of 765kV and 400kV lines on properties and the area in total;
- Heritage Park and impact of power lines on development;
- Maintenance of existing and new power lines;
- Negotiation process, servitude payments, etc;
- Non payment of previous servitudes.

### 5.3 Latest Comments and Response Summary

Please see **ANNEXURE III-1** for the complete Comment & Response Document, containing all issues received from the onset of this project. This is a lengthy document as this project has had very high levels of public participation. Please also see **ANNEXURE III – 25** and **ANNEXURE III – 26** for a summary of letters received and responses from Eskom and the consultants on these letters. Copies of the entire letter are included as attachments for review.

### 5.4 Public Review of the EIR

The Environmental Impact Report (EIR) was made available for public review from Thursday 21 June 2007 to Friday 24 August 2007. The reason for the additional time for comment is due to the school holidays which run from 22 June to 16 July. The document was released for public review before the school holidays to ensure that all registered I&APs received the Executive Summary of the EIR on time.

### 5.5 Concluding Remarks

A list of all farms that will be affected by the proposed final route alignment shows that more than 90% of all directly affected landowners have been consulted with. Furthermore, all municipalities within the study area have been consulted with – during the Scoping Phase as well as during the EIA Phase. Extensive consultation has also taken place with all Traditional Authorities within the study area. Please see **ANNEXURE III-3** for a complete copy of the I&AP Database and **ANNEXURE III-2** for a list of all farms within the final proposed route alignment. Please also see **ANNEXURE IV-5** showing the level of Stakeholder Consultation with directly affected landowners.

All comments received have been collated into the Comment & Response Document.

## 6. ENVIRONMENTAL IMPACT ASSESSMENT & PROPOSED MITIGATION

Initially Eskom Transmission provided the environmental assessment practitioner (EAP) with a number of route options that would suit Eskom Transmission's needs best from a technical point of view. Eskom Transmission already considered a number of environmental and design aspects and constraints in determining these possible routes. Considerations such as power line distance, topography and physical spatial constraints have been considered.

The EAP had determined a study area for the purposes of the scoping phase of which the boundary was determined based on the most extreme boundary area within which the power line routes as proposed by Eskom Transmission could be placed.

The EAP further appointed a number of specialists to conduct studies mainly focussed on rating the potential routes as indicated by Eskom in order of preference and based on the specific findings of each individual specialist study. This information was used mainly as a guidance to focus efforts towards a final route option with at the most, one alternative, thus resulting in one or two most preferred routes for each power line.

For the purposes of presenting the study area and possible corridors to the public, each of the route options were indicated on a map as 5km wide route corridor options. Various maps were viewed by the public but the intention was always that there should be an understanding that the routes could in theory be placed anywhere within the study area.

The EAP also utilised the information obtained from the specialist reports and other available sources obtained during the PPP to identify areas of sensitivity and accessibility in a spatial format by utilising an Impact Evaluation & Matrix System (IE&MS) that was further utilised in a Geographical Information System Assessment Approach (GISAA).

In this part of the document the impact of each Project Activity Aspect (PAA) or *the Effect-causing Aspect* on each of the Environmental Aspects (EA) pertaining to the EIA study corridors as identified at the end of the scoping phase and which was initially determined for the entire scoping study area is further refined and assessed. Mitigation measures are proposed and the expected post-mitigation status is also indicated. Studies have focussed on those issues identified during the scoping phase as being significant and are indicated accordingly in this report.

### 6.1. ASSESSMENT METHODOLOGY:

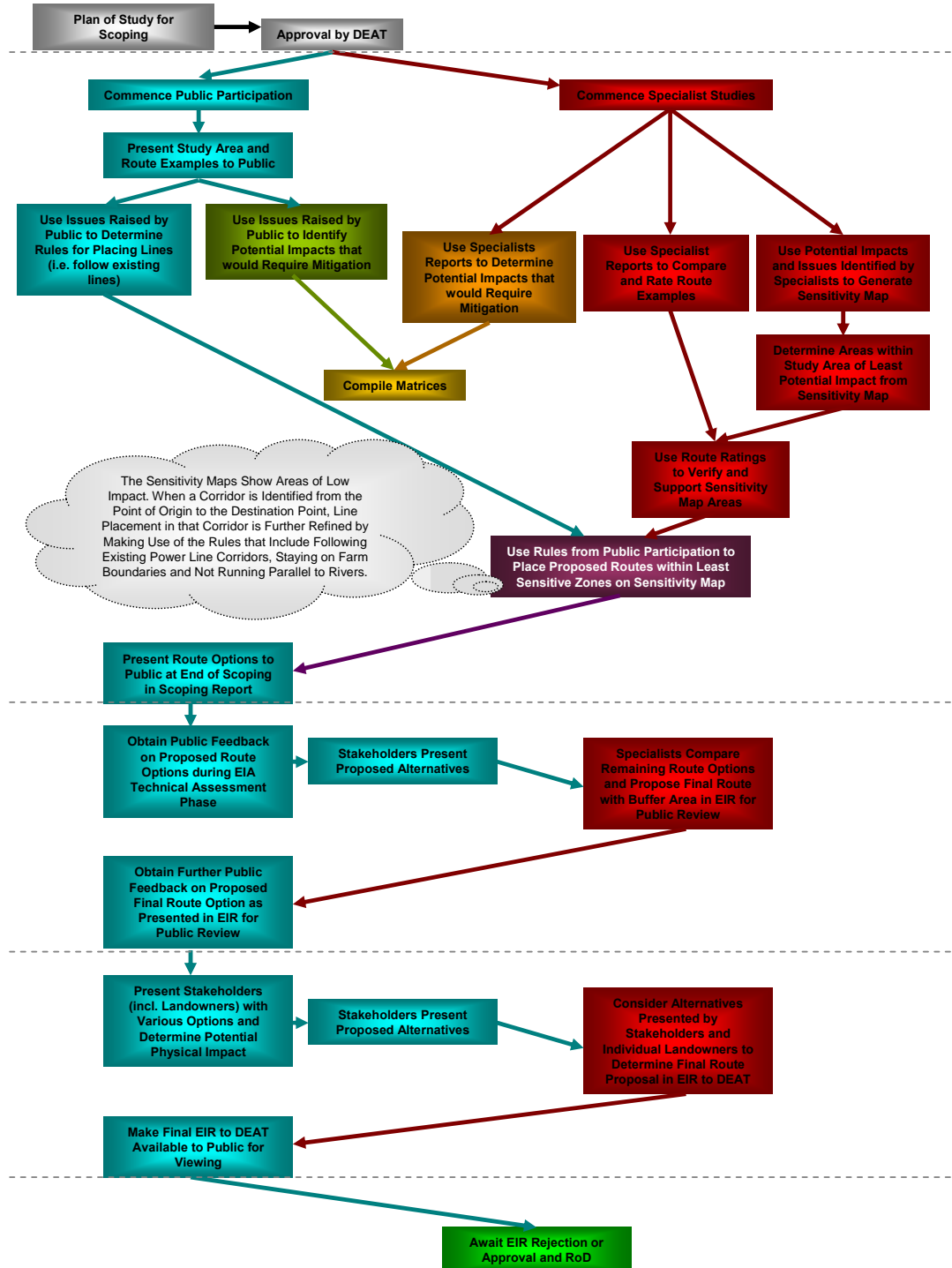
The following assessment approach has been utilised:

- Focussed specialist studies for known environmental aspects of significance as identified during scoping indicating areas within the study corridors where transmission power line placements would not be preferred.
- Further public and stakeholder participation from which additional issues and concerns are identified and utilised.
- Rating/evaluation of study corridor sections where more than one alternative exists to help determine where the most preferred routes/corridors could be expected to run.
- Impact evaluation on impact sheets focussing on and considering all relevant environmental aspects in terms of project activity aspects which is represented on matrices for the construction and operational phases of the proposed project. (IE&MS).
- Comparison of pre-mitigation and post-mitigation impact scenarios.
- Comparative assessment of any alternatives as applicable.
- Proposed mitigation measures based on expected potential impacts.

Please see **ANNEXURE I-1** for a complete description of the assessment methodology used in this assessment.

The following table summarises the steps that occurred during the entire EIA process with regards to the power line route assessment, comparison and decision-making.

Figure 6.1. – Power Line Route Assessment Process.



## 6.2. AESTHETIC ASPECT

### Impact & Mitigation:

Due to the linear nature of the project, a number of potential conflict areas in terms of potential visual impact had been identified. These potential conflict areas have been rated in terms of intensity of visual impact and the significance of each impact. Concluding from the rating and assessment of each area, it has been assessed that the construction of the 400kV line from Matimba B (Medupi) to Marang substation would have a **moderate negative** impact on the surrounding landscape. It is however imperative that the specific potential conflict areas be considered and the mitigation measures successfully implemented.

