



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA  
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

Reference: 12/12/20/2367

Enquiries: Ms Yolisa Zokufa

Telephone: (012) 395 1782 Fax: (012) 320 7539 E-mail: yzokufa@environment.gov.za

Mr Phillip Hines  
The South African Heritage Resources Agency  
APM Unit  
111 Harrington Street  
CAPE TOWN  
8001

Fax no: 021 462 4509

PER FACSIMILE / MAIL

Dear Mr Hines

**APPLICATION FOR AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT: PROPOSED CONSTRUCTION OF 2X132KV POWER LINES EACH BETWEEN THE PROPOSED NEW MARBLE HALL MT AND THE EXISTING WOLVEKRALL SUBSTATION, MPUMALANGA PROVINCE**

The Draft Basic Assessment Report for the above mentioned project refers.

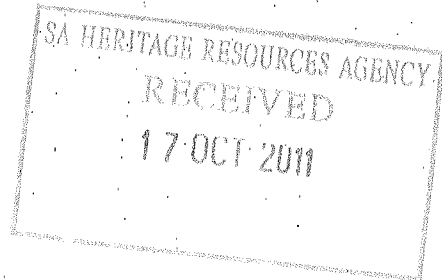
The Department of Environmental Affairs hereby request, in terms of section 24 (O) (2) of the National Environmental Management Act (NEMA), your comments on the above report. Your comments must be submitted to this Department within 40 days from the date of this letter to.

Mr Dumisane Mthembu  
Director: Environmental Impact Evaluation  
Department of Environmental Affairs  
Private Bag X447  
Pretoria  
0001

Please indicate the above reference number on your comments. Please also note that should the Department not receive your comment within the 40 days from the date of signature of this letter, the Department will accept that you agree with the content and findings of the report.

Yours sincerely

Ms ML Solomons  
DEPUTY DIRECTOR: ENVIRONMENTAL IMPACT EVALUATION  
Department of Environmental Affairs  
Date: 17/10/2011





## environmental affairs

Department:  
Environmental Affairs  
**REPUBLIC OF SOUTH AFRICA**

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA  
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2882

Reference: 12/12/20/2368

Enquiries: Ms Yolisa Zokufa

Telephone: (012) 395 1782 Fax: (012) 320 7539 E-mail: yzokufa@environment.gov.za

Mr Phillip Hines  
The South African Heritage Resources Agency  
APM Unit  
111 Harrington Street  
CAPE TOWN  
8001

Fax no: 021 462 4509

**PER FACSIMILE / MAIL**

Dear Mr Hines

**APPLICATION FOR AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT: PROPOSED CONSTRUCTION OF 132KV POWERLINE NYLSTROOM-KAREEFONTEIN-VAALWATER, LIMPOPO PROVINCE**

The Draft Basic Assessment Report for the above mentioned project refers.

The Department of Environmental Affairs hereby request, in terms of section 24 (O) (2) of the National Environmental Management Act (NEMA), your comments on the above report. Your comments must be submitted to this Department within 40 days from the date of this letter to.

Mr Dumisane Mithembu  
Director: Environmental Impact Evaluation  
Department of Environmental Affairs  
Private Bag X447  
Pretoria  
0001

Please indicate the above reference number on your comments. Please also note that should the Department not receive your comment within the 40 days from the date of signature of this letter, the Department will accept that you agree with the content and findings of the report.

Yours sincerely

Ms ML Solomons  
DEPUTY DIRECTOR: ENVIRONMENTAL IMPACT EVALUATION  
Department of Environmental Affairs  
Date: 17/12/2011



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

Private Bag X 447 · PRETORIA · 0001 · Fedsure Building · 315 Pretorius Street · PRETORIA  
Tel (+ 27 12) 310 3911 · Fax (+ 2712) 322 2682

Reference: 12/12/20/2368

Enquiries: Ms Yolisa Zokufa

Telephone: (012) 395 1782 Fax: (012) 320 7539 E-mail: yzokufa@environment.gov.za

Mr Phillip Hines  
The South African Heritage Resources Agency  
APM Unit  
111 Harrington Street  
CAPE TOWN  
8001

Fax no: 021 462 4509

PER FACSIMILE / MAIL

Dear Mr Hines

**APPLICATION FOR AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT: PROPOSED CONSTRUCTION OF 132KV POWERLINE NYLSTROOM-KAREEFONTEIN-VAALWATER, LIMPOPO PROVINCE**

The Draft Basic Assessment Report for the above mentioned project refers.

The Department of Environmental Affairs hereby request, in terms of section 24 (O) (2) of the National Environmental Management Act (NEMA), your comments on the above report. Your comments must be submitted to this Department within 40 days from the date of this letter to.

Mr Dumisane Mthembu  
Director: Environmental Impact Evaluation  
Department of Environmental Affairs  
Private Bag X447  
Pretoria  
0001

Please indicate the above reference number on your comments. Please also note that should the Department not receive your comment within the 40 days from the date of signature of this letter, the Department will accept that you agree with the content and findings of the report.

Yours sincerely

Ms ML Solomons  
DEPUTY DIRECTOR: ENVIRONMENTAL IMPACT EVALUATION  
Department of Environmental Affairs  
Date: 17/12/2011

Awaiting  
KML FILE



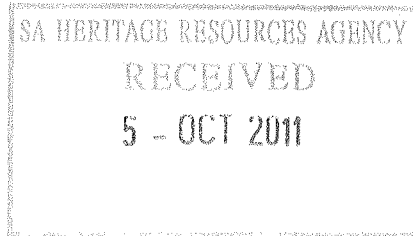
## LANDSCAPE DYNAMICS

### ENVIRONMENTAL CONSULTANTS

CK 97/08197/23 VAT Regd: 4900171176  
Managing Member: A. Grobler BL(Pret.)

50 Herbert Baker Str PO Box 947  
Groenkloof Groenkloof  
Pretoria Pretoria  
0181 0027

Tel: 012 460 6043  
Fax: 012 346 2356  
Cell: 082 566 4530  
email: [agrobler@landscapedynamics.co.za](mailto:agrobler@landscapedynamics.co.za)



1 October 2011

The Manager : APM Unit  
The South African Heritage Resources Agency

Delivered via courier to : 111 Harrington Street; Cape Town; 8001

For attention : Mr Philip Hines (tel 021 462 4502)

Dear Sir

**ESKOM MARBLE HALL NDP PROJECT: WOLVEKRAAL TO MOUTSE ((THE CONSTRUCTION OF AN APPROXIMATELY 42 KM 132KV POWERLINE FROM THE EXISTING WOLWEKRAAL SUBSTATION TO AND INCLUDING A NEW MOUTSE SUBSTATION WITH COMMUNICATION TOWER.))**

Please find attached hereto a copy of the DRAFT BASIC ASSESSMENT REPORT that is now available for comment. Please provide us with final comment, if any, within 40 days from the date of this letter.

We trust you would the above in order, but please contact this office should there be any problem whatsoever.

Kind regards

Annelize Grobler  
Landscape Dynamics

**ESKOM MARBLE HALL NDP PROJECT:  
WOLVEKRAAL TO MOUTSE  
BASIC ASSESSMENT REPORT  
*DRAFT***

September 2011

Compiled by:



**LANDSCAPE  
DYNAMICS**

**Landscape Dynamics Environmental Consultants**

PO Box 947  
GROENKLOOF  
Pretoria  
0027  
Tel (012) 460 6043  
Fax (012) 346 2356

Applicant :

**Eskom Holdings Limited  
(Eskom Distribution, Menlyn Office)**

PO Box 36099  
MENLO PARK, Pretoria  
0001  
Tel 012 421 3353  
Fax 086 662 0183

# LIST OF CONTENTS

## SECTION A: ACTIVITY INFORMATION

1. ACTIVITY DESCRIPTION
2. FEASIBLE AND REASONABLE ALTERNATIVES
3. ACTIVITY POSITION
4. PHYSICAL SIZE OF THE ACTIVITY
5. SITE ACCESS
6. SITE OR ROUTE PLAN
7. SITE PHOTOGRAPHS
8. FACILITY ILLUSTRATION
9. ACTIVITY MOTIVATION
10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES
11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT
12. WATER USE
13. ENERGY EFFICIENCY

## SECTION B: SITE / AREA / PROPERTY DESCRIPTION

1. GRADIENT OF THE SITE
2. LOCATION IN LANDSCAPE
3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE
4. GROUNDCOVER AND HABITAT
  - 4.1 ECOLOGICAL STUDY
  - 4.2 BIRD IMPACT STUDY
5. LAND USE CHARACTER OF SURROUNDING AREA
6. CULTURAL/HISTORICAL FEATURES

## SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT
2. CONTENT OF ADVERTISEMENTS AND NOTICES
3. PLACEMENT OF ADVERTISEMENTS AND NOTICES
4. DETERMINATION OF APPROPRIATE MEASURES
5. COMMENTS AND RESPONSE REPORT
6. AUTHORITY PARTICIPATION
7. CONSULTATION WITH OTHER STAKEHOLDERS

## SECTION D: IMPACT ASSESSMENT

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES
2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES
3. ENVIRONMENTAL IMPACT STATEMENT

## SECTION E. RECOMMENDATION OF PRACTITIONER

## SECTION F: APPENDIXES

### Appendix A: Site plan(s)

- Route alignments initially investigated
- Proposed Route with Viable Alternative
- Route coordinates (every 250 m intervals)

### Appendix B: Photographs

- Photographs of the proposed route

### Appendix C: Facility illustration(s)

- Details of the proposed powerline structures

### Appendix D: Specialist reports (including terms of reference)

- Ecological Assessment – Enviroguard Ecological Services CC
- Bird Impact Assessment Study - Chris van Rooyen Consulting
- Phase 1 Heritage Impact Assessment - Archaetnos Culture & Cultural Resource Consultants

### Appendix E: Comments and Responses Report (with written correspondence)

### Appendix F: Environmental Management Programme (EMPr)

### Appendix G: Other information

- **Public Participation Programme**
  - PPP process followed
  - Newspaper advertisements
  - Proof of onsite notification
  - First Phase Notification Letter and Invitation to Open Day
  - Open Day attendance list (held on 2 March 2011)
  - Meeting held with the Zamenkomst Tribal Authority
    - Attendance Registrar
    - Notes on meeting
  - Register of Interested & Affected Parties
  - List of Directly Affected Landowners (for both Preferred and Viable Alternative Routes)
- **Landscape Dynamics Company Profile**

## LIST OF ABBREVIATIONS

BAR	Basic Assessment Report
C-Plan	Conservation Plan
DEA	National Department of Environment Affairs
DWA	National Department of Water Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Plan/Programme
ha	Hectare(s)
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
<i>in situ</i>	In the same place
m <sup>3</sup>	Cubic metres
n/a	Not applicable
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
SAHRA	South African Heritage Resources Agency
WULA	Water Use License Application

## ELECTRICAL TERMS AND ABBREVIATIONS

Eskom	South Africa Electricity Supply
ICNIRP	International Commission for Non-Ionising Radiation Protection
NDP	National Development Plan

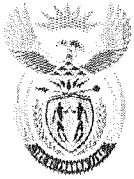
### *Voltage :*

kV	Kilovolt (1kV = 1 000V)
MVA	Mega Volt Ampère

### *Units of power :*

kW	Kilowatt (1kW= 1 000W)
MW	Megawatt (1MW=1 000kW)





## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

Application Number:

Date Received:


Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

### Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
3. Where applicable **tick** the boxes that are applicable in the report.
4. An incomplete report may be returned to the applicant for revision.
5. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
6. This report must be handed in at offices of the relevant competent authority as determined by each authority.
7. No faxed or e-mailed reports will be accepted.
8. The report must be compiled by an independent environmental assessment practitioner.
9. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
10. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
11. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

## SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES

NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for appointment of a specialist for each specialist thus appointed. Any specialist reports must be contained in Appendix D.

### 1. ACTIVITY DESCRIPTION

Describe the activity, which is being applied for, in detail<sup>1</sup>:

The project involves the construction of an approximately 42 km 132kv powerline from the existing Wolvekraal Substation to and including a new Moutse Substation. It is also proposed to construct a communication tower at the new substation. The size of the site required for the substation is 100mX150m. The servitude width of the 132kV line will be 31 meters (15,5m on both sides of the powerline poles). Mono-pole steel structures will be used.

The project area includes the macro area directly south and west of Marble Hall in the Limpopo Province (was Mpumalanga Province up to July 2011). Affected farms include portions of the farms Keerom 729-KS; Makeepsvley 728-KS; Zamenkomst 730-KS; Rhenosterfontein 731-KS; Tambotielaagte 733-KS; Gruysbank 5-JS; Loskop Noord 12-JS; Claremont 734-KS; Rietfontein 736-KS; Elandsdrift 8-JS; Uyskraal 10-JS; Marble Hall 29-JS; Klipsyfering 2-JS; Toitskraal 2-JS; Slagboom 7-JS; Elandslaagte 9-JS; Klippot 11-JS; Wolvenkraal 13-JS; Kleinklippot 11-JS; Blaauwildebeestfontein 16-JS; Vaalfontein 14-JS; Tambotiewaters 30-JS; Krokodilsdrift 25-JS; Klipbank 28-JS; Kleinwaterfontein 42-JS and Slagboom 7-JS.

A final viable route and viable alternative had been identified after a 100m corridor for three different route options were investigated by the specialists and professional team appointed for this project.