**Figure 9** in the specialist visual assessment (**ANNEXURE II-1**) indicates the preferred corridors, eliminating those options that feature too many potential conflict areas or landscapes with a high landscape sensitivity/visual resource value.

The following general mitigation measures should be followed for the entire project:

- The proposed corridor should not be allowed to traverse the crest of a hill. All lines should be located at the base of a hill and continued along the valleys encompassed by hills.
- Where possible, the proposed corridor should continue adjacent to an existing corridor.
- The mixing of pylon-types should be avoided to reduce visual conglomeration and create the illusion of visual harmony.

Post mitigation significance has not been determined as part of this study.

Table 6.2.

Description of Impact (ANNEXURE II-1)	Pre-mitigation Significance	Proposed Mitigation	Post-mitigation Significance
AREA 1: - The power transmission line will cause a moderate change in landscape characteristics over an extensive area resulting in a moderate change to key views. Operational activities will add to the cumulative negative effect on the visual quality of the landscape.	Medium	Ensure that the proposed corridor runs adjacent to the existing lines.	No Indication
AREA 2A: - The power transmission line will cause a moderate change in landscape characteristics over an extensive area resulting in a moderate change to key views. Operational activities will add to the cumulative negative effect on the visual quality of the landscape.	Medium	The crest of the Mmumbana hill should be avoided. The corridor should be positioned at the base of the hill, preferably to the west of it to screen some views from the nearby settlement.	No Indication
AREA 2B: -The power transmission lines will cause a notable change in landscape characteristics over an extensive area (alternative 1A) and/or intensive change over a localized area resulting in major changes in key views.	Medium	Avoid the crest of the ridge. It is recommended that this option be avoided due to the sensitive nature of the visual environment.	No Indication
AREA 4: - The power transmission line will cause a moderate change in landscape characteristics over localized area resulting in a minor change to a few key views. Operational activities will add to the cumulative negative effect on the visual quality of the landscape.	Medium	Ensure that the proposed corridor runs adjacent to the existing lines.	No Indication

### Alignment Implications:

Please see **ANNEXURE II-1** for the relevant visual assessment report. In the northern part of the study corridor where no options have been indicated at the end of scoping as no need for alternatives where identified, a few zones of significant visual sensitivity is indicated. These zones are however too large for any sensible re-alignment of the proposed transmission power lines and therefore the impact in this regard will have to be addressed by means of the proposed mitigation measures.

Towards the Spitskop substation a number of study corridor alternatives were determined during scoping. In terms of the visual assessment, the western-most option would have the least impact whereas both of the remaining options would have higher visual impacts. From a visual point of view, this western option is most preferred. South of the Spitskop substation and nearer the Marang substation there is a preference for the eastern-most option based on the visual assessment.

### 6.3. ECOLOGICAL ASPECT

The impacts on the ecology was assessed by means of two specialist assessments namely an avifauna study and a strategic ecology study. Please see **ANNEXURE II-4** for the avifauna report and **ANNEXURE II-5** for the ecology report.

From the avifaunal report, the following:

#### Impact & Mitigation:

Generic measures are indicated for the purpose of this aspect which will affect the post-mitigation situation.

Table 6.3.1.

Description of Impact	Pre-mitigation Significance	Proposed Mitigation	Post-mitigation Significance
Black Stork Collision with earth wire during operation. (Dams and river crossings, particularly the Matlabas and Crocodile Rivers)	Medium	See generic measures indicated in specialist report ( <b>ANNEXURE II-4</b> )	Low
Tawny Eagle Collision with earth wire during operation. Disturbance during construction (Near nests in commercial farming area)	Medium		Low
Martial Eagle Collision with earth wire during operation. Disturbance during construction (Near nests in commercial farming area)	Medium		Medium
Lanner Falcon	No impacts are foreseen		Low
Kori Bustard Collision with earth wire during operation (In open, flat areas mostly in the grassland patches in the commercial farming areas.)	Medium		Low
White-backed Vulture Collision with earth wire during operation. Disturbance during construction (Near nests in commercial farming area)	Medium		Low
Cape Vulture Collision with earth wire during operation (Anywhere at a carcass.)	Low		Medium
Lappet-faced Vulture Collision with earth wire during operation (Anywhere at a carcass.)	Low		Low
Marabou Stork Collision with earth wire during operation (Dams and river crossings, particularly the Matlabas and Crocodile Rivers)	Medium		Low
Secretarybird Collision with earth wire (In open, flat areas particularly in grassland patches and old lands)	Medium		Low
Lesser Flamingo Collision with earth wire during operation	Medium		Low
African Marsh Harrier	No impacts are foreseen		Low
African Grass-owl	No impacts are foreseen		Low
Lesser Kestrel	No impacts are foreseen		Low
Blue Crane Collision with earth wire	Medium		Low
Bateleur	No impacts envisaged		Low

#### Alignment Implications:

Please see **ANNEXURE II-4** for the Marang power line specialist avifauna study. No alternative study corridor selection could be based on the outcomes of this report as most of the study area corridor options are similar. In the areas where sensitive zones such as rivers are crossed, these sensitive zones are existing linear zones that cannot be missed by means of any reasonable re-alignment and therefore can only be addressed by means of other mitigation measures as described in the specialist report.

From the ecology report, the following:

Impact & Mitigation:

Respective results of the floristic and faunal sensitivity analysis are combined to present an overview of the ecological sensitivity of the study area. Habitat encountered along the proposed route is divided into the following categories:

- ☞ Natural habitat (regional habitat types, of which there are numerous varieties);
- ☞ Transformed habitat [the extent of this habitat type is indicated in the scoping report, Section 7.10 (page 17), Figure 9 (page 23)];
- ☞ Protected habitat (wetlands, RAMSAR Convention); and
- ☞ Sensitive habitat (Ridge habitat).

In order to present the reader with an indication of the ecological sensitivity of the respective sensitive habitat types, the highest sensitivity for each ecological unit is selected as being representative of the ecological sensitivity of the specific ecological unit. Combined results from the floristic and faunal sensitivity analysis indicate the high sensitivity of wetland regimes and ridge habitat types. The status of these areas is fairly pristine and are therefore considered suitable habitat for a variety of Red Data flora and fauna species. The largest extent of the study area exhibit medium sensitivity ecological attributes and the proposed activity is not expected to result in significant impacts in these areas.

Table 6.3.2.

Description of Impact	Pre-mitigation Significance	Proposed Mitigation	Post-mitigation Significance
<u>Ridges Habitat:</u> Destruction of threatened species & habitat	High	Realignment of lines to avoid ridges Limited maintenance activities, no severe impact on habitat Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey Remove threatened and protected plant species	Low
<u>Riparian Habitat:</u> Destruction of threatened species & habitat	High	Avoid surface impacts on riparian systems - 30m buffer zones Generic mitigation measures Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey Remove threatened and protected plant species	Low
<u>Regional Habitat:</u> Destruction of threatened species & habitat	High	Implementation of bio- monitoring programmes Adaptive management & conservation Implementation of rehabilitation, monitoring & control Programmes Final recommendations during walk-through survey Remove threatened and protected plant species	Medium
<u>Substation Upgrade Sites:</u> Destruction of threatened species & habitat	Low	Implementation of bio- monitoring programmes Generic mitigation measures Rehabilitation, monitoring & control Programmes Final recommendations during walk-through survey Remove threatened and protected plant species	Low
<u>Ridges Habitat:</u> Destruction of sensitive habitat & areas of high biodiversity	High	Realignment of lines to avoid ridges Limited maintenance activities, no severe impact on habitat Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Medium
<u>Riparian Habitat:</u> Destruction of sensitive habitat & areas of high biodiversity	High	Avoid surface impacts on riparian systems - 30m buffer zones Generic mitigation measures Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Regional Habitat:</u> Destruction of sensitive habitat & areas of high biodiversity	Medium	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Substation Upgrade Sites:</u> Destruction of sensitive habitat & areas of high biodiversity	Low	Implementation of bio- monitoring programmes Generic mitigation measures Rehabilitation, monitoring & control programmes	Low
<u>Ridges Habitat:</u> Destruction of pristine habitat types	High	Realignment of lines to avoid ridges Limited maintenance activities, no severe impact on habitat Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Riparian Habitat:</u> Destruction of pristine habitat types	High	Avoid surface impacts on riparian systems - 30m buffer zones Generic mitigation measures Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Regional Habitat:</u> Destruction of pristine habitat types	Medium	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Substation Upgrade Sites:</u> Destruction of pristine habitat types	Low	Implementation of bio- monitoring programmes Generic mitigation measures Rehabilitation, monitoring & control programmes	Low
<u>Ridges Habitat:</u>	High	Realignment of lines to avoid ridges Limited maintenance activities, no severe impact on habitat	Low