The environment is mostly disturbed by agricultural activities. This includes ploughed fields and orchards, including irrigation channels and centre pivot sprayers. Some natural vegetation is present on game farms or adjacent to rivers, however even these are at least partially disturbed.

The relevant listed activity for which environmental authorisation is required is the following :

R544, 18 June 2010	Nr 10	The construction of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 Kilovolts. <b>A 132kV power line is being proposed.</b>
R544, 18 June 2010	Nr 23	The transformation of undeveloped, vacant or derelict land to (ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; except where such transformation takes place for linear

<sup>1</sup> Please note that this description should not be a verbatim repetition of the listed activity as contained in the relevant Government Notice, but should be a brief description of activities to be undertaken as per the project description.

		activities. <i>A substation on a site of approximately 100mX150m is planned as part of the application.</i>
--	--	---

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

**“alternatives”**, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.

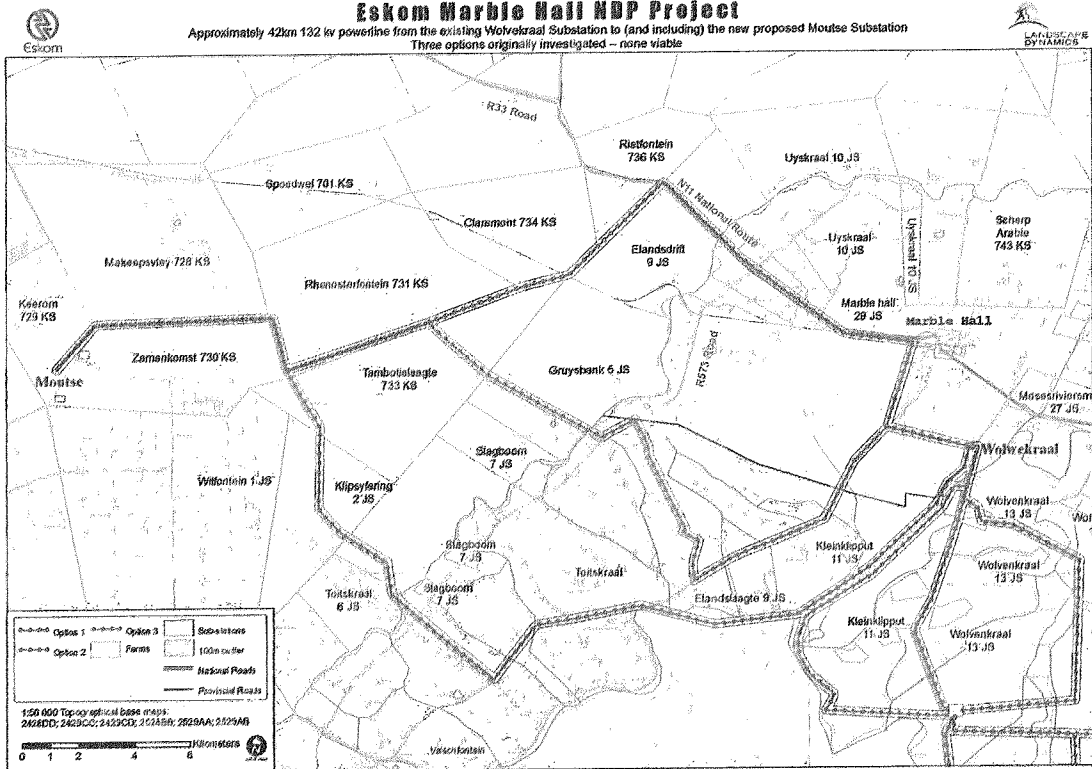
Describe alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. The determination of whether site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

### ROUTE ALTERNATIVES

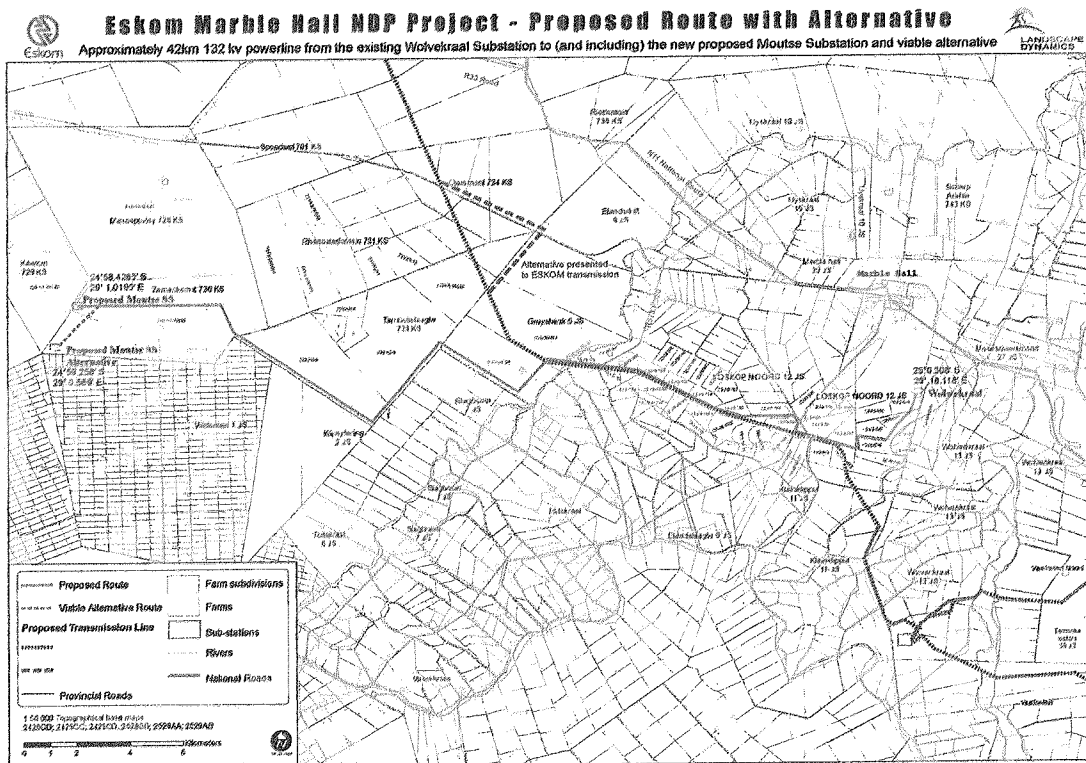
#### Options originally investigated

Three potential route alignments were investigated during the initial stages of this Basic Assessment process by the specialists as well as the professional team appointed for this project. However, during the Public Participation Process and detail negotiations with affected landowners, it was realised that not one of these three options originally investigated were feasible, mostly as a result of existing land use, unnecessary length of powerline route as well as the fact that the initial planning did not accommodate the proposed Transmission lines for the area. These options in the map below will therefore not be further discussed and/or assessed in this report.

**Options originally investigated – none feasible**



**Proposed Route and Viable Alternative**



## ALTERNATIVE 1: Preferred Route Alternative

This Preferred Route Alternative is proposed because :

- It runs as far as possible adjacent to the proposed Eskom Transmission route (the Burotho-Marble Hall 400kV – indicated as a purple line above) in an attempt to restrict visual impact and impact on the environment and agricultural activities.
- It is the shortest viable route between the existing Wolvekraal Substation and the proposed new Moutse Substation site – economically viable for Eskom.
- The route runs as far as possible along farm boundaries, existing fences and roads.
- Minimal and no impact on irrigation systems or any other structures and agricultural activities will occur. Specific detail and landowner requirement on site will be clarified during the negotiation period.
- Impact on natural habitat will be minimised. The route follows as far as possible existing infrastructure such as farm roads and game fences, mostly along disturbed land.
- No wetland areas will be crossed.
- Impact on game will be minimal.
- Reasonable access is possible.
- The route was tested with all the landowners during the meetings with individuals and the Public Open Day. The route as proposed had been accepted in principle by the potentially affected landowners.
- A 100m corridor was investigated to allow for slight deviations along the final proposed route once the final land acquisition documents are signed – to accommodate details such as existing and planned agricultural activities (i.e. sheds, pivot irrigation structures, etc.)

## ALTERNATIVE 2: Feasible Alternative

This alternative route runs for most part on the same route as the Preferred Route Alignment, but the last portion of the route deviates slightly to an alternative substation site option. This alternative is indicated in a red stipple line. Route Alternative 2 is just as viable from an impact point of view as the Preferred Route Alternative.

Paragraphs 3 – 13 below should be completed for each alternative.

### 3. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.  
List alternative sites, if applicable.

#### Alternative:

Alternative S1<sup>2</sup> (preferred or only site alternative)

Alternative S2 (if any)

Alternative S3 (if any)

Latitude (S):		Longitude (E):	
0	'	0	'
0	'	0	'
0	'	0	'

<sup>2</sup> "Alternative S.." refer to site alternatives.

**In the case of linear activities:**

**Alternative 1 (Preferred Alternative):**

Alternative S1 (preferred or only route alternative)

- Starting point of the activity – Wolvekraal Substation
- Middle/Additional point of the activity
- End point of the activity – New Moutse Substation Site

Latitude (S):

Longitude (E):

25°	0.3079'	29°	18.118'
24°	59.861"	29°	9.519'
24°	58'4265"	29°	1'0195'

**Alternative 2 (Viable Alternative)**

- Starting point of the activity – Wolvekraal Substation
- Middle/Additional point of the activity
- End point of the activity – Substation Site Alternative

25°	0.337'	29°	18.147'
24°	59.861'	29°	9.519'
24°	59.258'	29°	0.569'

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

**Please find this list with 250 m coordinates attached in Appendix A.**

**4. PHYSICAL SIZE OF THE ACTIVITY**

Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

**Alternative:**

- Alternative A1 (Preferred Substation Site)
- Alternative A2 (Viable Alternative Substation Site)
- Alternative A3 (if any)

**Size of the activity:**

15 000 m <sup>2</sup>
15 000 m <sup>2</sup>
m <sup>2</sup>

**or, for linear activities:**

- Alternative A1 ((Preferred Alternative)
- Alternative A2 (Viable Alternative)
- Alternative A3 (if any)

Approximately 42km
Approximately 43km
Km

Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

**Size of the site/servitude:**

- Alternative A1 (Preferred Alternative)
- Alternative A2 (Viable Alternative)
- Alternative A3 (if any)

1 302 000 m <sup>2</sup>
1 333 000m <sup>2</sup>
m <sup>2</sup>

**5. SITE ACCESS**

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

YES	NO
	m

Describe the type of access road planned:

The powerline runs along existing farm boundaries and farm roads all the way from the Wolvekraal Substation up to the proposed new Moutse Substation. Existing farm roads will be used for access. The appropriate access routes and roads will be negotiated with each affected landowner before construction commences. If any roads are to be built, it would most probably not be longer than 250 metres and it will not be constructed in any sensitive and/or protected areas as described in Notice 546 of NEMA.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

## 6. SITE OR ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- 6.1 the scale of the plan which must be at least a scale of 1:500;
- 6.2 the property boundaries and numbers of all the properties within 50 metres of the site;
- 6.3 the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- 6.4 the exact position of each element of the application as well as any other structures on the site;
- 6.5 the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, storm water infrastructure and telecommunication infrastructure;
- 6.6 all trees and shrubs taller than 1.8 metres;
- 6.7 walls and fencing including details of the height and construction material;
- 6.8 servitudes indicating the purpose of the servitude;
- 6.9 sensitive environmental elements within 100 metres of the site or sites including (but not limited thereto):
  - rivers;
  - the 1:100 year flood line (where available or where it is required by DWA);
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or invested with alien species);
- 6.10 for gentle slopes the 1 metre contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- 6.11 the positions from where photographs of the site were taken.

## 7. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this form. It must be supplemented with additional photographs of relevant features on the site, if applicable.

## 8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

## 9. ACTIVITY MOTIVATION

### 9(a) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development phase of the activity?

What is the expected value of the employment opportunities during the development phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

Unknown	
Unknown	
YES	NO
YES	NO
None	
R0	
0%	
None	
R0	
0%	

### 9(b) Need and desirability of the activity

Motivate and explain the need and desirability of the activity (including demand for the activity):

NEED:			
1.	Was the relevant provincial planning department involved in the application?	YES	NO
2.	Does the proposed land use fall within the relevant provincial planning framework?	YES	NO
3.	If the answer to questions 1 and / or 2 was NO, please provide further motivation / explanation:		

DESIRABILITY:			
1.	Does the proposed land use / development fit the surrounding area?	YES	NO
2.	Does the proposed land use / development conform to the relevant structure plans, SDF and planning visions for the area?	YES	NO
3.	Will the benefits of the proposed land use / development outweigh the	YES	NO



	negative impacts of it?		
4.	If the answer to any of the questions 1-3 was NO, please provide further motivation / explanation:		
5.	Will the proposed land use / development impact on the sense of place?	YES	NO
6.	Will the proposed land use / development set a precedent?	YES	NO
7.	Will any person's rights be affected by the proposed land use / development?	YES	NO
8.	Will the proposed land use / development compromise the "urban edge"?	YES	NO
9.	If the answer to any of the question 5-8 was YES, please provide further motivation / explanation.		
	<p><b>Sense of place</b></p> <p>The powerline will run mostly along existing infrastructure such as farm fences and agricultural activities. Approximately 40% of the route is also planned to run parallel to the proposed Eskom Transmission 400kV line which is huge compared to the proposed 132kV line. The proposed line does not cross any pristine areas not already affected by human activities.</p> <p>The surrounding landowners and landowners along the route in this area were all informed of this project and no significant objections that could alter the viability of the powerline had been received. Objections in terms of visual impact was received from some of the game farm owners and the route identification was done in such a manner to cause the least visual impact on their properties and consensus was reached with them in this regard.</p> <p>It can therefore be concluded that the altering of the sense of place associated with this project can be considered as acceptable.</p>		

<b>BENEFITS:</b>			
1.	Will the land use / development have any benefits for society in general?	YES	NO
2.	<p>Explain:</p> <p>Demand for the activity:  There is a very huge load growth in the macro area of Groblersdal contributed by the electrification load, new mining loads as well as new residential developments in the area. The existing network is currently experiencing low voltages on the 132kV and the 88kV networks. Thermal limits will soon be reached and the network is therefore unable to cater for the future load due to these constraints. Bulk customer requests in the macro area of Groblersdal and Marble Hall include a 500 unit mixed income residential development, a 212 stand Marble Hall Golf Estate, a 25 unit resort development, a 340 stand low income residential development, Paprika Chemicals Establishment, Groblersdal and Marble Hall Municipalities' increase, two pump stations of the Department of Water Affairs as well as Roosenekal town upgrade. The new Marble Hall MTS Transmission Substation will therefore be introduced in the existing Simpron network to de-load the existing MTS and to</p>		

	strengthen the distribution network. The Marble Hall NDP Project is planned to integrate the new Marble Hall MTS into the Distribution network. This Eskom NDP project includes the following three projects:	
	<ul style="list-style-type: none"> <li>• Approximately 13km 132kV powerline from the Groblersdal Substation to the new Marble Hall MTS - the subject of this Basic Assessment;</li> <li>• Two approximately 14km 132kV powerlines from Marble Hall MTS to the Wolwekraal Substation;</li> <li>• Approximately 42km 132kV powerline from Wolwekraal Substation to and including the new proposed Moutse Substation (<b>this application</b>).</li> </ul>	
3.	Will the land use / development have any benefits for the local communities where it will be located?	YES NO
4.	<p>Explain:</p> <p>Proper and reliable infrastructure creates a sense of well-being and prosperity. The long-term, regional benefits of reliable power supply is important for economic growth in the area that would result in new development, stimulation of the markets, optimal utilisation of existing infrastructure as well as the upgrade and maintenance of infrastructure. The resultant socio-economic benefits are obvious. Job opportunities will be created - short term during construction of the developments and long term during the operational phases of the development (maintenance, gardens, domestic workers, security personnel, etc.).</p> <p>Existing Eskom users in the area will benefit by the proposed 132kV line because it is anticipated that the network performance will improve and the duration and frequency of supply interruptions will be minimal.</p>	

## 10. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline:	Administering authority:	Date:
National Environmental Management Act (107 of 1998)	Department of Environmental Affairs	1998
Environment Conservation Act (Act 73 of 1989)	Department of Environmental Affairs	1989
Bonn Convention on the Protection of Migratory Species of Wild Animals	Department of Environmental Affairs	
National Heritage Resources Act (25 of 1999)	Department of Arts and Culture	1999
Paris Convention for the Protection of the World Cultural and Natural Heritage	Department of Arts and Culture	
White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (GN 1095, 28 July 1997)	Responds to the United Nations Convention on Biological Diversity	1997
Conservation of Agricultural Resources Act (43 of 1983)	Department of Agriculture	1983
National Forests Act (No 84 of 1998) and Government Notice 1339 of 6 August 1976 (promulgated under the Forest Act (No 122 of 1984) for protected tree species), the removal, relocation or pruning of any protected plants	Department of Agriculture	1998
Endangered and Rare Species of Fauna and Flora (AN 1643 February 1984)	Lists endangered species in terms of the Nature Conservation Ordinance, 1983	1984

	(Ordinance 12 of 1983)	
RAMSAR Convention on Wetlands of International Importance Especially as Waterfowl Habitat	Department of Water Affairs	
National Water Act (Act 36 of 1998)	Department of Water Affairs	1998
Water Act (54 of 1956) - This regulation prescribes standards and limits (general and special standards) for the discharge of effluent to any water resource (GN 991 of 18 May 1984)	Department of Water Affairs	1956

## 11. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### 11(a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
Approximately 2.4m <sup>3</sup>	

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

Unusable waste, steel and aluminium will be sold to scrap dealers for recycling.

Where will the construction solid waste be disposed of (describe)?

It will be transported off site by the contractor and returned to Eskom stores where scrap will be handed over to buyers. Any waste that cannot be recycled will be transported to appropriate waste sites.

Will the activity produce solid waste during its operational phase?  
If yes, what estimated quantity will be produced per month?

YES	NO
m <sup>3</sup>	

How will the solid waste be disposed of (describe)?

Not applicable

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Not applicable

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
-----	----

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

If yes, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

### 11(b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
m <sup>3</sup>	
Yes	NO

If yes, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO
-----	----

If yes, provide the particulars of the facility:

Facility name:	Not applicable		
Contact person:			
Postal address:			
Postal code:			
Telephone:	Cell:		
E-mail:	Fax:		

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

No waste water will be generated during the construction or operational phase of the powerline.

### 11(c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

No significant emissions are released. Studies undertaken on behalf of Eskom confirmed that calculations of electric and magnetic field levels created by overhead power lines where the public may be exposed are well within the ICNIRP guidelines. Note that ICNIRP refers to Non-ionising Radiation Protection which receives world-wide support and is endorsed by the Department of Health in South Africa

### 11(d) Generation of noise

Will the activity generate noise?

YES	NO
YES	NO

If yes, is it controlled by any legislation of any sphere of government?

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the noise in terms of type and level:

No permanent noise pollution will occur as a result of the proposed activity. Note however that limited noise as a result of construction activities will occur during the construction phase. This is however insignificant due the fact that the project will be constructed within rural (farm) areas where it will not create a disturbance and/or nuisance.

## 12. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es)

municipal	water board	groundwater	river, stream, dam or lake	other	the activity will not use water
-----------	-------------	-------------	-------------------------------	-------	---------------------------------

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

Litres	
YES	NO

Does the activity require a water use permit from the Department of Water Affairs?

If yes, please submit the necessary application to the Department of Water Affairs and attach proof thereof to this application if it has been submitted.

## 13. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

Not applicable – the proposed activity is an Eskom electricity project

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

Not applicable – the proposed activity is an Eskom electricity project

## SECTION B: SITE / AREA / PROPERTY DESCRIPTION

### Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section C and indicate the area, which is covered by each copy No. on the Site Plan.

Section C Copy No.  
(e.g. A):

2. Paragraphs 1 - 6 below must be completed for each alternative.

### Please note:

Alternative 1 (The Preferred Route) and the Alternative 2 (The Viable Alternative) (as described under Section A, paragraph 2 of this report) runs for most part (98%) on the same route. The alternative proposed as well as the alternative substation site are both situated on vacant tribal land with the same characteristics (flat topography and site overgrazed). It is therefore recommended, in order to streamline the report, that this section is not duplicated for both these two alternatives. The information is the same for both alternatives.

3. Has a specialist been consulted to assist with the completion of this section? 

YES	NO
-----	----

  
If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed. All specialist reports must be contained in Appendix D. These forms are being submitted with the Application Form.

Property description /  
physical address:

Please refer to Appendix G for a list of all property owners.

(Farm name, portion etc.) Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application.

Nearest town or districts

The powerline starts just south of town of Marble Hall.

In instances where there is more than one town or district involved, please attach a list of towns or districts to this application.

Current land-use zoning:

The powerline transverses mainly agricultural lands, some game farms and also tribal land.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

- Is a change of land-use or a consent use application required?  
Must a building plan be submitted to the local authority?

YES	NO
YES	NO

Locality map:

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.) The map must indicate the following:

- an indication of the project site position as well as the positions of the alternative sites, if any;
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection)

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

### Alternative 1: The Preferred Alternative

<input checked="" type="checkbox"/> Flat	<input type="checkbox"/> 1:50 – 1:20	<input type="checkbox"/> 1:20 – 1:15	<input type="checkbox"/> 1:15 – 1:10	<input type="checkbox"/> 1:10 – 1:7,5	<input type="checkbox"/> 1:7,5 – 1:5	<input type="checkbox"/> Steeper than 1:5
--	--------------------------------------	--------------------------------------	--------------------------------------	---------------------------------------	--------------------------------------	---

### Alternative 2

<input checked="" type="checkbox"/> Flat	<input type="checkbox"/> 1:50 – 1:20	<input type="checkbox"/> 1:20 – 1:15	<input type="checkbox"/> 1:15 – 1:10	<input type="checkbox"/> 1:10 – 1:7,5	<input type="checkbox"/> 1:7,5 – 1:5	<input type="checkbox"/> Steeper than 1:5
--	--------------------------------------	--------------------------------------	--------------------------------------	---------------------------------------	--------------------------------------	---

### Alternative S3 (if any):

<input type="checkbox"/> Flat	<input type="checkbox"/> 1:50 – 1:20	<input type="checkbox"/> 1:20 – 1:15	<input type="checkbox"/> 1:15 – 1:10	<input type="checkbox"/> 1:10 – 1:7,5	<input type="checkbox"/> 1:7,5 – 1:5	<input type="checkbox"/> Steeper than 1:5
-------------------------------	--------------------------------------	--------------------------------------	--------------------------------------	---------------------------------------	--------------------------------------	---

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

### Alternative 1 (The Preferred Alternative)

- 2.1 Ridgeline
- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- 2.5 Open valley
- 2.6 Plain
- 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront

### Alternative 2 (The Viable Alternative)

- 2.1 Ridgeline

- 2.2 Plateau
- 2.3 Side slope of hill/mountain
- 2.4 Closed valley
- √ 2.5 Open valley
- 2.6 Plain
- √ 2.7 Undulating plain / low hills
- 2.8 Dune
- 2.9 Seafront

### 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

The study area comprises rocks of the Letaba Formation, the Irrigasie Formation and shale of the Eccca Group. The soil is red to sometimes yellow, freely drained with a high base status, with a water holding capacity ranging between 61 and 100 mm. The study area is located on the Ae<sup>3</sup> Land Type.

The prominent river that occurs within the immediate study area is the Elands River. The banks of the river have some infestation with alien vegetation and in places the riparian vegetation has been removed for agricultural purposes, some places right up to the river margin.

Is the site(s) located on any of the following (tick the appropriate boxes)?

	Alternative 1 (Preferred Alternative)		Alternative 2		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES	NO	YES	NO	YES	NO
Dolomite, sinkhole or doline areas	YES	NO	YES	NO	YES	NO
Seasonally wet soils (often close to water bodies)	YES	NO	YES	NO	YES	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO	YES	NO
Dispersive soils (soils that dissolve in water)	YES	NO	YES	NO	YES	NO
Soils with high clay content (clay fraction more than 40%)	YES (at Elandsriver crossing)	NO	YES	NO	YES	NO
Any other unstable soil or geological feature	YES	NO	YES	NO	YES	NO
An area sensitive to erosion	YES	NO	YES	NO	YES	NO

<sup>3</sup> (A land type is a broad delineation of an area based on soil and topography. It is used in vegetation descriptions and classifications since there is normally a good correlation between the major vegetation types and Land Types (soil) and geology. The landtype gives a good idea of the soil type, depth and topography of an area for a vegetation/habitat study. It has no conservation implications.)



If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. (Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted).

#### 4. GROUNDCOVER & HABITAT

Indicate the types of groundcover present on the site:

The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Natural veld - good condition <sup>E</sup>	√ Natural veld with scattered aliens <sup>E</sup>	√ Natural veld with heavy alien infestation <sup>E</sup>	√ Veld dominated by alien species <sup>E</sup>	Gardens
Sport field	√ Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "E" is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

Ecological impact that occur mostly as a result of the construction of powerlines are impact on vegetation as well as on the avi-fauna (birdlife). Specialist studies had therefore been undertaken and are summarised as below.

##### 4.1 VEGETATION STUDY

In order to identify and describe ecological sensitive areas and to identify problem areas in need of special treatment or management, a field investigation was undertaken by Enviroguard Ecological Services CC. A specialist report on the Vegetation of the Affected Areas (Ecological Assessment) was compiled and is attached in Appendix D. A summary thereof follows.

##### General Ecological Description

The area is located mostly within the SVcb15 Springbokvlakte Thornveld (Mucina & Rutherford, 2006). This vegetation type is listed as an endangered vegetation type due to the area being used for agricultural activities (ploughing, grazing etc.). Currently only 1% of this vegetation type is statutorily conserved (Mucina & Rutherford, 2006). Unfortunately the largest sections of the study area is degraded due to agricultural and other human impacts (such as rural settlement, infrastructure; etc.) with a number of declared alien invasive species present throughout the entire site. The most dominant ecological component is the Elands River that will be crossed by the powerline. No ridges and significant koppies occur. The topography of the macro area can be described as relatively flat and undulating.