Description of Impact	Pre-mitigation Significance	Proposed Mitigation	Post-mitigation Significance
Changes to habitat diversity & biodiversity		Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	
<u>Riparian Habitat:</u> Changes to habitat diversity & biodiversity	High	Avoid surface impacts on riparian systems - 30m buffer zones Generic mitigation measures Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Regional Habitat:</u> Changes to habitat diversity & biodiversity	High	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Medium
<u>Substation Upgrade Sites:</u> Changes to habitat diversity & biodiversity	Low	Implementation of bio- monitoring programmes Generic mitigation measures Rehabilitation, monitoring & control programmes	Low
<u>Ridges Habitat:</u> Impacts on surrounding natural habitat and species	Medium	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Rehabilitation and control programmes	Low
<u>Riparian Habitat:</u> Impacts on surrounding natural habitat and species	Medium	Avoid surface impacts on riparian systems - 30m buffer zones Generic mitigation measures Implementation of rehabilitation, monitoring & control programmes Final recommendations during walk-through survey	Low
<u>Regional Habitat:</u> Impacts on surrounding natural habitat and species	Medium	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Rehabilitation and control programmes	Low
<u>Substation Upgrade Sites:</u> Impacts on surrounding natural habitat and species	Medium	Implementation of bio- monitoring programmes Adaptive management & conservation strategies Rehabilitation and control programmes	Low

Alignment Implications:

Please see **ANNEXURE II-5** for the Marang power line specialist ecology study with specific reference to **Figure 8** in the same report. The specialist in this regard numbered the various deviations of the study corridor from running along the existing lines in the north near the Matimba B (Medupi) power station towards the Spitskop substation from 1 to 4 with 1 being the first or eastern-most deviation and 4 the western-most or last deviation. South of Spitskop the specialist numbered the eastern option 5 and the western option 6.

A recommendation of route variants between variants 1 to 4, 5 and 6 is made on the basis of ecological sensitivity, expected impact and mitigation potential of likely impacts.

Of line variants 1, 2, 3 or 4, the use of variant 2 or 3 is recommended. Although it will pass in close proximity to sensitive natural features, the number of ridges that will be crossed is less and slight realignment is likely to limit potential impacts to a minimum. It is emphasized that the expected impacts arising from the use of variants 1 or 2 will be only slightly less, while variant 4 is considered least preferable.

The specialist indicated a preference for variant 5 rather than 6. Likely impacts arising from both these options are considered similar and could be mitigated effectively.

#### 6.4. CULTURAL AND HERITAGE ASPECTS

The impacts on the cultural and heritage aspects were assessed by means of two specialist assessments namely a specialist heritage study and a specialist cultural landscape study. Please observe **ANNEXURE II-2** for the heritage report and **ANNEXURE II-3** for the cultural landscape study.

From the heritage report, the following:

Impact & Mitigation:

Post-mitigation significance has not been determined for this aspect but it is expected that the implementation of proposed mitigation measures will reduce the significance of all impacts that may occur. It is not expected that these resources will be affected, but potential sites are located near the proposed routes as described in the following.

Table 6.4.1.

Description of Impact	Pre-mitigation Significance	Proposed Mitigation	Post-mitigation Significance
<b>Northern Stretch</b>			
Matimba B – Matlabas River (Ruin, Geelhoutkloof 359)	Low	Mitigation measures specific to each area have not been proposed as these areas are not necessarily going to be affected. See the notes below.	Not Indicated.
Matlabas River – Crocodile River			
At least 5 ruins close to Crocodile River (one may be impacted)			
Crocodile River – Zoetdoorns 259	Low		Not Indicated.
Ruin on Geluk 212			
Zoetdoorns – Spitskop	High		Not Indicated.
Stone walled sites, base of Sefikele kopje	High		Not Indicated.
Graves, south-west of Spitskop	High		Not Indicated.
<b>Southern Stretch</b>			
<b>(Western/Eastern Matimba B- Dinaledi options)</b>			
Spitskop-east of Mogwase	High		Not Indicated.
Graves at junction between Eastern Matimba B-Dinaledi and southernmost stretch			
<b>Western Matimba B-Marang option</b>			
Thlating – Na Gape	High		Not Indicated.
Stone walled sites at Ga Nape			
Paardekraal – Marang	High		Not Indicated.
Stone walled sites close to kopjes near Marang			
<b>Eastern Matimba B-Marang option</b>			
Mogwase – Moordkop	High		Not Indicated.
Moordkop			
Moordkop – Makgope/Malepe	High		Not Indicated.
Stone walled sites along Makgope's eastern end			
Makgope/Malepe-southern turning point	High		Not Indicated.
Graveyard close to the power line			
Southern turning point – Marang	Medium-high		Not Indicated.
Stone walled sites along western edge of Thaba-ea-Nape mountains			
<b>Marang substation</b>			
Stone walled sites near substation	High		Not Indicated.

It is possible that ruins on Geelhoutskloof 359JQ and Geluk 212KP may be impacted by the new power line. The nature, extent and significance of these 'ruins' which have been identified from the 1: 500 000 topographical maps is unknown. These remains were mostly constructed with durable material such as brick and cement walls and usually do not have outstanding significance as they date from the more recent past. However, if these ruins are older than sixty years they do qualify as heritage resources and are protected by Section 34 of the National Heritage Resources Act (No 25 of 1999).

Stone walled sites are abundant in and near the Eskom Project Area. These sites date from the Late Iron Age. They are mostly associated with kopjes and mountains, where norite and dolerite were used in the construction of these sites. The sites are usually single settlements on kopjes or are clustered along the lower foot slopes and spurs of large mountains. The clusters of stone walled sites are composed of varying numbers of individual sites (*dikgôrô*) that were grouped together to form villages which covered large areas. The majority of the stone walled sites are confined to mountains and kopjes on the farms Nooitgedacht 282JQ, August Mokgatles, Welbekend 117JQ and Beestekraal 290JQ. The following settlement types can be distinguished:

- Tswana villages (singular *metse*, plural *metse*) which were composed of a single village (*kgôrô*) or a conglomeration of villages (*dikgôrô*). A typical *kgôrô* is characterized by an outer scalloped wall that encircles central kraal complexes that were usually linked together. The outer scalloped walls still contain the remains of dwellings (huts) within their surrounding yards (*malapa*) that were occupied by the various family groups (*masika*), central kraal complexes composed of courts (*makgotla*) and enclosures for domestic stock. Tswana sites are common throughout the Project Area.
- There are some sites that are composed of long terrace walls that are 'stepped' down the slopes of mountains. The terrace walls are associated with a few small and large enclosures. These sites are not demarcated with clear outer boundary walls. It is possible that these sites may have been built by Ndebele people.
- There were some sites with spatial compositions that could not be interpreted as yet, due to the dense vegetation cover on these sites at the time of the year when the study was done. However, it is expected that settlement types not previously recorded may occur in the clusters that were discovered in the Eskom Project Area.

The stone walled sites in and near the Eskom Project Area can be rated as significant in terms of criteria such as the following:

- The Thaba-ea-Nape range of mountains with individual mountains in this range such as Malejane, Nape, Mofothelo, Motlhabe, etc are historical beacons, as they are associated with human occupation during the last three hundred and fifty to four hundred years.
- These sites and clusters of sites represent different villages which were occupied simultaneously by several thousands of people who lived in these villages from pre-historical times (AD1650) well into the historical period. (Some of the sites may still have been occupied during the Transvaal Anglo War [1899-1902]).
- Many of the sites and clusters of sites with their surrounding landscape represent 'cultural landscapes or townscapes' which are unique, as these sites and complexes of sites reflects a regional history, in particular that of Kwena clans such as the Bafokeng.
- These townscapes incorporate intangible heritage attributes such as a sense of place, the majesty of mountains associated with the social (political) importance of rulers, activity areas which served as pastures for stock, wood and water collecting spots, possible places of sacrifice and worship, etc.
- These site complexes are unique in the context of the Late Iron Age, as they contain settlements that are characteristic of Tswana and mixed Tswana/Zulu (Ndebele) populations.
- Some of the settlements and clusters of settlements are in an excellent (pristine) condition and have not been affected by any development in the past. (However, its is also true that many sites and clusters of sites have been affected in one way or another by mining or other development activities in the past).
- These sites offer outstanding research opportunities, as they represent archaeological 'laboratories' which can be utilized for decades to come. Tangible heritage remains in the form of artefacts, structures and features are in abundance in the archaeological deposits that are associated with the sites.
- The village complexes offer exceptional educational and tourism potential, if they are developed according to correct scientific and museological principles.

Graves and graveyards hold high significance and are protected by various laws. Legislation with regard to graves includes the National Heritage Resources Act (No 25 of 1999) whenever graves are older than sixty years. The act also distinguishes various categories of graves and burial grounds. Other legislation with regard to graves includes those which apply when graves are exhumed and relocated, namely the Ordinance on Exhumations (No 12 of 1980) and the Human Tissues Act (No 65 of 1983 as amended).

The magnitude of the impact of the various stretches of the Matimba B-Marang power line and the Marang Substation on various heritage resources and graves has been indicated and is discussed below:

It is possible that ruins on Geelhoutskloof 359JQ and Geluk 212KP may be impacted by the new power line. The following stretches of the proposed Matimba B-Marang power line together with the Marang Substation may have a negative impact on single stone walled sites or clusters of stone walled sites, namely:

- The Western Matimba B-Marang option: The stretch runs from Paardekraal eastwards and then south-eastwards to the Marang Substation. Stone walled settlements occur at most of the isolated, scattered norite hills close to the Marang Substation.
- The 1<sup>st</sup> Eastern Matimba B-Marang option: The stretch runs between Makgope/Malepe Mountains and the southernmost point. The eastern end of Makgope Mountain is covered with stone walled sites which may be impacted by the power line.
- The 2<sup>nd</sup> Eastern Matimba B-Marang option: This stretch runs from the southern most turning point along the western edge of the Thaba-ea-Nape range of mountains to the Marang Substation. This stretch of the Thabaea – Nape mountain range is covered with a number of stone walled sites.
- The Marang Substation: Kopjes to the north and south of Marang Substation are associated with stone walled settlements. Upgrading of the Marang Substation may have an affect on these settlements.

It seems as if a graveyard along the Makgope/Malepe Mountains to the southern most point (1st Eastern Matimba B-Marang Option) may potentially be affected by the new power line.

Any required mitigation should be easily achieved by placing the pylons and access roads away from any identified sites.

Alignment Implications:

Please see **ANNEXURE II-2** for the Marang power line specialist heritage study. The most significant impact on stone walled sites and complexes of stone walled sites (cultural landscapes) may occur along the 2<sup>nd</sup> Eastern Matimba B-Marang option considering the large number of sites and complexes of sites which occur along this option. The Western Matimba B-Marang option therefore may be a preferred option if the 2<sup>nd</sup> Eastern Matimba B-Marang option's new trajectory along Eskom's existing power line may not guarantee the unaffected continued existence of stone walled sites and cultural landscapes along this option.

Although no sites are known to exist along any of the proposed routes, this can only be confirmed by means of a walk-through during the design stage of the project.

From the cultural landscapes report, the following:

Please see **ANNEXURE II-3** for the Marang power line specialist cultural landscapes study. The report effectively indicates that there are essentially no cultural landscapes that would be affected by any of the proposed power line routes and that there would be no preference between the route options from this point of view.

**6.5. SOCIAL AND SOCIO-ECONOMIC ASPECTS**

Please see **ANNEXURE II-6A** for the Marang power line specialist social study. Also see **ANNEXURE II-6B** for a further study conducted near the proposed Pilanesberg-Madikwe Heritage Park to help determine a route in this area.

Impact & Mitigation:

**Table 6.5.1. Summary of Impacts per Phase**

CHANGE PROCESS	CHANGE PROCESS	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
<b>PRE CONSTRUCTION AND CONSTRUCTION</b>			
<b>ECONOMIC</b>	Direct formal job opportunities for local individuals and/or contractors	Medium +	High +
	Indirect formal and/or informal job opportunities for local individuals and/or contractors – if accommodated in the communities	Medium +	High +
	Compensation for servitude	Low +	High +
	Visibility of construction activities that could lead to indirect economic change	High -	Medium -
<b>LAND USE</b>	Temporary loss of cultivated land due to construction activities	Medium -	Low -
	Temporary loss of grazing land due to construction activities - cattle	Medium -	Low -
	Temporary loss of grazing land due to construction activities – game	High -	Medium -
	Mining	High -	Low -
	Impact of construction activities on movement patterns of local community	Medium -	Low -
<b>DEMOGRAPHIC</b>	Relocation as a result of servitude negotiation	High-	Depends on individual/families
	Influx of construction workers on size and composition of local community	Medium -	Medium +
	Influx of job seekers on size and composition of local community	Medium -	Low -
	Outflow of locally employed labourers to move with the construction team	Medium - and medium +	Medium +
<b>EMPOWERMENT AND INSTITUTIONAL</b>	<i>The negotiation process</i>	Low - to High +	Low + to Medium+
	<i>Control – feels lack of control because of presence of construction and maintenance workers.</i>	Medium -	Low + or Medium +
<b>ENVIRONMENTAL</b>	Pollution and fire risk on construction workers and local community, economic	Medium - to High -	Low -
<b>SOCIO-CULTURAL</b>	Integration with local community, including risk of spreading STI and HIV/AIDS	Very high -	High -
	Construction related noise	Medium -	Low -

CHANGE PROCESS	CHANGE PROCESS	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
<b>OPERATION</b>			
<b>ECONOMIC</b>	<i>Direct formal job opportunities for local individuals and/or contractors</i>	Low +	Medium +
	<i>Indirect formal and/or informal job opportunities for local individuals and/or contractors</i>	Low +	Medium +
	Visibility of Transmission power line that could lead to indirect economic change	High -	Medium -
	Increase in electricity	High +	High +
<b>LAND USE</b>	Permanent loss of cultivated land due to presence of pylons on the land	Medium -	Low -
	Permanent loss of grazing land due to presence of pylons on the land	Medium -	Low -
	Impact of Transmission power lines on mining activities	High -	Medium -
	Impact of Transmission power lines on game	High -	Medium -
	Impact of Transmission power lines on spatial development	Medium -	Low -
	Impact of Transmission power lines on movement patterns of local community	Low -	Low /
<b>SOCIO-CULTURAL</b>	Integration of maintenance workers with local community, including risk of spreading STI and HIV/AIDS	High -	Medium -
	Presence of Transmission power lines on physical well-being	Low -	Low -
	Presence of Transmission power lines on mental well-being	High -	Medium -

**Table 6.5.2. Summary of Impacts per Change Process**

PHASE	IMPACT	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
<b>ECONOMIC CHANGE PROCESS</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION</b>	<i>Direct formal job opportunities for local individuals and/or contractors</i>	Medium +	High +
	<i>Indirect formal and/or informal job opportunities for local individuals and/or contractors</i>	Medium +	High +
	<i>Compensation for servitude</i>	Low +	High +
	Visibility of construction activities that could lead to indirect economic change	High -	Medium -
<b>OPERATION</b>	<i>Direct formal job opportunities for local individuals and/or contractors</i>	Low +	Medium +
	<i>Indirect formal and/or informal job opportunities for local individuals and/or contractors</i>	Low +	Medium +
	Visibility of Transmission power line that could lead to indirect economic change	High -	Medium -
<b>LAND USE CHANGE PROCESS</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION</b>	Temporary loss of cultivated land due to construction activities	Medium -	Low -
	Temporary loss of grazing land due to construction activities - cattle	Medium -	Low -
	Temporary loss of grazing land due to construction activities – game	High -	Medium -
	Mining	High -	Low -
	Impact of construction activities on movement patterns of local community	Medium -	Low -
<b>OPERATION</b>	Permanent loss of cultivated land due to presence of pylons on the land	Medium -	Low -
	Permanent loss of grazing land due to presence of pylons on the land	Medium -	Low -
	Impact of Transmission power lines on mining activities	High -	Medium -
	Impact of Transmission power lines on game	High -	Medium -
	Impact of Transmission power lines on spatial development	Medium -	Low -
	Impact of Transmission power lines on movement patterns of local community	Low -	Low /
<b>DEMOGRAPHIC CHANGE PROCESS</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION</b>	Relocation as a result of servitude negotiation	High-	Depends on individual/families
	Influx of construction workers on size and composition of local community	Medium -	Medium +
	Influx of job seekers on size and composition of local community	Medium -	Low -

PHASE	IMPACT	SIGNIFICANCE (pre-mitigation)	SIGNIFICANCE (post-mitigation)
	Outflow of locally employed labourers to move with the construction team	Medium – and +	Medium +
<b>ENVIRONMENTAL CHANGE PROCESS</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION</b>	Pollution and fire risk on construction workers and local community	Medium to high -	Low -
<b>SOCIO-CULTURAL</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION</b>	Integration with local community, including risk of spreading STI and HIV/AIDS	Very high -	High -
	Construction related noise	Medium -	Low -
<b>OPERATIONAL</b>	Integration of maintenance workers with local community, including risk of spreading STI and HIV/AIDS	High -	Medium -
	Presence of Transmission power lines on physical wellbeing of local community	Low -	Low -
	Presence of Transmission power lines on mental wellbeing of local community	High -	Medium
<b>EMPOWERMENT AND INSTITUTIONAL CHANGE PROCESS</b>			
<b>PRE-CONSTRUCTION AND CONSTRUCTION AND OPERATION</b>	<i>The negotiation process</i>	<i>Low - to High +</i>	<i>Low + to Medium+</i>
	<i>Control – feels lack of control because of presence of construction and maintenance workers.</i>	<i>Medium -</i>	<i>Low + or Medium +</i>

The following Mitigation Measures are proposed by the specialist:

An extensive list of mitigation measures is given in the specialist report and is not repeated here. Most are centred on effective management of both the negotiation and construction processes. In the negotiation process it is critical that Eskom assists the landowners with fair valuations and takes careful note of the landowners' requirements for the location of the line and any construction and maintenance requirements. The negotiator also needs to ensure these requirements are captured in the EMP before construction starts.