## Vegetation Units

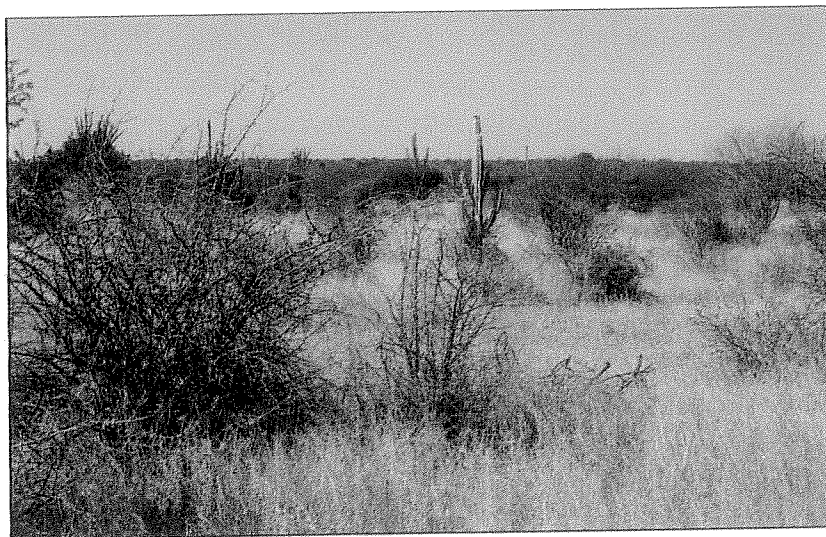
Five distinct vegetation units could be identified and are indicated in the figure below, namely:

1. *Dichrostachys cinerea*-*Terminalia sericea* woodland
2. *Combretum apiculatum*-*Peltophorum africanum* woodland
3. *Acacia tortilis* woodland
4. River vegetation
5. Agricultural lands



Vegetation units of the study area (Unit 1 = purple; Unit 2 = red; Unit 3 = orange; Unit 4 = blue; Unit 5 = green) (Google spot image 2010).

### Vegetation Unit 1 : *Dichrostachys Cinerea*-*Terminalia sericea* woodland

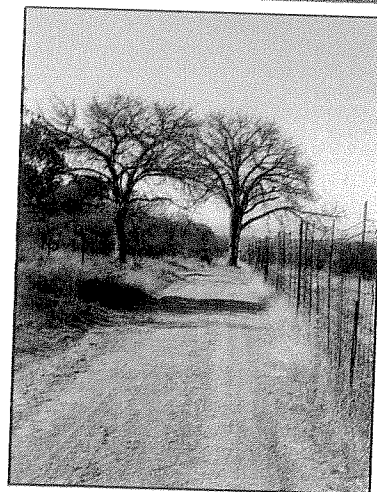


Mapping unit	1	Tree cover	10-20%
Soil	Red medium deep - loam	Shrub cover	15-55%
Topography	Mostly level (1-2°)	Herb cover	3%
Land use	Grazing	Grass cover	65-80%
Unit status	Dense degraded woodland	Rock cover	3-5%
Conservation priority	Low	Erosion	1%
Dominant spp.	<i>Dicrostachys cinerea</i> ; <i>Terminalia sericea</i> ; <i>Eragrostis rigidior</i> ; <i>Acacia tortilis</i> ; <i>Cereus jamacaru</i>		

The *Dicrostachys cinerea-Terminalia sericea* woodland represents a degraded version of the SVcb15 Springbokvlakte Thornveld (Mucina & Rutherford, 2006). This unit is representative, in species composition, of the natural vegetation, but is degraded due to previous overutilization resulting in indigenous invaders dominating the vegetation resulting in a degraded condition. Various declared alien invasive species are present throughout this area. The area is heavily utilised due to cattle grazing as well as wood harvesting. This has resulted in most of the tall trees been removed with mainly shrubs remaining. Overgrazing is evident from the dominance of the grass *Eragrostis rigidior* and the invasion of *Cereus jamacaru*. This vegetation unit is therefore from a plant ecological and ecosystem functioning point of view regarded as having a low-medium conservation value. This relatively dense woodland is found on terrain that is mostly level with low rock cover (3-5%). The soil is red and varies between sandy to loamy with a medium depth. The vegetation is dominated by the shrubs *Dicrostachys cinerea*, *Terminalia sericea* and the grass *Eragrostis rigidior*, together with the category 1 declared invader *Cereus jamacaru*. The woody *Acacia nilotica* and *Euclea undulata* are locally prominent. Other species present include the woody *Acacia nilotica*, *Boscia albitrunca*, *B foetida*, the grasses *Heteropogon contortus*, *Cynodon dactylon*, *Urochloa mosabicensis* and the forbs *Vernonia oligocephala*, and *Nidorella hottentotica*. The indigenous invader tree *Acacia mellifera* is also present. One variant of this unit occurs in the west namely the *Terminalia sericea* variant. This variant is found towards the west and is located next to a formal and informal housing area.

No red data species were found within this vegetation unit and it is doubted whether any such species will be present as a result of the degraded condition of the land.

#### Vegetation Unit 2 : *Combretum apiculatum-Peltophorum africanum* woodland



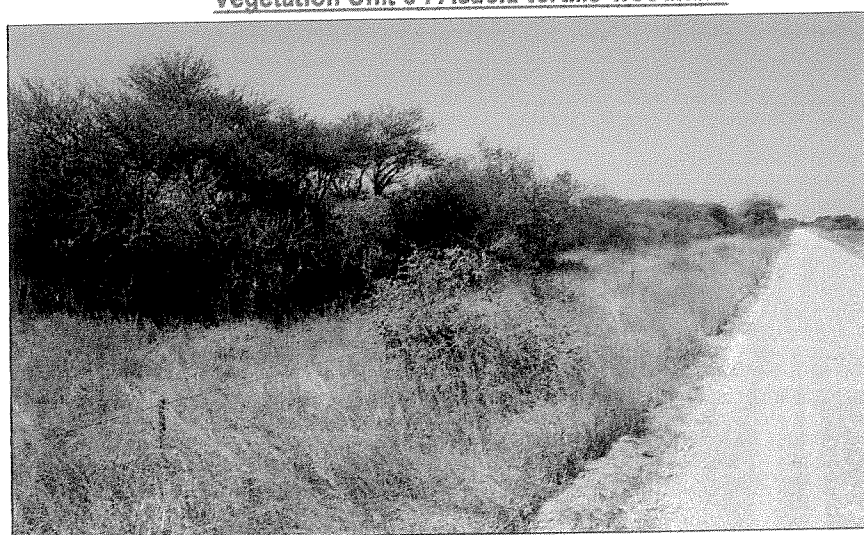
Mapping unit	2	Tree cover	5-30%
Soil	Red-yellow gravelly	Shrub cover	10-55%
Topography	Mostly level (1-2°)	Herb cover	5%
Land use	Grazing	Grass cover	40-60%
Unit status	Open to closed woodland	Rock cover	1%
Conservation priority	Medium	Erosion	1%
Dominant spp.	<i>Combretum apiculatum</i> ; <i>Peltophorum africanum</i> ; <i>Terminalia sericea</i> ; <i>Themeda triandra</i>		

The *Combretum apiculatum*-*Peltophorum africanum* woodland (vegetation unit 2), although slightly degraded with bush densification in some areas, is fairly natural and similar to the SVcb16 Western Sandy Bushveld (Mucina & Rutherford, 2006) which is not threatened. This vegetation unit has a medium species richness with various climax species with *Combretum apiculatum* dominant. In some areas similar the declared alien invasive species poses a threat to the natural ecosystem. The trees *Sclerocarya birrea* and *Spirostachys africanus* are present within this unit in the reserve in the west and should be protected against damage as far as possible. From a vegetation point of view the area has a medium conservation value and ecosystem functioning.

This vegetation unit is located on higher-lying shallow to medium deep gravelly granitic soil on game farms. Rock cover is low estimated at 5%. The vegetation is dominated by the trees *Combretum apiculatum* and *Peltophorum africanum* while the indigenous invasive tree *Terminalia sericea* is present in slightly lower-lying areas where the soil is deeper and more sandy. The dominant grass is *Themeda triandra*. Prominent species include the shrubs *Euclea undulata*, *Dichrostachys cineres* and the grasses *Eragrostis curvula*, *Tricholaenia monachne*, and the forbs *Waltheria indica*, *Indigofera comosa* and *Kohautia amatymbica*.

No red data species were found within this vegetation unit.

### Vegetation Unit 3 : *Acacia tortilis* woodland



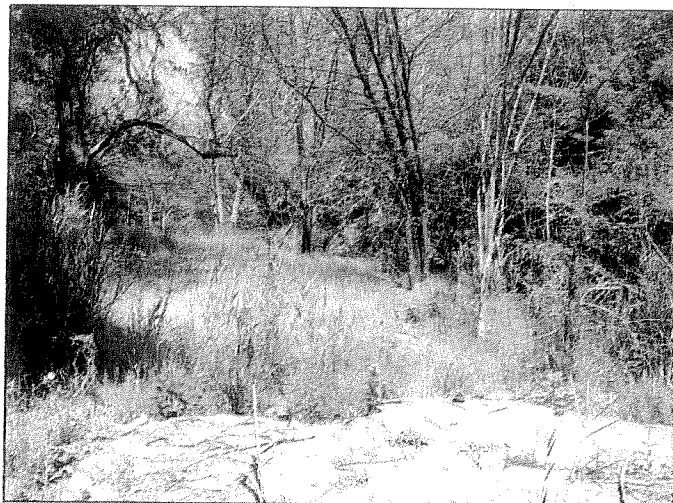
Mapping unit	3	Tree cover	5-30%
Soil	Red-yellow clayey	Shrub cover	10-55%
Topography	Mostly level (1-2°)	Herb cover	5%
Land use	Grazing	Grass cover	40-60%
Unit status	Open to closed woodland	Rock cover	1%
Conservation priority	Low	Erosion	1%
Dominant spp.	<i>Acacia tortilis</i> ; <i>Euclea undulata</i>		

The *Acacia tortilis* woodland (vegetation unit 3) is a degraded version of the SVcb15 Springbokvlakte Thornveld. The woody layer of this unit was most probably removed for grazing and/or agricultural purposes many years ago. This has resulted in the *Acacia tortilis* establishing very quickly once all other competition has been removed. The result is a low species richness and diversity. This unit is therefore regarded as having a low conservation value.

The *Acacia tortilis* woodland vegetation unit is located throughout the proposed route on game farms and open areas on red-yellow clayey soil. The vegetation is dominated by the tree *Acacia tortilis* the shrub *Euclea undulata* with the grasses *Themeda triandra*, *Cynodon dactylon* and *Eragrostis rigidior* locally prominent. The vegetation representative of this unit that are located within game farms has a higher species richness with a better grass and woody cover. The sections of this unit located on open / normal farm land are mostly encroached while some sections seem to have been affected due to bush clearing or previous agricultural activities. These activities have resulted in the increase of the *Acacia tortilis*, which is very invasive in old cleared agricultural and overgrazed fields, or have become encroached by the indigenous invader tree *Acacia mellifera* that has displaced the natural vegetation forming dense impenetrable thickets. The degraded condition of the vegetation is reflected in the species composition with 30% of the species being pioneer and 42% secondary successional species indicating previous disturbance. This unit has a low species richness.

No red data species were found within this vegetation unit and it is doubted whether any such species would be found due to the degraded condition of the unit.

#### Vegetation Unit 4 : River vegetation



Mapping unit	4	Tree cover	30-70%
Soil	Clayey	Shrub cover	15%
Topography	Stream	Herb cover	5%
Land use	None	Grass cover	10-20%
Unit status	Natural stream	Rock cover	8 %
Conservation priority	High	Erosion	3-10%
Dominant spp.	<i>Gleditsia triacanthos</i> ; <i>Combretum erythrophyllum</i> ; <i>Phragmites australis</i>		

**Vegetation unit 4 (River vegetation)** is typical of aquatic ecosystems. The species composition reflects the moist clayey soil conditions and is therefore dominated by species adapted to the wet environment. The River vegetation unit is heavily infested with alien plant species where the powerline will cross while being relatively natural in others parts (not affected by the proposed powerline) with a medium species richness. River systems are regarded as ecologically important due to their water-carrying capacities thereby supporting a number of ecosystems. Not only are these systems threatened due to human development and action, but they are fairly natural and representative of natural ecosystems in the area. This vegetation unit is therefore from an ecological and ecosystem functioning point of view regarded as having a high conservation value.

The vegetation of this river unit is dominated by the exotic declared invader tree *Gleditsia triacanthos* and the indigenous tree *Combretum erythrophyllum* with the grass *Phragmites australis* prominent. Other species present include the woody species *Gymnosporia buxifolia* (previously known as *Maytenus heterophylla*), *Searsia lancea* (previously known as *Rhus lancea*), the grasses *Cynodon dactylon*, *Paspalum dilatatum*, and the forbs *Tagetes minuta*, *Oenothera rosea* and *Amaranthus hybridus*. As expected in rivers and streams that are periodically flooded, various sections along the embankment area are degraded and eroded. These areas have a number of pioneer species such as *Tagetes minuta*, *Bidens pilosa*, *Sonchus oleraceus*, *Cynodon dactylon* and *Aristida congesta* present due to the bare ground and harsh environmental conditions prevailing. The exotic invasive tree *Gleditsia triacanthos* has become so dense in some areas that it has completely displaced all indigenous species with only some pioneer weedys species present in these areas. In other areas (at the Matlala Ramoshebo Township) the vegetation is more natural dominated by the tree *Combretum erythrophyllum*. No red data species were found within this vegetation unit.