Before the construction process it is seen to be vital that Eskom engages with the local communities along the line and establishes effective lines of communication for the construction phase. This will assist in the minimisation of many of the potential social impacts identified with the new line, including job creation, social disruption and spreading of diseases. The reader is therefore referred to the specialist report in **ANNEXURE II-6A** for the recommended mitigation measures.

**Alignment Implications:**

Please see **ANNEXURE II-6A** for the Marang power line specialist social study.

In the specialist study the study corridors are divided into sections that have been considered. The study indicates a number of problem areas that require special attention but as far as preferred transmission power line placement is concerned, the following is applicable:

- From Matimba B (Medupi) power station the power lines should be placed east of the existing power lines running towards Spitskop and should follow the eastern-most option towards Spitskop substation.
- From Spitskop substation the western-most route is again proposed along the eastern side of the existing power line before turning west as far south as possible.
- At Marang substation it is proposed that the eastern-most option is followed for entry to the substation.

**6.6. PRE-MITIGATION IMPACT SCENARIO**

Please observe **ANNEXURE IV-1A&B** for the pre-mitigation impact matrix as determined during the scoping phase. Note that these matrices indicate impacts for all potential impacts of the proposed power lines and are not based on site specific conditions as such but on worst scenario conditions that could be expected within any area along the proposed power line route.

Please see **ANNEXURE I-1** for a complete description of the assessment methodology used in during scoping which also explains the matrices. Note however that due to the extensive assessment conducted during scoping, these matrices have not changes and therefore it is proposed that the reader consider the scoping report findings. The matrices are included merely to remind the reader of the findings during the scoping phase and to show that they remain the same.

#### 6.7. POST-MITIGATION IMPACT SCENARIO

Please observe **ANNEXURE IV-2A&B** for the post-mitigation impact matrix. Mitigation as proposed by the various specialists have been taken into consideration and these matrices indicate the post-implementation scenario expected if all mitigation measures as proposed by the specialists are implemented successfully.

#### 6.8. IDENTIFIED PREFERRED ROUTES & CORRIDORS

##### 6.8.1. Alternative Routes Comparison and Final Placement: Matimba B (Medupi)-Marang

The scoping phase resulted in the selection of a route with some alternatives that showed the least possible total environmental impact within the study area based on both the total environmental impact sensitivity map and the most significant issues raised by the general public and more specifically affected landowners. The route alignments with a 5km width of study corridor were established for further study during the technical EIA. See **ANNEXURE IV-3** for the applicable map indicating the study corridors and original scoping study area.

During the technical EIA phase these corridors where further studied in terms of those issues raised during scoping that seemed to require further assessment. Most of the studies with the exception of the social impact study and the visual impact study indicated no clear preference of the possible study corridor alternatives that was indicated and preferences in specific power line placements. The social impact assessment especially, makes some clear recommendations with regards to more exact line placements.

Based on the studies, a most preferred corridor was however determined, as follows:

1. From the **Visual Assessment** indicated in **Paragraph 6.2**. Towards the west and north of the Spitskop substation, the most preferred option is the western option. Mitigation measures are however possible for the other two alternatives. The eastern-most option is preferred towards the Marang substation.
2. From the **Ecological Assessment** indicated in **Paragraph 6.3**. The avifauna report indicates no route preferences due to the similarity between these areas and proposes that mitigation measures would be sufficient if implemented to minimise potential impacts. The biodiversity assessment indicated a preference for the central option with the western option least preferred. Towards Marang the eastern route is preferred. Again effective mitigation would be possible for all the options.
3. From the **Cultural and Heritage Assessment** indicated in **Paragraph 6.4**. The reports indicate no route preferences due to the lack of sites along any of the alternatives north of Spitskop. South of Spitskop a preference is made for the western route where fewer or no archaeological sites are expected. The eastern route would be acceptable if no sites were to be affected.
4. From the **Social and Socio-economic Assessment** indicated in **Paragraph 6.5**. This report prefers placement of the lines along the eastern-most route towards Spitskop substation as well as towards Marang. This report is the only report indicating a choice between the two options directly south from Spitskop and prefers the western option.



5. When considering the above specialist indications, it was clear that the socio-economic aspects weighed heavier, mainly as it would allow for the least possible mitigation measures. Since all three of the options towards Spitskop substation had a preference from a different specialist study, the socio-economic study's preference which is the eastern-most option was chosen.
6. South of Spitskop substation only the socio-economic report makes a reference for the western-most of the two options.
7. Near Marang substation the visual, ecological and socio-economic reports indicate a preference for the eastern-most option.

The results indicated above were more than one possible route option if the individual specialists' requirements were to be addressed. However by comparing the findings of the concluding specialist studies as indicated and assessing which options would cause the least combined impact, a most preferred option arose. This option had to be further tested through the public participation process and especially with regard to specific landowners as indicated further in this section.

Based on the above, the EAP designed a proposed alignment for the 400kV Marang power line indicated as route **M&D1** in the following **Table 6.8.1.** and depicted accordingly in the maps in **ANNEXURE IV-3.** These proposed alignments are for the servitude required for the proposed 400kV power line linking Matimba B (Medupi) power station with Marang substation.

The map initially indicated a 250m buffer on each side of the outer servitude for possible re-alignments after the issuing of the RoD and consequent negotiations with landowners for final servitude rights.

Please note that since the 2 X 400kV power lines to Dinaledi runs along the same corridor for most of the route; all maps indicate the Dinaledi lines as well. The placement of the Marang line could not be considered in isolation due to the use of a single electricity transmission utility corridor for as much as possible of the proposed route.

During the process of conducting the above-mentioned studies and assessments, an environmental action group from Makoppa requested that they be allowed to represent the community of Makoppa in proposing a route option that would most suit the community of Makoppa, most specifically the landowners.

The route option(s) proposed was included as additional route options to be considered by the EAP. See the following **Table 6.8.1.** and the accompanying **ANNEXURE IV-3** for an indication of where these alternative routes are located. In order to firstly test the viability of the presented option(s), the EAP approached Eskom for a technical analysis of cost and construction implications. This information provided a sufficient indication to the EAP as to whether the proposed option(s) would be viable. The findings were as follows:

1. The proposed alternative options mostly intended that the proposed transmission power lines should follow existing roads.
2. The alternatives consisted of several bends of more than 3° meaning that strain towers would be required more often.
3. The proximity of roads required that the lines would have to be placed away from the proposed roads further into adjacent landowners' land due to the minimum requirement that such infrastructure could not be built within 95m of the road centres unless a special relaxation was obtained from the road authority.
4. Self supporting strain towers would require up to 180% more steel than the normal pylons along a straight route and would therefore be significantly more visible.
5. Cross-rope pylons along a straight route could also be placed up to 500m apart along the route whilst strain towers would have to be placed closer together by as much as 150m separation distance.



6. Up to five times as much steel would have to be used in following the proposed alternative routes and this would entail a significant increase in resource utilisation as well as construction times which would in turn have additional negative environmental impacts and extend the construction time for the projects.
7. The proposed option would not be able to follow existing power line routes in a corridor and would affect virgin areas in this regard.
8. The EAP cannot support this approach due to the increase in overall environmental impact significance where a more sensible option is available in the form of straighter lines that follow a corridor of already disturbed land by the same activity.

During the public review of the EIR, a number of more site-specific issues arose which the EAP had to take into account before proposing a final route. When visiting individual landowners on their land and by travelling along the initially proposed routes, several site specific problems could also be identified.

The **first problem** was identified when visiting the Rustenburg Platinum Mines' Zwartklip Operation and realising that the mine had developed along a north-south stretching ridge with numerous existing pits and tailings established and planned for the future that would make it impossible to place the proposed power lines through this area. Consequently a route around the mine had to be found. This is the route indicated as **ZKA1** in **Table 6.8.1.** and the accompanying **ANNEXURE IV-3** and is part of the initially proposed **M&D1** route.

The **second problem** came to light when consulting with and visiting the landowners along the **L15** route option section as indicated on **ANNEXURE IV-3** of who most have farms that also boundary on the alternative **L16, L20, L21** and **L25** options which is part of the **BE1** option as indicated in **Table 6.8.1.** and the accompanying **ANNEXURE IV-3.** Most of these landowners indicated that they would strongly oppose the **L15** route option and that it would have significant impacts on their specific activities.

These landowners, with the exception of one or two, proposed the use of the option running along the western side of their farms indicated as **BE1** in the mentioned table which they would rather support with conditions. In addition to the above, landowners towards the east of the **L15** route option indicate that their activities would be significantly affected and their businesses damaged to the same effect as those on the western side of the **L15** route option, should this option be followed whereas the tribal land owners west of the **BE1** route option that owns most of that land, indicated their willingness with conditions to allow the proposed line routes through that area.