## 5. Agricultural lands



Mapping unit	5	Tree cover	0%
Soil	Red loamy soil with high base status	Shrub cover	1%
Topography	Level	Herb cover	0-25%
Land use	Crops	Grass cover	n/a
Unit status	Agricultural land	Rock cover	0%
Conservation priority	Low	Erosion	0%
Dominant spp.	n/a		

**Vegetation unit 5 (Agricultural lands)** is actively and intensively farmed with various crops as well as irrigation schemes. The natural vegetation of these areas has been destroyed and the areas transformed from an ecological perspective. These areas are therefore from a plant ecological and ecosystem functioning point of view regarded as having a low conservation value.

Large sections of the study area comprise agricultural fields where various crops are planted. Some fields are left fallow as part of a rotation system and these are dominated by various pioneer weedy species such as *Conyza albida*, *Tagetes minuta* and *Aristida congesta*. Most areas are actively farmed and irrigated. As a result all natural vegetation has been displaced and the area transformed. Other areas are rested and comprise various pioneer weedy grasses and forbs. From an ecological point of view the area has no conservation value but from an agricultural and economic point of view these areas are extremely important.

No red data species were found within this vegetation unit though suitable habitat is present.

### Conclusion of Vegetation Study

- The Conservation of Agricultural Resources Act, 1983 (Act No 43) that regulates the control and/or eradication of alien and/or invasive species applies to the following
  - Vegetation Unit 1 : *Jacaranda mimosifolia*; *Melia azedarach*; *Cereus jamacaru*; *Opuntia ficus-Indica*
  - Vegetation Unit 2 : *Cereus jamacaru*; *Opuntia ficu-indica*
  - Vegetation Unit 3 : *Acacia mellifera*; *Melia azedarach*; *Cereus jamacaru*; *Opuntia ficus indica*
  - Vegetation Unit 4 : *Acacia mellifera*; *Gleditsia triacanthos*; *Morus alba*; *Argemone ochroleuca*; *Oenothera rosea*

- The Forest Act (Act 122 of 1984) that regulates the removal and or disturbance to of any protected species applies to the following :  
Vegetation Unit 2 : *Spirostachys africanus* (tambotie) and *Sclerocarrya birrea* (marula)
- The conservation status of the study area can be categorised along the proposed powerline route as follows:



Conservation status of the different vegetation units (Red = high; Dark yellow = medium; Yellow = Low) (From Google Spot Image 2010).

- No red data species were found in any of the vegetation units although vegetation units 1 and 2 are marginally suitable for one such species.
- Five medical plants had been identified throughout the study area. All of the species are however common and none is currently threatened. Care should however be taken that the protected *Sclerocarrya birrea* (marula) be left undisturbed as far as possible. If it has to be removed and/or pruned, the relevant permits have to be obtained - see above).
- The ecological impact related to the vegetation are
  - Loss of Flora & habitat
  - Loss of rare species
  - Loss of medicinal plants

The impact evaluation done by the ecologist concluded that none of the vegetation units systems are extremely sensitive in context with the proposed power line. Special mitigatory requirements are however applicable in Vegetation Units 2 and 4.



- It is not expected that any impact would occur on the ecology that could not be mitigated to acceptable levels. Both substation site alternatives are situated on areas with very low sensitivity. Any of the proposed alternatives (route and substation site) are viable from an ecological point of view. Note that the powerline route was determined on-site with the ecologist to ensure that no wetland areas or riparian vegetation will be affected.

## 4.2 BIRD IMPACT ASSESSMENT

The proposed 132kV powerline may impact on birdlife in the area and it was therefore required to undertake an assessment to investigate the extent of the risk. A Bird Impact Assessment was conducted by Chris van Rooyen Consulting and is attached in Appendix D. A summary thereof follows below.

### General description of the receiving environment

The study area falls primarily within the 2429CC and 2529AA. According to the Atlas of Southern African Bird, the natural habitat in these quarter degree grid cells (QDGC's) consists in 2429CC of 42% Arid Woodland and 58% Moist Woodland; in 2529 the composition is 100% Moist Woodland.

It is widely accepted that vegetation structure is more critical in determining bird habitat, than the actual plant species composition. The description of vegetation presented in this study therefore concentrates on factors relevant to the bird species present. The habitat that is relevant to the birds may also be broader than merely the vegetation type and structure and may include elements such as man-made infrastructure. The natural habitat has been extensively transformed in the study area, with agricultural fields replacing large portions of the original woodland.

Whilst some of the bird species recorded in the study area can be explained in terms of the above broad vegetation description, there are many differences in bird species distribution and density that correspond to differences in habitat at the micro level. These "bird micro-habitats" are evident at a much smaller spatial scale than the broader vegetation types or biomes.

### Micro-habitats

The following important bird micro-habitats are present within the study area:

#### Woodland

It is likely that many of the woodland associated species still occur in the immediate study area from time to time. Species generally associated with the savanna biome are large raptors, . It also forms the stronghold of Red Data species such as White-backed Vulture *Gyps africanus*, Cape Vulture *Gyps coprotheres*, Martial Eagle *Polemaetus bellicosus*, Tawny Eagle *Aquila rapax*, and Lappet-faced Vulture *Torgos tracheliotis*. Apart from Red Data species, it also serves as the stronghold of several non-Red Data raptor species, such as the Brown Snake Eagle *Circaetus cinereus*, Black-chested Snake Eagle *Circaetus pectoralis*, and a multitude of medium-sized raptors for example the migratory Steppe Buzzard *Buteo vulpinus*, African Harrier Hawk (Gymnogene) *Polyboroides typus*, Wahlberg's Eagle *Aquila wahlbergi* and African Hawk Eagle *Aquila spilogaster*. Apart from raptors, woodland in its undisturbed state is suitable for a wide range of other power line sensitive birds, including the Kori Bustard *Ardeotis kori*. Where woodland still occur in the study area, it is relatively intact, although quite fragmented by agricultural activity and urban development.

### *Agricultural fields*

The tilling of soil is one of the most drastic and irrevocable transformations brought on the environment. It completely destroys the structure and species composition of the natural vegetation, either temporarily or permanently. However, arable or cultivated land may represent a significant feeding area for many bird species in any landscape for the following reasons: through opening up the soil surface, land preparation makes many insects, seeds, bulbs and other food sources suddenly accessible to birds and other predators; the crop or pasture plants cultivated are often eaten themselves by birds, or attract insects which are in turn eaten by birds; during the dry season arable lands often represent the only green or attractive food sources in an otherwise dry landscape. The study area contains extensive areas of irrigated crops consisting of grapes, wheat, tobacco, maize, soya beans, citrus fruits, cotton and a variety of vegetables. **Generally speaking, agricultural areas are of lesser importance for the remaining Red Data species (mostly raptors) in the study area, as the agriculture is mostly intensive irrigation of monocultures, which is less suitable for them than the natural woodland.** Other large, non threatened powerline sensitive species such as White Stork *Ciconia ciconia*, Abdim's Stork *Ciconia abdimii*, and Spur-winged Goose *Plectropteris gabensis* also use freshly ploughed and irrigated lands to feed in.

### *Old lands*

Old lands reverting back to grassland habitat is not without importance for powerline sensitive **Red Data species – Secretary birds (Red Data status near threatened) often utilise open areas, e.g. old lands, between woodland for foraging and White-bellied Korhaan *Eupodotis senegalensis*, Lanner Falcon *Falco biarmicus* Pallid Harrier *Circus macrourus* and Lesser Kestrel *Falco naumanni* also frequently use old lands for foraging.** Non Red Data Black-chested Snake-eagle *Circaetus pectoralis* also often hunt in old lands.

### *Dams*

Whilst dams have altered flow patterns of streams and rivers, and affected many bird species detrimentally, a number of species have benefited from their construction. The construction of these dams has probably resulted in a range expansion for many water bird species that were formerly restricted to areas of higher rainfall. Man made impoundments, although artificial in nature, can be very important for variety of birds, particularly water birds. Apart from the water quality, the structure of the dam, and specifically the margins and the associated shoreline and vegetation, plays a big role in determining the species that will be attracted to the dam. Common species that could use dams and dam edges include Red-knobbed Coot *Fulica cristata*, Black-headed Heron *Ardea melanocephala*, African Darter *Anhinga rufa*, Blacksmith Lapwing *Vanellus armatus* and Egyptian Goose *Alopochen aegyptiaca*. **Red Data species recorded in the study area by SABAP1 that are likely to specifically be attracted to dams include Black Stork *Ciconia nigra*.**

### *Wetlands and drainage*

The prominent river that occurs within the immediate study area is the Elands River. The banks of the river has some infestation with alien vegetation, and perhaps more importantly, in places the riparian vegetation has been removed for agricultural purposes sometimes right up to the river margin. Rivers are extremely important sources of water for most bird species and will be regularly utilised not only as a source of drinking water and food, but also for bathing. It is clear that the Elands River in the study area has been impacted by human activity to some extent, especially agriculture, thus making it less desirable to birds that would, under more favourable conditions, utilise this river more extensively. Notwithstanding, it remains important for birds. The macro study area contains a few wetlands, which are mostly associated with the Elands River and its tributaries. **The Red Data species African Grass-**

Owl *Tyto capensis* and African Marsh Harrier *Circus ranivorus* which was recorded by SABAP1, typically roost and breed on the fringes of wetlands.

### Identifying a preferred alignment

The following factors were taken into account in order to determine the suitability of the Route Alternatives in terms of impacts on avifauna:

- *Wetlands and dams*: Wetlands and dams are always of particular importance for birds. The presence of wetlands and dams are an indicator of a higher collision risk, and in the case of wetlands, also a higher habitat destruction risk.
- *Rivers*: Drainage lines are important for water birds, many of which are collision sensitive. Drainage lines are therefore an indication of a higher collision risk, and sensitive riparian habitat also places it in a high risk habitat destruction category.
- *Transmission lines*: It is a proven fact that placing a new line next to an existing line reduces the risk of collisions to birds. The reasons for that are two-fold; it creates a more visible obstacle to birds and the resident birds, particularly breeding adults, are used to an obstacle in that geographic location and have learnt to avoid it. Other transmission lines running parallel to the proposed alignments were therefore treated as a risk reducing factor.
- *Roads*: These were taken as an indication of human activity and particularly vehicle and pedestrian traffic. It is assumed that the birds will avoid the immediate vicinity of roads due to the presence of traffic and pedestrians, and therefore it will reduce the risk of collision with lines running next to roads.
- *Towns*: Towns are obvious centres of human activity and are generally avoided by large powerline sensitive species. The presence of towns, settlements and industrial activity is therefore a risk reducing factor, both from a collision and a habitat destruction perspective.
- *Irrigated agricultural lands*: There is extensive agricultural activity in the study area. From a collision and habitat destruction perspective, this represents a risk reducing perspective as the natural woodland habitat has already been destroyed, resulting in few powerline sensitive Red Data using this habitat. Blue Cranes are potentially attracted to agricultural fields, but it is highly unlikely that the species will occur in the study area with any regularity.
- *Old lands*: This habitat may attract species such as the Secretary Bird and Lanner Falcon, as old lands are essentially artificial grassland patches, resembling natural clearings in woodland habitat. Old lands represent a higher collision risk.

The factors mentioned above were incorporated into a formula to arrive at a risk rating for the route alternatives as proposed (also refer to the Sensitivity Map attached in the Bird Impact Assessment Report). From this risk analysis both Route Alternatives can be supported.

### Conclusion of the Bird Impact Study

- The potential impacts of the new power line on avifauna are:
  - Electrocutation
  - Collision
  - Habitat destruction

#### Electrocutation

It is likely that Cape Vultures (and other species of vultures, specifically White-backed Vultures) could forage in the area, as the reporting rates for vultures are relatively high. There are large numbers of

livestock and game in the surrounding area, and should a carcass be available to the birds, they might attempt to roost on the poles. **The risk of phase-earth electrocution is therefore evaluated to be medium.** It should be mentioned that the pole design holds no inherent electrocution risk for other large solitary species such as eagles, as they almost never perch together in large numbers next to each other.

### **Collisions**

**There is a low collision threat that will be posed to Red Data species by the proposed power line.** Red Data species that could be impacted on through collision with the earth wire, and the likely locality of this impact, are as follows:

- Black Stork: Where the proposed alignments cross the Elands River, and at all larger dams.
- Secretarybird and Lanner Falcon: At fallow lands.
- White-backed Vulture and Cape Vulture: When congregating at any carcass which happens to be located within a few hundred metres of the line.

### **Habitat Destruction**

Both the sites of the proposed Moutse Substation is situated in degraded woodland see. Evidence of heavy grazing is evident in the depleted grass cover at the sites, and bush encroachment is also present. This habitat type is ubiquitous in the study area and transformation of 1 hectare (100 x 100m) to accommodate the new substation should not impact significantly on birds currently using this area. Due to the mobility of the larger species, they could conceivably move out of the immediate area and forage elsewhere in similar habitat. The species that are most likely to be affected by the loss of habitat are the smaller, common species that are currently resident in that hectare of vegetation. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the Moutse substation. **The risk of habitat destruction is therefore regarded as low.**

### **Preferred Alignment**

From an analysis of a range of potential risk factors, Alternative 1 emerged as the preferred alternative from a bird impact perspective.