In further support of the **BE1** option, the **L15** option would also have to run along an existing road, of which the implications have already been explained in terms of the MEAG's proposal earlier in this report, go through a narrow area of an east-west running ridge which is not preferable from the visual specialist's and the ecology specialist's points of view and cross over a number of homesteads that had been established along the road where the farm entrances are located.

The **third problem** arose when travelling along the initially proposed route towards Spitskop on the farm Nooitgedacht and entering into a significant wetland area the **L30** route section as indicated on **ANNEXURE IV-3.** In order not to place the lines through this problem area, a route from **CP16, CP17, CP18** or **CP19** to **CP23** would have to be found and it was initially thought that a new option indicated as **BZ1** and linking **CP16** with **CP23** via **L27** and **L34** as indicated in **Table 6.8.1.** and the accompanying **ANNEXURE IV-3** could be followed. This option would help alleviate some of the implications for Eskom having to follow a route around the Zwartklip mining operation that would entail significant bends and turns. But a further problem with this option awaited the EAP.

The **fourth problem** identified in this regard, was the identification of the Pilanesberg-Madikwe Heritage Park which affected a section of the proposed corridor west and northwest of the Spitskop substation indicated as **L23** on **ANNEXURE IV-3**. Representatives of the park indicated that this option as well as the alternative **L27** route option would seriously affect the park's success and even render the project non-viable. Both these options would, according to their assessment, destroy the option of establishing some of the main infrastructure required for the project's success near Tshweneng on the farm Vogelstruiskraal.

To address this problem, the EAP would have to exclude the **L27** route option, thus rendering the **BZ1** option non-viable. Alternatives **BZ2**, **BZ3** and **BZ4** as indicated in **Table 6.8.1.** and the accompanying **ANNEXURE IV-3** would therefore have to be considered. A significant north-south ridge runs through the area where the **L28** option is proposed and several settlements occur along its eastern slopes towards the town of Mmantserre and the Bierspruit.

The **L29** options would have to run through a mine in the northern area which is also a problem. Considering these findings, the **BZ4** option seems the most suitable option. The EAP decided to acquire a further assessment from the social specialist in this area as it is considered to be most sensitive from a social and socio-economic point of view. Please see **ANNEXURE II-6B** for the results of this report, showing a preference for the **BZ4**.

Towards the end of the EIR public review period a letter was also received from Mr. Duard Barnard indicating that he represents a number of landowners and organisations such as the MEAG and that an alternative route is proposed towards the east of the EAP's existing proposed options indicated as **L-DB** in **Table 6.8.1.** and the accompanying **ANNEXURE IV-3**.

The EAP carefully considered this alternative option but is not in a position to support this route for a number of reasons as follows:

1. The proposed alternative option mostly intended that the proposed transmission power lines should follow existing roads and railways.
2. The alternatives consisted of several bends of more than 3° meaning that strain towers would be required more often than for the straighter option.
3. The proximity of roads and railways required that the lines would have to be placed away from the proposed roads further into adjacent landowners' land due to the minimum requirement that such infrastructure could not be built within 95m of the road centres and due to numerous safety requirements pertaining to the railway lines.
4. Self supporting strain towers would require up to 180% more steel than the normal pylons along a straight route and would therefore be significantly more visible.
5. Cross-rope pylons along a straight route could also be placed up to 500m apart along the route whilst strain towers would have to be placed closer together by as much as 150m separation distance.
6. Up to five times as much steel would have to be used in following the proposed alternative route and this would entail a significant increase in resource utilisation as well as construction times which would in turn have further negative environmental impacts and extend the construction time for the projects.
7. The proposed option would not be able to follow existing power line routes in a corridor and would affect virgin areas in this regard. Some of the roads are also considered by the specialists to be tourist routes and placing lines along such roads would be less suitable.
8. The EAP cannot support this approach due to the increase in overall environmental impact significance where a more sensible option is available in the form of straighter lines that follow a corridor of already disturbed land by the same activity.

9. It is expected that the proposed option would make it much more difficult to find suitable routes for placing future power lines, especially the expected 765kV power lines planned for later linking the Delta and Epsilon substations. The northern section indicated as **L1** on **ANNEXURE IV-3** would for instance leave little or no room for the further transmission lines in that area and Eskom is also planning several developments in this area. Several more line crossings would also be necessary which has significant stability and safety implications.
10. The option market as **L15** is not supported by the EAP as indicated earlier in this report and is furthermore not supported by most of the landowners there.
11. Finally the EAP cannot support the further consideration of this option of which the area has essentially been considered during the Scoping Phase of this EIA and mostly found to be a less suitable area for placing the proposed transmission lines. Considering this option at such a late stage would also entail a significant extension of the EIA which has already been extended significantly due to longer public participation periods allowed for by the EAP.

**TABLE 6.8.1.**

Link Points	Name	Location Description	Farm
	CP1	Matimba B (Medupi) Power Station	Naauw Ontkome 509 LQ
	CP2	Linkup of L1, L2 & L3	Zandnek 358 LQ
	CP3	Linkup of L3, L4 & L5	Carolina 76 KQ
	CP4	T-junction of link to CP5 with L4	Faure 72 KQ
	CP5	T-junction of link to CP4 with L5	Faure 72 KQ
	CP6	Linkup of L6, L7, L9 & L10	Vlakplaats 113 KQ
	CP7	Linkup of L10, L13 & L14	Zuid Brabant 292 KQ
	CP8	Linkup of L9, L11 & L12	Groenendal 185 KP
	CP9	Linkup of L8, L14 & L15	Beaufort 326 KQ
	CP10	Linkup of L12, L13, L16 & L17	Uitenhage 211 KP
	CP11	Linkup of L17, L18, L19 & L22	Moorland 234 KP
	CP12	Linkup of L16, L18 & L20	Moorland 234 KP
	CP13	Linkup of L19, L20 & L21	Cyferkuil 330 KQ
	CP14	Linkup of L11, L22, L23 & L24	Rhenosterkop 251 KP
	CP15	Linkup of L21, L24 & L25	Witfontein 396 KQ
	CP16	Linkup of L25, L26, L27 & L28	Kraalhoek 399 KQ
	CP17	T-junction of L29 with L26	Kraalhoek 399 KQ
	CP18	Linkup of L15, L26 & L30	Kraalhoek 399 KQ
	CP19	Connection of L32 with L30	Varkensvlei 403 KQ
	CP20	Linkup of L23, L27 & L34	Elandsfontein 402 KQ
	CP21	Linkup of L30, L33 & L34	Varkensvlei 403 KQ
	CP22	Linkup of L28, L29 & L31	Varkensvlei 403 KQ
	CP23	Linkup of L33, L34 & L35	Haakdoorn 6 JQ
	CP-S	Spitskop Substation	Wildebeestlaagte 411 KQ
	CP-MD	Linkup of L-MD, L-D1 & L-M1	Leewfontein 35 JQ
Route Link Options	L1	Northern link between CP1 and CP2	Various
	L2	Southern link between CP1 and CP2	Various
	L3	Link between CP2 and CP3	Various
	L4	Link between CP3 and CP4	Various
	L5	Link between CP3 and CP5	Various
	L6	Link between CP4 and CP6	Various
	L7	Link between CP5 and CP6	Various
	L8	Link between CP5 and CP9	Various
	L9	Link between CP6 and CP8	Various
	L10	Link between CP6 and CP7	Various
	L11	Link between CP8 and CP14	Various
	L12	Link between CP8 and CP10	Various
	L13	Link between CP7 and CP10	Various
	L14	Link between CP7 and CP9	Various
	L15	Link between CP9 and CP18	Various
	L16	Link between CP10 and CP12	Various
	L17	Link between CP10 and CP11	Various
	L18	Link between CP11 and CP12	Various
	L19	Link between CP11 and CP13	Various
	L20	Link between CP12 and CP 13	Various
	L21	Link between CP13 and CP15	Various
	L22	Link between CP11 and CP14	Various
	L23	Link between CP14 and CP20	Various
	L24	Link between CP14 and CP15	Various
	L25	Link between CP15 and CP16	Various
	L26	Link between CP16 and CP18	Various
	L27	Link between CP16 and CP20	Various
	L28	Link between CP16 and CP22	Various

	L29	Link between CP17 and CP22	Various
	L30	Link between CP18 and CP21	Various
	L31	Link between CP22 and CP23	Various
	L32	Link between CP19 and CP23	Various
	L33	Link between CP21 and CP23	Various
	L34	Link between CP20 and CP23	Various
	L35	Link between CP23 and CP-S	Various
	L36	Link between CP21 and CP-S	Various
	L-MD	Link between CP-S and CP-MD	Various
	L-D1	Link between CP-MD and CP-D1	Various
	L-D2	Eastern link between CP-D1 and CP-D2	Various
	L-D3	Western link between CP-D1 and CP-D2	Various
	L-M1	Link between CP-MD and CP-M1	Various
Route Option Combinations	M&D1	L2, L3, L4, L6, L10, L14, L15, L30, L33, L35, L-MD, L-D1 & L-M1	Various
	ZKA1	L30, L33 & L35	Various
	BE1	L16, L20, L21, L25	Various
	BZ1	L25, L27, L34, L35	Various
	BZ2	L25, L28, L31, L35	Various
	BZ3	L25, L26 to CP17, L29, L31, L35	Various
	BZ4	L25, L26, L30, L32 to CP19, L35	Various
	L-DB	L1, link between CP2 and T-junction with L15	Various

## 6.9. SUBSTATIONS

### 6.9.1. Marang Substation

The expansion of the Marang substation was carefully considered. No additional access roads would be required. No additional buildings would be required. No expansion is required and the necessary earthworks will occur within the existing yard. Associated structures and the necessary fencing will be placed within the existing yard area.