### **Mitigation**

If all mitigation measures are in place, the construction of the proposed new 13km 132kV powerline can be supported out of an avifauna point of view. Mitigatory measures proposed to restrict electrocution and collision risk are :

- To restrict electrocution risk - All poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators, to reduce the chances of electrocution.
- To restrict collision risk - The spans that run parallel to and cross the Elands River should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white.
- To limit habitat destruction - Strict adherence to Eskom's standard EMP requirements for construction and maintenance of distribution power lines must take place and, if at all possible, the removal of large trees should be avoided.

## 5. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that does currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

The environment is mostly disturbed by agricultural activities. This includes ploughed fields and orchards, including irrigation channels and centre pivot sprayers. The only areas that seems less disturbed showing natural vegetation is where the game farms are or next to rivers, however even these seem to have been at least partially disturbed previously.

### √ 5.1 Natural area

- 5.2 Low density residential
- 5.3 Medium density residential
- 5.4 High density residential
- 5.5 Informal residential<sup>A</sup>
- 5.6 Retail commercial & warehousing
- 5.7 Light industrial
- 5.8 Medium industrial<sup>AN</sup>
- 5.9 Heavy industrial<sup>AN</sup>
- 5.10 Power station
- 5.11 Office/consulting room
- 5.12 Military or police base/station/compound
- 5.13 Spoil heap or slimes dam<sup>A</sup>
- 5.14 Quarry, sand or borrow pit

### √ 5.15 Dam or reservoir

- 5.16 Hospital/medical centre
- 5.17 School
- 5.18 Tertiary education facility
- 5.19 Church
- 5.20 Old age home
- 5.21 Sewage treatment plant<sup>A</sup>
- 5.22 Train station or shunting yard<sup>N</sup>
- 5.23 Railway line<sup>N</sup>
- 5.24 Major road (4 lanes or more)<sup>N</sup>
- 5.25 Airport<sup>N</sup>
- 5.26 Harbour
- 5.27 Sport facilities
- 5.28 Golf course
- 5.29 Polo fields
- 5.30 Filling station<sup>H</sup>
- 5.31 Landfill or waste treatment site
- 5.32 Plantation

### √ 5.33 Agriculture

### √ 5.34 River, stream or wetland

- 5.35 Nature conservation area
- 5.36 Mountain, koppie or ridge
- 5.37 Museum
- 5.38 Historical building
- 5.39 Protected Area

- 5.40 Graveyard
- 5.41 Archaeological site
- 5.42 Other land uses (describe)

If any of the boxes marked with an "N" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

The powerline will not cross any railway lines, major roads or airports.

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

The powerline will not cross any industrial areas.

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity?

If YES, specify and explain:

If YES, specify:

The powerline will not cross any filling stations

## 6. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including

Archaeological or palaeontological sites, on or close (within 20m) to the site?

YES

NO

Uncertain

If YES, explain:

Please see below

If uncertain, conduct a specialist investigation by a recognised specialist in the field to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist:

A Phase 1 Heritage Impact Assessment was undertaken by Archaeos Culture & Cultural Resource Consultants (attached in Appendix D) and is summarised below.

Dr Van Vollenhoven confirmed that the study area is relatively flat which would have made it unattractive for human settlement in the past, especially during pre-historic times, as no shelter exists. It was most probably utilised for grazing since the abundance of grazing and water would have lured people the area. The finding of chance archaeological discoveries will therefore most likely be stone tools and potsherds out of context, and possible isolated graves.

**Conclusion and recommendation**

It was concluded that the HIA was conducted successfully and that no sites of cultural or archaeological significance were identified. Both alternatives could be supported from a heritage point of view.

It is however a requirement that contractors be made aware that the subterranean presence of archaeological and/or historical features or artefacts are always a distinct possibility. Care should be taken when development work commences, that if any these are accidentally discovered a qualified archaeologist be called in to investigate.

Will any building or structure older than 60 years be affected in any way?

YES	NO
-----	----

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

YES	NO
-----	----

If yes, please submit or, make sure that the applicant or a specialist submits the necessary application to SAHRA or the relevant provincial heritage agency and attach proof thereof to this application if such application has been made.

## SECTION C: PUBLIC PARTICIPATION

### 1. ADVERTISEMENT

The person conducting a public participation process must take into account any guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of the application which is subjected to public participation by—

- (a) fixing a notice board (of a size at least 60cm by 42cm; and must display the required information in lettering and in a format as may be determined by the competent authority) at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- (b) giving written notice to—
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority;
- (c) placing an advertisement in—
  - (i) one local newspaper; or
  - (ii) any official *Gazette* that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
- (d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may have an impact that extends beyond the boundaries of the metropolitan or local municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official *Gazette* referred to in subregulation 54(c)(ii); and
- (e) using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desiring of but unable to participate in the process due to—
  - (i) illiteracy;
  - (ii) disability; or
  - (iii) any other disadvantage.

### 2. CONTENT OF ADVERTISEMENTS AND NOTICES

A notice board, advertisement or notices must:

- (a) indicate the details of the application which is subjected to public participation; and
- (b) state—
  - (i) that the application has been submitted to the competent authority in terms of these Regulations, as the case may be;
  - (ii) whether basic assessment or scoping procedures are being applied to the application, in the case of an application for environmental authorisation;
  - (iii) the nature and location of the activity to which the application relates;



- (iv) where further information on the application or activity can be obtained; and
- (iv) the manner in which and the person to whom representations in respect of the application may be made.

### **3. PLACEMENT OF ADVERTISEMENTS AND NOTICES**

Where the proposed activity may have impacts that extend beyond the municipal area where it is located, a notice must be placed in at least one provincial newspaper or national newspaper, indicating that an application will be submitted to the competent authority in terms of these regulations, the nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations in respect of the application can be made, unless a notice has been placed in any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of the EIA regulations.

Advertisements and notices must make provision for all alternatives.

### **4. DETERMINATION OF APPROPRIATE MEASURES**

The practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees, ratepayers associations and traditional authorities where appropriate. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

### **5. COMMENTS AND RESPONSE REPORT**

The practitioner must record all comments and respond to each comment of the public before the application is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to this application. The comments and response report must be attached under Appendix E.

### **6. AUTHORITY PARTICIPATION**

Please note that a complete list of all organs of state and or any other applicable authority with their contact details must be appended to the basic assessment report or scoping report, whichever is applicable.

Authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input.

List of authorities informed:

- Department of Water Affairs
- Department of Agriculture Mpumalanga
- National Department of Agriculture, Conservation and Fisheries
- Department of Public Works, Roads and Transport
- Department of Minerals and Energy
- Mpumalanga Parks Board
- South African Heritage Resources Agency
- Sekhukhune District Municipality
- Groblersdal Local Municipality
- Ephraim Mogale Local Municipality: Town Planning Division
- Ephraim Mogale Local Municipality: Environmental Services
- Ward Councillors
- Tribal Council, Zamenkomst

List of authorities from whom comments have been received:

**SAHRA – Archaeology, Palaeontology and Meteorite Unite: Mr Philip Hine**

A Heritage Impact Assessment must be undertaken which must include the archaeological component and any other applicable heritage components. Appropriate mitigation, which may involve recording, sampling and dating sites that are to be destroyed, must be done as and if required.

*Response*

*A Phase 1 Heritage Impact Assessment was undertaken by Archaetnos Culture & Cultural Resource Consultants (attached in Appendix D). This study concluded that no sites of cultural or archaeological significance were identified. No paleontological study is relevant and/or required for this site.*

## 7. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for linear activities, or where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that subregulation to the extent and in the manner as may be agreed to by the competent authority. Proof of any such agreement must be provided, where applicable.

Has any comment been received from stakeholders?

YES	NO
-----	----

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Detail of the Public Participation Process followed with comment received and responses thereto are supplied in Appendix E of this report.

Communication could be grouped as follows :

- Comment received after the distribution of the First Phase Notification Letter
- Written comment received during the Open Day (held on 2 March 2011)
- Communication during the meeting held with the local community on Zamenkomst
- Communication with directly affected landowners after the Open Day

Comment are mostly related to the following :

- Potential disturbance to agricultural activities
- Potential disturbance to and destruction of natural vegetation
- Potential disturbance to game such as giraffes and sable antelope on game farms
- Potential interference with a landing strip on the Farm Tambotielaaagte
- Security and safety risk in terms of access and control during construction and maintenance
- Debushing requirements
- Servitude width
- Communication with Eskom during the construction and operational periods
- Impact on land values

Note :

A copy of this Basic Assessment Report had been forwarded to the following authorities for their final comment :

- South African Heritage Resources Agency, Cape Town
- Ephraim Mogale Local Municipality: Environmental Services
- The Department of Water Affairs (the Mpumalanga Regional Office in Bronkhorstpruit)
- The EIA Admin Office, Limpopo Province Department of Finance and Economic Development

All final comment received will be addressed and included in the Final Basic Assessment Report to be submitted to the Department of Environment Affairs for consideration.

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

### 1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

List the main issues raised by interested and affected parties.

The main issues raised during the public participation process are as follows:

1. SAHRA requested that a Heritage Impact Assessment should be undertaken.
2. The powerline should not impact on irrigation systems and other building structures of affected landowners. Potential disturbance to agricultural activities must be restricted or prevented.
3. Potential disturbance to and destruction of natural vegetation
4. Potential disturbance to game such as giraffes and sable antelope on game farms must be prevented.
5. Potential interference with a landing strip on the Farm Tambotielaagte must be prevented.
6. Security and safety risk measures in terms of access and control during construction and maintenance must be identified and implemented.
7. Debushing requirements must be specified.
8. Servitude widths should be the minimum required.
9. Communication channels with Eskom during the construction and operational periods must be identified.
10. Impact on land values must be considered (especially during compensation).

Response from the practitioner to the issues raised by the interested and affected parties (A full response must be given in the Comments and Response Report that must be attached to this report as Annexure E):

- A Phase 1 Heritage Impact Assessment was undertaken by Archaeos Culture & Cultural Resource Consultants (attached in Appendix D). This study concluded that no sites of cultural or archaeological significance were identified.
- The final recommended route was identified ensuring the following :
  - 1) Minimal and no impact on irrigation systems or any other structures and agricultural activities will occur. Specific detail on site will be clarified during the negotiation period.
  - 2) Impact on natural habitat will be minimised. The route follows as far as possible existing infrastructure such as farm roads and game fences, mostly along disturbed land.
  - 3) No wetland areas will be crossed.
  - 4) No game will be affected.
  - 5) The shortest viable route, ensuring the least impact on the environment.
  - 6) No interference with landing strips.
- The Environmental Plan provides clear and strict mitigatory measures in terms of
  - 1) safety and control of labourers during the construction and operational phases (maintenance phase)

- 2) Debushing specifications
- 3) Communication channels with Eskom during construction and maintenance phases.
- The negotiator who will liaise on behalf of Eskom with the directly affected landowners will communicate the minimum servitude widths requirements with the landowners and will manage the compensation of the servitude (in personal liaison with the landowners and independent evaluators).

## 2. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

List the potential direct, indirect and cumulative property/activity/design/technology/operational alternative related impacts (as appropriate) that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed.

### ALTERNATIVE 1 (PREFERRED ROUTE ALTERNATIVE) and ALTERNATIVE 2 (VIALE ALTERNATIVE)

Please note:

Alternative 1 (Preferred Route) and Alternative 2 (Viable Alternative Route) run along the same road for 95% of the route. The portion where the alternative applies is situated to the far western end of the route at the proposed Moutse Substation Site (with two substation site alternatives) where the area has the almost exact characteristics (vacant over-grazed rural land with a flat topography). The impact for both of these alternatives will therefore be the same. In order to streamline the report, the section is therefore not duplicated for both alternatives.

#### PLANNING AND DESIGN PHASE

<i>Direct Impacts</i>	<i>Mitigation</i>
<p><b>Impact on the natural habitat</b>  <i>Powerline route</i>            The vegetation within the study area varies from poor to good (low to high conservation value) and proper planning is required in order to minimise negative impacts that the powerline structures could have on the surrounding ecosystems.</p> <p>Although the new 132kV line will mostly follow existing roads and fences, it will transverse some ecological sensitive areas (the Elands River – high sensitivity) as well as portions situated within the woodland vegetation units (medium sensitivity) and the impact may be severe if</p>	<p><b>Mitigation - natural habitat</b>            The mitigation measures for the <u>planning phase</u> would prevent unnecessary destruction of natural ecosystems, thereby ensuring that the proposed development is ecologically sensitive:</p> <ul style="list-style-type: none"> <li>• The route has been determined to restrict impact on the environment – it runs mostly along farm boundaries, roads and fences.</li> <li>• Allowance must be made in the working and financial planning programmes for the following:               <ol style="list-style-type: none"> <li>1) The Conservation of Agricultural Resources Act, 1983 (Act No 43) that regulates the control and/or eradication of alien and/or invasive species applies to the following</li> </ol> </li> </ul>

proper mitigation measures are not being followed. (Impact on the Elands River is described below). Mitigation measures would minimise most of the expected impacts and lessen the effect on the environment.

The development will not have a negative impact on the larger region with regard to plants, plant communities and water courses when considering it in a regional perspective.