Walking around this site also indicated that no significant impacts are expected due to the expansion of the substation. Around the site there are no visible sites of cultural or historical importance, no sensitive landscapes such as wetlands, streams or rivers, no settlements or residences, no intensive farming, industrial or commercial activities and the site is generally flat. The site is visible within the small valley area where it is located, from the elevated areas to the east and from a distance from the lower lying western areas where mostly mining occurs but visibility is low and due to its remote setting is not considered to be a significant issue.

It is not expected that the expansion will affect drainage significantly and noise and dust pollution will be localised and not affect any nearby settlements or communities. Domestic and industrial waste will have to be managed and disposed of correctly but no significant impact should occur. Due to the already much disturbed surroundings of the site, no sensitive vegetation and no archaeological sites are expected but this should definitely be verified by the applicable specialists when construction commences.

## 7. RECOMMENDATIONS AND CONCLUDING REMARKS

### 7.1. MATIMBA B (MEDUPI)-MARANG POWER LINES

The EAP would like to make the following recommendations:

- a. That all mitigation measures proposed by the various specialists should be considered by the decision-making authority for inclusion in the RoD or into the final EMP.
- b. That landowners should wherever possible, be afforded the first opportunity to obtain the right of maintaining servitudes on their land in agreement with Eskom and the required maintenance specifications for each site. This should be included into the agreement with Eskom when servitude acquisition is undertaken.
- c. That Eskom should agree not to place any further transmission power lines across land portions where there will be additional lines to the two or more existing transmission lines across such land. This should be included into the agreement with Eskom when servitude acquisition is undertaken.
- d. Without compromising technical and safety aspects, the configuration of the new towers should seek to keep the anchor foundations within the 55m servitude.
- e. In the same light, the separations distance between the new line and any adjacent lines should be kept to a minimum. It is generally seen that most environmental impacts are reduced with the smaller distance.
- f. In particular, where the lines pass over croplands, the maximum separation distance should be 80m (centre line to centre line), and tower structures should be placed next to any existing towers as much as possible.
- g. The impact assessment has assumed that the new line will follow existing lines along much of the route. Local deviations identified during negotiation of the servitude may be required. It is considered such localised deviations should not compromise this EIA provided they are assessed during the 'Walk-through' surveys, and that they are within a 500m corridor either side of the route presented in this report.
- h. Walk-through surveys of the route need to be undertaken by key specialists during the design phase. These include the archaeologist and heritage specialists, ecologist or botanist, and avifauna specialist. This survey should take place after the first power line profile is plotted and before the tower locations are finalised.
- i. The first version of the Environmental Management Plan (EMP) should be drafted immediately after award of the RoD. It should include the stakeholder database developed during this EIA.
- j. The Eskom Negotiator should have access to the EIA reports, the RoD and the EMP. The EMP should be updated with information provided by the Negotiator on site specific issues raised by the landowners (e.g. location of gates, access roads, etc.)
- k. Information provided by the specialist 'Walk-through' surveys need to be incorporated into the EMP before completion of the design phase.
- l. A separate full time Environmental Control Officer (ECO) needs to be appointed by Eskom for each main contract during the construction phase. If there are two substation contracts and one power line contract, there will be at least three ECOs. If the power line contract is split into two main contracts, there will be two ECOs for the power line.
- m. Contact details for the ECO (name and cell number) should be made available to all directly affected landowners and any interested and affected party (I&AP).
- n. The location of the construction camps and access roads must be assessed by the ECO and approved by the Eskom EIA Project Manager.
- o. A Geotechnical investigation should be done in the design phase as a matter of course for substations to be expanded. The drainage requirements must be reviewed in the light of the investigation and the issues raised in this report.
- p. The location of the construction camps and access roads must be assessed by the ECO and approved by the Eskom EIA Project Manager.

## 7.2. MARANG SUBSTATION

For the substation it has been determined that no apparent significant impacts are expected. The surrounding area to the substation has no sensitive environmental features that could be observed during the EIA but as a matter of caution it is proposed that the site should be monitored during construction should site clearing reveal any sensitive vegetation and any excavations reveal archaeological artefacts.

## 7.3. ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

The report contains no assumptions. Main uncertainties and knowledge gaps go hand in hand and are as follows:

- a. There is a general uncertainty as to the actual economic impacts that the proposed project will have on land that is used for hunting, lodging, eco-tourism and tourism in general and although there is some indication of a potential negative impact, it is not possible to confirm or verify any quantities or to establish certainty. To date stakeholders have provided very little if any evidence of such impacts. It is however noticeable that there is general consensus amongst the relating communities of an expectancy of such impacts and there is also some indication from estate agents of land value losses.
- b. There is a general concern from many land owners that the visual impact on land owners neighbouring land with power lines, especially when placed on the boundary of a neighbour's land and especially in game farming or tourism areas, could be severely damaging. There is however no basis at this stage of determining visual value or damage that is sufficiently suitable for providing an indication in the report. If the precautionary principle is applied then it could be argued that a visual impact will occur and that at least some mitigation to the effect of absolutely minimising the visibility of the lines and blending the lines in with specific natural environments and backgrounds should be ensured. However no proven and practical options for blending and hiding these types of power lines are currently available or known to exist.

## 7.4. EAP OPINION AND WAY FORWARD

It is the opinion of the EAP that the proposed route with 500m buffer zone as indicated in **ANNEXURE IV-4** should be approved for placing the proposed power line as it is the best possible route from an environmental point of view as determined through extensive public participation, specialist studies and essential design considerations.

Accordingly the EAP would like to propose the issuing of a RoD with applicable conditions.

## ANNEXURE I-1: TECHNICAL EIA STUDY – ASSESSMENT METHODOLOGY

The EAP has determined an EIA study corridor of 5km width with a number of alternative routing options in some of the sections of the route, in particular closer to the substation locations.

Each specialist conducted further detailed studies of these study corridors in order to identify more site specific points or zones that would in their professional opinion, based on their individual assessments, not be preferable for the placement of the proposed transmission power lines. This information is utilised by the EAP as a guidance tool in conjunction with the outcomes of further stakeholder consultation and the outcomes of the public participation process during scoping and the technical EIA phase for final transmission line placement decision-making.

The following table indicates the updated Project Activity Aspects (PAA) which were initially identified during scoping and further refined in the EIA study:

**Table I-1a**

Category	Project Activity Aspect Description	Project Phase	
		Construction (C)	Operational (O)
<b>1. Servitudes</b>	1.1 Servitude clearance	X	
	1.2 Vegetation control		X
	1.3 Servitude rehabilitation	-	-
	1.4 Servitude procurement	X	
	1.5 Servitude location and area - Spread	X	X
	1.6 Servitude location and area - Concentrated	X	X
<b>2. Access</b>	2.1 Gate & fence construction	X	
	2.2 Gate & fence maintenance		X
	2.3 Gate & fence removal	-	-
	2.4 Road construction or clearance	X	
	2.5 Road maintenance		X
	2.6 Road rehabilitation	-	-
	2.7 Access to land by alien elements	X	X
<b>3. Lightning &amp; Fire</b>	3.1 Lightning attraction	X	X
	3.2 Fire from construction workers	X	
	3.3 Fire from maintenance crews		X
	3.4 Fire from lightning	X	X
	3.5 Chemical fires	X	
	3.6 Explosions	X	
<b>4. Employees</b>	4.1 Worker accommodation & facilities	X	
	4.2 Worker movement	X	X
	4.3 Crime, theft and poaching	X	X
<b>5. Vehicles &amp; Equipment</b>	5.1 Parking space	X	
	5.2 Vehicle movement	X	X
	5.3 Vehicle maintenance	X	
	5.4 Equipment storage	X	
<b>6. Waste</b>	6.1 Domestic waste	X	X
	6.2 Industrial waste	X	X
	6.3 Human waste	X	
<b>7. Chemicals</b>	7.1 Chemical spillages	X	
	7.2 Chemical reactions	X	
<b>8. Visibility</b>	8.1 Visibility of construction workers	X	
	8.2 Visibility of demolition crew	-	-
	8.3 Visibility of camps and storage	X	
	8.4 Visibility of construction vehicles	X	
	8.5 Visibility of maintenance vehicles & helicopters		X
	8.6 Visibility of maintenance crew		X
	8.7 Visibility of Structures	X	X
<b>9. Building materials &amp; Structures</b>	9.1 Excess concrete & cement	X	
	9.2 Concrete & cement rubble	X	
	9.3 Remaining Structures	-	-
	9.4 Excavation	X	
	9.5 Structure location/presence		X
	9.6 Structure dimensions		X
	9.7 Structure erection	X	
<b>10. Electricity</b>	10.1 Electro-magnetic fields		X
	10.2 Electrically induced shock		X