Vegetation Unit 1 : *Jacaranda mimosifolia*; *Melia azedarach*; *Cereus jamacaru*; *Opuntia ficus-Indica*

Vegetation Unit 2 : *Cereus jamacaru*; *Opuntia ficu-indica*

Vegetation Unit 3 : *Acacia mellifera*; *Melia azedarach*; *Cereus jamacaru*; *Opuntia ficus indica*

Vegetation Unit 4 : *Acacia mellifera*; *Gleditsia triacanthos*; *Morus alba*; *Argemone ochroleuca*; *Oenothera rosea*

2) The Forest Act (Act 122 of 1984) that regulates the removal and or disturbance to of any protected species applies to the following:

Vegetation Unit 2 : *Spirostachys africanus* (*tamboetie*) and *Sclerocarrya birrea* (*marula*)

- Once the final route is pegged, the ecologist (Dr Brown) should accompany the engineers and surveyor before construction commences to ensure that no structures are placed within any sensitive environmental features. This is also stipulated in the EMP.

### Impact – Water Resources

Improper planning of the position of the powerline structures may have a severe impact on rivers, streams and wetlands.

If placement of pylons is planned in an insensitive manner, damage could be done to structures during flood periods resulting in power failures and unplanned veld fires that damage the environment.

Riparian vegetation is important for the health of the river and destruction thereof should be avoided.

During construction periods concrete and oil spills may pollute water bodies.

Labourers could also cause pollution of the water bodies and damage to the riparian areas during the construction and maintenance phases if they are not managed in a responsible manner. (This issue will be addressed below)

### Mitigation – Water Resources

- The route had been determined with the ecologist on site, ensuring that no wetland areas are affected by the proposed powerline.
- The engineer for the project should ensure that structures are not placed outside the 1:100 year floodline of any river or stream as well as the riparian vegetation area (whichever is the largest). Should this not be possible, it will be required to apply for a Water Use License in terms of the National Water Act (Act No 36 of 1998) with the Department of Water Affairs.

The contractor must be made aware of the following prior to commencement of construction :

- Extra care is to be taken not to impact on riverine vegetation in any way, and the unnecessary removal of large trees are not allowed (see also in this respect the Procedure for Vegetation Clearance and Maintenance within ESKOM owned land, EPC 32-247).
- Any known or discovered spillage of toxic substances into a stream or river should be followed by immediate monitoring of the receiving streams and rivers.
- Streams, rivers and dams must be protected

	<p>from direct or indirect spillage of pollutants such as refuse, garbage, cement, concrete, sewage, chemicals, fuels, oils, aggregate, wash water, organic materials and bituminous products.</p>
--	--

<p><b>Impact on birds</b></p> <p><i>Collision</i>  There is a <b>LOW</b> collision threat that will be posed to Red Data species by the proposed power line. Red Data species that could be impacted on through collision with the earth wire, and the likely locality of this impact, are as follows:</p> <ul style="list-style-type: none"> <li>• Black Stork: Where the proposed alignments cross the Elands River, and at all larger dams.</li> <li>• Secretary Bird and Lanner Falcon: At fallow lands.</li> <li>• White-backed Vulture and Cape Vulture: When congregating at any carcass which happens to be located within a few hundred metres of the line.</li> </ul> <p><i>Electrocution</i>  It is likely that Cape Vultures (and other species of vultures, specifically White-backed Vultures) could forage in the area, as the reporting rates for vultures are relatively high. There are large numbers of livestock and game in the surrounding area, and should a carcass be available to the birds, they might attempt to roost on the poles. The risk of phase-earth electrocution is therefore evaluated to be <b>MEDIUM</b>. It should be mentioned that the pole design holds no inherent electrocution risk for other large <b>solitary</b> species such as eagles, as they almost never perch together in large numbers next to each other.</p> <p><i>Habitat destruction</i>  Provided that large trees are not removed, the clearing of woodland under the new line will not have a huge impact, especially in view of the already extensive impact that intensive agriculture and urbanisation have had on the vegetation layer in large parts of the study area. Furthermore, the clearing of the woodland coupled with the provision of perching space as</p>	<p><b>Mitigation – Birds</b></p> <p><i>The project engineers (planning and design) for the design, construction programme, budgeting must be aware of the following :</i></p> <p><i>Mitigation for collision</i>  The spans that run parallel to and cross the Elands River should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white.</p> <p><i>Mitigation for electrocution</i>  All poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators, to reduce the chances of electrocution.</p> <p><i>Mitigation for habitat destruction</i>  No specific recommendations are put forward as far as the potential avifaunal impacts are concerned, other than strict adherence to Eskom's standard EMP requirements for construction and maintenance of distribution power lines. However, if at all possible, the removal of large trees should be avoided.</p>
---	--

a result of the electricity poles, might even draw in raptors. The impact on smaller, non-Red Data species that are potentially breeding in the area that will be cleared for the new power line will be local in extent, in that it should not affect regional or national populations in any significant way. The risk of habitat destruction is therefore regarded as **LOW**.

Both the sites of the proposed Moutse Substation are situated in degraded woodland. Evidence of heavy grazing is evident in the depleted grass cover at the sites, and bush encroachment is also present. This habitat type is ubiquitous in the study area and transformation of 1 hectare (150 x 100m) to accommodate the new substation should not impact significantly on birds currently using this area. Due to the mobility of the larger species, they could conceivably move out of the immediate area and forage elsewhere in similar habitat. The species that are most likely to be affected by the loss of habitat are the smaller, common species that are currently resident in that 1,5 hectare of vegetation. It is not envisaged that any Red Data species will be displaced by the habitat transformation that will take place as a result of the construction of the Moutse substation.

**Impact on cultural heritage resources**

The HIA undertaken for this project revealed no sites of cultural or archaeological significance.

**Mitigating the heritage resources**

There are no No-Go areas within the powerline corridor. However, areas with natural vegetation have a high possibility of covering archaeological sites. This should be kept in mind during detail planning of the route.

Contractors must be made aware that the subterranean presence of archaeological and/or historical features or artefacts is always a distinct possibility.

It is a general requirement that should any heritage artefacts and/or graves be found during the construction period, it would be required to halt construction in that area immediately and involve the South African Heritage Resources Agency to advise on further action in that regard.



### Social Impact

The construction of new powerlines could impact on land owners if not planned and designed to accommodate the needs of the land owners.

The possibility also exists that residents other than land owners might be impacted upon by the new lines. Land users or lands rights holders could farm on the portion of land affected by the proposed line or rent a house and not own it. The construction activities could for instance damage the crops of the land user.

The compensation for the servitude is always paid to the landowner and not to the land user.

Any possible impact on land owners as well as land users should be identified and accommodated before construction of the route commences.

### Mitigation – Social Impact

- In order to identify all possible social issues a thorough Public Participation Programme was undertaken as per the NEMA Regulations. It is important to note that Eskom negotiators also contacted each affected landowner personally in order to discuss the possibility of running the powerline across their land. All identified issues are stipulated in the Comments and Responses Report and site specific and general mitigation measures are provided in the Environmental Management Plan.
- Furthermore, all I&AP's will be provided with the opportunity to peruse this Basic Assessment Report for further comment and/or to ensure that their concerns were satisfactorily addressed.
- The lands rights holder that might farm on the land, but is not the owner thereof should not be impacted upon during the operation of the new proposed powerline. According to Eskom Lands and Rights the normal procedure is as follows: The Environmental Impact Assessment has to be completed with a recommendation regarding the final route before the process of negotiations can be started. A registered land valuator will determine the value of the property to be affected by the powerline. A process of negotiations will follow between Eskom and landowners as well as lands rights holders. Both the landowner as well as the lands rights holder should give Eskom permission for the option to require a servitude. A servitude is then registered which provides Eskom with the rights to construct and maintain the powerline over the applicable property. Payment for the servitude will be made to the landowner. The land rights holder will be compensated in the case of any damage to his farming activities during the construction of the line.

With all mitigation measures in place, it is anticipated that the social impact of the powerline will be minimal.

<b>Indirect impacts</b>	<b>Mitigation</b>
<p><b>Visual impact</b> The visual impact of powerlines can be substantial in a more rural environment and factors to consider are the following:</p> <ul style="list-style-type: none"> <li>• The ability of the surrounding environment to absorb the visual impact of the powerline.</li> <li>• The structures to be used for the powerline.</li> </ul> <p>The following is relevant for this project:</p> <ul style="list-style-type: none"> <li>• The entire powerline route falls within a macro area that is characterised by a flat topography, farm boundaries, roads, fences, agricultural activities and farm houses. It is not in a pristine state anymore. It does however have a pleasant rural country feel and care must be taken to prevent unnecessary visual impact, specifically along the game farms that are also dependant on the tourism sector.</li> </ul>	<p><b>Mitigation for Visual Impact</b> The visual impact is mitigated to an extent by</p> <ul style="list-style-type: none"> <li>• the use of monopole steel structures</li> <li>• the placement of the route along existing infrastructure – the route does not cross farms randomly in all directions.</li> </ul> <p>A visual of the structures is included in Appendix B of this report.</p>

<b>Cumulative impacts</b>	<b>Mitigation</b>
<p><b>Impact of improper planning</b> Insufficient planning before construction commence can have far reaching implications on</p> <ul style="list-style-type: none"> <li>- Eskom (i.e. financial implications of improper forecasts of demand, unreliable and insufficient power supply to existing users, etc.);</li> <li>- Eskom users (i.e. voltage dips, power cuts, non-availability of power to new users, etc.);</li> <li>- Affected landowners (i.e. a route which may be the most cost effective / logical to Eskom may have a negative effect on the landowners and they may not allow Eskom lines to transverse their property);</li> <li>- The natural environment (i.e. destruction of natural habitat, pollution of water resources, etc.).</li> </ul>	<p><b>Mitigation for improper planning</b> A proper planning procedure should be followed in order to ensure that the project as proposed takes into consideration the needs of all affected parties.</p> <p>The final project design should underline the principles as advocated by the term 'triple bottom line' (people, planet, profit), and should be measured against the triple bottom line goals of economic, social and ecological integration and sustainability.</p>

## CONSTRUCTION PHASE

<i>Direct Impacts</i>	<i>Mitigation</i>
<p><b>Impact on natural habitat</b> This impact is associated with disturbance to and/or destruction of the flora component.</p> <p>During construction the project could cause a significant impact where insensitive clearing for construction and access purposes, etc. is required. Insensitive clearing can cause the destruction of habitat. Not only does vegetation removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. Insensitive vegetation clearance can also cause erosion.</p> <p>Pressure on the natural environment could occur as a result of an influx of labourers into the area that may involve the collection of firewood and medicinal plants, as well as uncontrolled veld fires.</p> <p>The following issues should however be considered :</p> <ul style="list-style-type: none"> <li>• No clearing of veld is necessary under the powerline except for large trees.</li> <li>• Only a small workforce would work on the site at any given time.</li> <li>• No firebreaks are necessary under the powerline.</li> <li>• In the case of an aboveground powerline only the specific site where the structure for the line is placed will be impacted upon.</li> </ul>	<p><b>Mitigation for impact on natural habitat</b></p> <ul style="list-style-type: none"> <li>• No fires may be made for the burning of vegetation and waste.</li> <li>• Fire fighting equipment must be readily available on site during welding and cutting operations.</li> <li>• Branches and other debris resulting from pruning processes should not be left below conductors or in areas where it will pose a risk to infrastructure.</li> <li>• Debris shall not be burnt under any circumstances</li> <li>• Fires shall not be made for the purpose of chasing or disturbing fauna.</li> <li>• Care must be taken to ensure alien vegetation is not spread as a result of vegetation management processes through the transport of seeds or other vegetative material from one site to another.</li> <li>• The procedures for vegetation clearance and maintenance within overhead powerline servitudes and on Eskom owned land as prescribed by Eskom must be implemented. Selective bush clearing must take place, i.e. indigenous vegetation which does not interfere with the safe operation of the structure should be left undisturbed.</li> <li>• Eskom must identify and demarcate the exact clearing to the contractor to ensure that the minimum debushing takes place.</li> <li>• The herbaceous layer underneath powerlines may be mowed or slashed not lower than 2.5cm above ground level. No ploughing or removal of any natural species must be allowed.</li> <li>• Any medicinal plants encountered must be carefully removed under supervision of a qualified ecologist and replanted within the same ecosystem.</li> <li>• Where clearing for access roads is essential, the maximum width to be cleared is 4m. Clearing for tower positions must be the minimum required for the specific tower.</li> <li>• Alien vegetation in servitudes shall be managed in terms of the Regulation GNR.1048</li> </ul>

	<p>of 25 May 1984 (as amended) issued in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983. In terms of these regulations, Eskom shall "control" i.e. to combat category 1, 2 and 3 plants to the extent necessary to prevent or to contain the occurrence, establishment, growth, multiplication, propagation, regeneration and spreading such plants within servitude areas or land owned by Eskom. Due to the nature of alien vegetation, a control programme for alien vegetation control must be implemented. The implementation thereof could be more frequent than the three year interval recommended for indigenous vegetation. Alien vegetation can grow at rates significantly faster than 1 meter per year.</p> <ul style="list-style-type: none"> <li>• The use of herbicides shall be in compliance with the terms and conditions of The Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act 36 of 1947).</li> <li>• No animals or birds may be fed, disturbed, hunted or trapped.</li> <li>• Special care must be taken to limit all vehicular traffic.</li> <li>• Re-vegetation of exposed or affected soils must be carried out immediately upon termination of construction activities in a given area.</li> <li>• A strict management plan must be in place before construction can commence to ensure that the structures are not placed in environmentally sensitive areas.</li> <li>• It is recommended that specialists inspect the final corridor for the proposed powerline and that once the final positions of the structures are determined, a final inspection must be undertaken.</li> </ul>
<p><b>Impact on Birds</b> The possible impacts of the proposed construction of the powerline on birds are the following:</p> <ul style="list-style-type: none"> <li>• Disturbance as a result of the construction activities and the effect that this activity could have on bird species residing in the area, particularly whilst breeding.</li> <li>• Loss of breeding, foraging and roosting habitat through habitat transformation as a result of the construction in the servitude area.</li> </ul>	<p><b>Mitigation for impact on birds</b> Mitigation measures as proposed in the Planning and Design Phase should be followed as well as the mitigation measures as proposed under the heading "Mitigation for the Impact on Natural Habitat".</p>

### **Impact on Water Resources**

Groundwater and surface water:

Hazardous materials and construction equipment will be stored at site camps and used on site. Significant amounts of transformer oils are utilised in the operation of a substation. The pollution of groundwater may result from spillages that may occur. In addition, the campsite may accommodate construction workers, in which case solid and liquid effluents would be produced, including sewage and domestic solid waste. Therefore petrol, oil and lubricant spills are the main concern in respect of water pollution during construction together with organic pollution caused by inadequately managed facilities at site camps and at the work sites.