It is generally intended that the infrastructure for electricity transmission would last for more than the average person's lifetime. Unless there is a specific reason for the removal of the mentioned infrastructure related to it not being required for its primary purpose any further, it would remain indefinitely or for as long as refurbishment is viable. Over such long periods of time several changes to the environment is likely and for this reason it is not foreseeable to the EAP what potential impacts on the environment could occur should a decommissioning phase in fact take place. For this reason, the decommissioning phase is not evaluated. The following Environmental Aspects as revised after scoping are considered in this EIA study:

**Table I-1b**

Main Aspect Category	Environmental Aspect Sub-category	Focus Point
<b>A. Aesthetic</b>	Visibility	Visual Sensitivity Zones
	Aesthetic Blending	
<b>B. Atmospheric</b>	Climate & Weather (Wind, Temperature, Precipitation)	Dust Pollution Levels
	Air Quality	
	Sound Quality	
<b>C. Ecological</b>	Fauna	Avifauna Sensitivity Zones
	Flora	Ecological Sensitivity Zones
	Ecology Systems	
<b>D. Geological</b>	Geological Structure	Surface Geology Sensitivity
	Vibration	
<b>E. Hydrological</b>	Water Quality	Perennial Rivers ('Not Preferred' Areas)
	Water Quantity	Wetlands ('Not Preferred' Areas)
	Water Systems (Wetlands, aquifers, rivers and streams)	
<b>F. Pedological</b>	Soil Quality	Soil Potential
	Soil Capability	Soil Landtype Sensitivity
		Soil Depth Sensitivity
		Clay Content Sensitivity
		Health and Safety Risks
<b>G. Sociological</b>	Social Systems	Mental Aspect - Sense of Place
		Local Economies
		Archaeological Sites ('Not Preferred' Areas)
	Socio-economic Systems	Historical Sites ('Not Preferred' Areas)
		Heritage (Historicity, Palaeontology & Archaeology)
<b>H. Spatial</b>	Space Utilisation	Population Density Sensitivity Zones - Residential Areas ('Not Preferred' Areas)
		Conservation ('No Go' Areas)
		Tourism Zones ('Not Preferred' Areas)
		Mining Zones
		Industrial Zones ('Not Preferred' Areas)
		Tourism Potential
		Economic Development Potential
		Agricultural Potential
<b>I. Topographical</b>	Topographical Structure	Ridges ('Not Preferred' Areas)
		Mountains ('Not Preferred' Areas)

Note that focus points have been listed in the above table. These focus points are used during the technical EIA phase as the basis for determining points or zones that: <sup>1</sup>are not accessible ('No Go' Points or Areas) for placing the transmission power line servitudes; <sup>2</sup>are areas that should be avoided at all possible cost ('Not Preferred' Areas) due to specific accepted attributes generally assigned by the community or government or by the scientific community (in this case the appointed EIA specialists) due to known potential significant environmental risks. Impacts are considered in terms of being positive or negative and in terms of frequency, duration, extent, intensity and probability. These ratings are summed to indicate a significance rating of high, medium or low. The following table indicates the rating method, values and colour codes:

**Table I-1c**

Rating Aspect:	Rating Levels:				
Frequency:	Infrequent = 1	Frequently = 2	Constantly = 3		
Duration:	Short term = 1	Medium term = 2	Long term = 3	Permanent = 4	
Extent:	On-site = 1	Local = 2	Regional = 3	National = 4	International = 5
Intensity:	Processes continue undisturbed = 1	Processes continue in a modified way = 2	Processes stop = 3		
Probability:	Unlikely = 1	Possible = 2	Likely = 3	Definite = 4	
Significance:	Low: 5-9	Medium: 10-14	High: 15-19		
Positive:	(Value X -1)	(Value X -1)	(Value X -1)		
Negative:	(Value X 1)	(Value X 1)	(Value X 1)		
No Go = ∞					
No Impact = 0					



Following is an explanation of the terms used in the rating levels:

**Table I-1d**

<b><u>Frequency:</u></b>	
How frequently the considered Project Activity Aspect impacts on the considered Environmental Aspect.	
<b><u>Infrequent:</u></b>	On some rare occasions, where occurrences would be the exception rather than the rule.
<b><u>Frequently:</u></b>	On regular occasions and at intervals, although not constantly or necessarily according to a set pattern.
<b><u>Constantly:</u></b>	Continuously or always, without end and normally according to a set pattern.
<b><u>Duration:</u></b>	
For what time period the considered Project Activity Aspect impacts on the considered Environmental Aspect.	
<b><u>Short term:</u></b>	Less than five years.
<b><u>Medium term:</u></b>	Five to fifteen years.
<b><u>Long term:</u></b>	The impact ends when the activity ends.
<b><u>Permanent:</u></b>	The impact continues even after the activity ends.
<b><u>Extent:</u></b>	
The scale of the area that the considered Project Activity Aspect impacts on, with regards to the considered Environmental Aspect.	
<b><u>On-site:</u></b>	On the Project Activity property or expected authorised area.
<b><u>Local:</u></b>	Within one kilometre from the Project Activity property or expected authorised area.
<b><u>Regional:</u></b>	Within an approximate 100 kilometre radius of or distance from the Project Activity property or expected authorised area or within a defined Province if applicable.
<b><u>National:</u></b>	Within the Republic of South Africa.
<b><u>International:</u></b>	Across international borders.
<b><u>Intensity:</u></b>	
The intensity of the considered Project Activity Aspect's impact on the considered Environmental Aspect.	
<b><u>Low Intensity:</u></b>	Environmental processes continue undisturbed or continue to the same effect.
<b><u>Medium Intensity:</u></b>	Environmental processes continue in a modified way and continue to a similar effect.
<b><u>High Intensity:</u></b>	Environmental processes stop or are altered to result in a different effect.
<b><u>Probability:</u></b>	
The likelihood or probability of the considered Project Activity Aspect of having an impact on the considered Environmental Aspect. <i>(An estimated probability is possible only from reasonable experience in environmental matters, legal aspects and knowledge of the relevant industry.)</i>	
<b><u>Unlikely:</u></b>	The chance of occurrence is very low and it is not expected to occur. An estimated statistical probability of less than 15% is determined if it is calculable.
<b><u>Possible:</u></b>	There is a chance of occurrence but there is no clear indication whether it would be possible. An estimated statistical probability of between 15% and 75% is determined if calculable.
<b><u>Likely:</u></b>	There is a good chance of occurrence and there is a clear indication that it would be possible. An estimated statistical probability of between 75% and 100% is determined if calculable.
<b><u>Definite:</u></b>	There is certainty that an occurrence will take place.
<b><u>Significance:</u></b>	
The significance is calculated by adding the values of the respective Rating Aspects to acquire a total. The result gives an indication of whether an impact is to be considered during decision-making.	
<b><u>Low:</u></b>	The impact on the Environmental Aspect does not influence a decision on continuation.
<b><u>Medium:</u></b>	The impact on the Environmental Aspect influences a decision on continuation if no mitigation is possible.
<b><u>High:</u></b>	The impact on the Environmental Aspect influences the decision on continuation even if some mitigation is possible. Continuation is not possible if no mitigation is possible.

The following is an example of an assessment sheet used to determine the value for each coordinate block in the impact matrix:

Coordinate:	Rating Aspect:	Value:
A 1.1	Frequency	1
EA:	Duration	2
Agricultural Potential	Extent	3
PAA:	Intensity	4
Servitude Clearance	Probability	5
Significance:	High	15
Negative		
Impact Description:		

**FIGURE I-1A**

## **ANNEXURE I-2A: TECHNICAL NOTES: EMFS AND HEALTH RISK**

## **ANNEXURE I-2B: TECHNICAL NOTES: UNDERGROUNDING**

### **ANNEXURE I-3: EIA – PROJECT MANAGER’S CV**

## **ANNEXURE I-4: EIA – PROJECT REVIEWER’S CV**

## **ANNEXURE I-5: EIA – PPP PROJECT MANAGER’S CV**

## **ANNEXURE I-6: DRAFT EMP**