The use of water for construction purposes will put pressure on water resources. In most cases, abstraction of water for construction purposes will require a permit from DWA unless pre-existing rights are purchased from farmers. For this project no water however will be taken from any water course for construction – water tanks will be used.

The proposed powerline will cross some drainage lines, depressions, streams and rivers. During construction the destruction of these can have a negative impact on sensitive ecosystems.

### **Mitigation for Impact on Water Resources**

#### Construction camp

- Encourage the construction contractor to employ local people as far as is reasonably practical and encourage the contractor to transport them daily to and from site. This would reduce solid and liquid waste production and water demand at the site camps.
- In all cases, abstraction of water for construction purposes will require a permit from the Department of Water Affairs unless pre-existing rights are purchased from farmers. For this project, water tanks will be used during construction.

#### Diesel, hydraulic fluid and lubricants

- Minimise on-site storage of petroleum products.
- Bund storage tanks to 120% of capacity.
- Should any transfer of vehicle fuel takes place on site, it is important to demarcate a specific area for this purpose. This area should be covered with an impermeable layer to prevent any penetration of fuel and oil spillage into the soil. All petrochemical leaks and spills must be appropriately contained and disposed of at a licensed waste disposal site.
- All construction vehicles should be serviced on a regular basis to minimise the risk of oil spillage on site. Servicing of vehicles to be in designated areas with appropriate spill management procedures in place;
- When not in use, construction vehicles must be parked in an area provided with an impermeable layer to prevent leaks and spills from penetrating the substrate.
- Ensure measures to contain spills readily available on site (spill kits).
- Ensure proper maintenance procedures in place for vehicles and equipment.

#### Site camp domestic waste (kitchens, showers)

- Deposit solid waste in containers and dispose at municipal waste disposal sites regularly. Proof to be kept by contractor.
- Dispose of liquid waste (grey water) with sewerage.

	<p><u>Site camp sewage</u></p> <ul style="list-style-type: none"> <li>• Minimise on-site accommodation</li> <li>• Supply, maintain and enforce the use of mobile toilets at the work sites.</li> <li>• Install appropriate facilities at the campsites. Preferably utilise municipal systems (conservancy tanks with periodic removal) or chemical toilets.</li> </ul> <p><u>Site camp inert waste (waste concrete, reinforcing rods, waste bags, wire, timber, etc.)</u></p> <ul style="list-style-type: none"> <li>• Ensure compliance with stringent daily clean up requirements on site.</li> <li>• Dispose at municipal waste disposal sites.</li> </ul>
--	---

<p><b>Impact of erosion</b> The construction of service roads and maintenance activities associated with a powerline can lead to erosion.</p>	<p><b>Mitigation for Impact of erosion</b></p> <ul style="list-style-type: none"> <li>• Vehicle traffic should be limited and existing access routes should be used where possible.</li> <li>• All construction roads (if any) should be rehabilitated.</li> <li>• Excavation of foundations for pylons, movement of vehicles and people and the run-off from cleared areas can cause erosion. If possible, construction must be limited to the drier periods and vehicle traffic should be kept to a minimum on the construction routes.</li> <li>• Only selective vegetation clearing will be necessary.</li> <li>• Indigenous vegetation which does not interfere with the safe operation of the powerline should be left undisturbed.</li> <li>• All cleared areas must be ripped and rehabilitated after construction. The top 200mm layer of topsoil must be removed and stockpiled in heaps not higher than 2m and replaced on the construction areas once the activities have been completed. The affected areas should be replanted with a grass mixture indigenous to the area.</li> <li>• Pro-active measures must be implemented to curb erosion and to rehabilitate eroded areas. All areas susceptible to erosion must be installed with temporary and permanent diversion channels and berms to prevent concentration of surface water and scouring of slopes and banks, thereby countering soil</li> </ul>
---	--

	<p>erosion.</p> <ul style="list-style-type: none"> <li>• It is suggested that containment dams or berms are constructed around transformers.</li> <li>• It is not proposed to establish new additional permanent roads; however, should new temporary access be required, then Eskom must liaise with the individual landowner directly in terms of the preferred route and rehabilitation measures required after construction had been completed. The existing tracks will be used as far as possible and rehabilitation where necessary will take place. Measures in this regard are supplied in the EMP and in the contract of contractors.</li> </ul> <p>Should any new temporary access roads be required, the following should apply in areas which are prone to erosion:</p> <ul style="list-style-type: none"> <li>• Where a cutting is made, subsoil drains should be installed wherever a perched water table occurs within 900m of the formation in all cuttings and below fills in the alluvial zones.</li> <li>• It is further critical to manage surface water. Drains should be provided along the top and bottom of all deep cuttings. This is to minimise the flow of surface water and erosion to the exposed cut faces and erosion along the toe of the cuttings.</li> <li>• Steep sections of the service road must be supplied of sufficient drainage areas to reduce flow velocity of run-off water.</li> <li>• Any eroded sections must be rehabilitated and part of the management plan must include regular inspections of the water run-off areas.</li> <li>• If any erosion occurs, rehabilitation must be implemented.</li> </ul>
--	--

<p><b>Impact of labourers</b></p> <p>An uncontrolled influx of labourers with associated squatter and increased crime problems creates pressure on the natural environment (placement of snares, removal of trees for firewood, careless waste disposal, etc.). This could be severe resulting in permanent damage to the environment if not mitigated properly.</p>	<p><b>Mitigation for impact of labourers</b></p> <ul style="list-style-type: none"> <li>• Mitigation measures to counter impact on the natural environment and limit potential for crime during the construction phase are included in the EMP and include specifications in terms of control of construction workers (i.e. provision of toilet and cooking facilities, provision of either accommodation facilities or transport facilities, implementation of Environmental Educational Programmes, etc.). Accommodation for labourers must either be limited to guarding</li> </ul>
--	--

	<p>personnel on the construction site (with labourers transported to and from existing neighbouring towns) or a separate fenced and controlled area where proper accommodation and relevant facilities are provided.</p> <ul style="list-style-type: none"> <li>• The EMP further provides control measures for the environmental impacts at the site camps. The EMP includes specific provision for the management of the following: <ul style="list-style-type: none"> <li>○ Site location</li> <li>○ Solid waste</li> <li>○ Liquid effluent (sewage)</li> <li>○ Storm water</li> <li>○ Litter</li> <li>○ Nuisance (Noise)</li> <li>○ Hazardous substances</li> <li>○ Social pathologies (prostitution, drunkenness, theft)</li> <li>○ HIV/Aids prevention.</li> </ul> </li> <li>• Ensure that the contractors develop a comprehensive site camp management plan. This should apply even in the case of the limited accommodation camps recommended above.</li> <li>• Plan campsites an appropriate distance from any facility where it can cause a nuisance.</li> </ul>
--	--

**Impact on Safety and Security**

There could be concern about a range of safety and security issues that could result from the construction of the powerlines. These could be i.e. a threat to the safety of children or individuals in the area; mortality to stock and other farm animals close to the site; an increase in crime, including stock theft and poaching.

Landowners are concerned that construction workers could gain uncontrolled access to their property during the construction period as well as for maintenance - especially under emergency breakdown conditions.

**Mitigation for Impact on Safety and Security**

- The Contractor should erect a temporary fence around the camp site and work areas.
- All construction activities should take place within fenced or otherwise demarcated areas.
- The contractors must appoint their own guards to safeguard their materials.
- Construction workers should wear clearly identifiable clothing that allows land owners to easily identify contract workers on site.
- Once construction is completed, the contractor has to obtain written consent from the relevant landowner that the construction site, construction areas, access routes, etc. are sufficiently and adequately rehabilitated to the landowners' satisfaction.
- Communication between farmers and Eskom is of importance in case of emergency breakdowns.



<p><b>Impact on cultural heritage resources</b> Although not foreseen, it is possible that archaeological remains be unearthed during the construction process.</p>	<p><b>Mitigation for impact on cultural heritage resources</b> Should any evidence of artefacts, paleontological fossils, graves or other heritage resources be found during the course of construction, these must immediately be reported to SAHRA. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from SAHRA. SAHRA would probably require that an archaeologist accredited with the Association for Southern African Professional Archaeologist be appointed to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the proposed mitigation measures.</p>
---	--

<b>Indirect impacts</b>	<b>Mitigation</b>
No additional impact not described above.	Not applicable

<b>Cumulative impacts</b>	<b>Mitigation</b>
No additional impact not described above.	Not applicable

**OPERATIONAL PHASE**

<b>Direct Impacts</b>	<b>Mitigation</b>
<p><b>Impact on Birds</b> Three common problems are the electrocution of birds (and other animals); birds colliding with powerlines; insnetivie bush clearing during maintenance of the servitude.  A more detailed description is provided above, under the heading 'Planning and Design Phase'.</p>	<p><b>Mitigation for impact on birds</b> Mitigation measures as proposed in the Planning &amp; Design Phase should be implemented as soon as possible after the completion of the powerline. This should minimise possible impacts during the operational phase of the powerline. Monitoring of birdlife should take place. It is proposed that a communication system should be identified so that landowners could report on casualties on their properties so that additional actions could be identified taken to restrict future fatalities.</p>

<p><b>Impact of birds on the powerline</b> Bird streamer induced fault is caused by the bird releasing a "streamer" of faeces which can constitute an air gap intrusion between the conductor and the earthed structure. The fault</p>	<p><b>Mitigation - impact of the birds on the powerline</b> Bird streamer and bird pollution faulting is unlikely to be significant. The mitigation measures proposed to mitigate potential impact on the birds for electrocution should limit this impact.</p>
--	---

<p>appears to flash across the air gap. Bird nests may also cause faults through nest material protruding and constituting an air gap intrusion causing flashovers.</p>	<p>The use of the steel monopole will largely eliminate the streamer risk, as the design makes it difficult for birds to perch above the conductors.</p>
<p><b>Impact on Agricultural Activities</b>  The Eskom line might affect the agricultural activities underneath or in the vicinity of the powerline. Factors to consider regarding the impact on agriculture are the following:</p> <ul style="list-style-type: none"> <li>• No change in land use from agriculture to other land uses will take place.</li> <li>• Eskom will not own the servitude but will purchase the rights to maintain the powerline.</li> <li>• Poles for the powerline will be placed to avoid any existing structures such as pivot irrigation.</li> <li>• No clearing except for large trees is necessary under the powerline.</li> <li>• No firebreaks are necessary.</li> <li>• All normal agricultural activity can continue as usual.</li> </ul>	<p><b>Mitigation - Agricultural Activities</b>  The operation of the powerline should not impact on agricultural activities. A servitude would be registered on the applicable property which provides Eskom with the rights to maintain the line and the applicable land is therefore not purchased. All normal agricultural activity can continue as usual. No clearing of veld under the powerline is necessary except for large trees and no firebreaks under the line are required.</p>

<p><b>Indirect impacts</b></p> <p><b>Impact on Safety and Security – Fire Hazard</b>  Poor maintenance, bird collision, electrical faults as well as pylons struck by lightning could result in veld fires that could result in destruction of habitat and property and even severe injury and/or death.</p> <p>It is important to note Eskom's responsibilities in terms of the National Veld and Forest Fire Act, Act No 101 of 1998. Reference is made to Section 3(1) of the National Veld and Forest Fire Act which clearly indicates that owners may form an association for the purpose of predicting, preventing, managing and extinguishing veld fires. This implicates that it is voluntary to join a Fire Protection Agency and not mandatory according to the Act. As it is not mandatory to join a Fire Protection Agency, Eskom's maintenance staff working in the different areas is encouraged to join the Fire Protection Agencies if their work load and staff availability allows this.</p>	<p><b>Mitigation</b></p> <p><b>Mitigation for Impact on Safety and Security</b></p> <ul style="list-style-type: none"> <li>• The existing Eskom complaints structure must be updated on a regular basis and communicated with all affected landowners to ensure effective response and service supply (especially in terms of reporting of obvious electrical faults).</li> <li>• The contact details of all landowners affected by this proposed Eskom project as well as relevant Eskom staff must be listed and updated regularly and be communicated with all the stakeholders to ensure effective communication in the case of emergencies such as veldfires.</li> <li>• Annual fire management programmes will need to be implemented to manage the risk appropriately.</li> <li>• Branches and other debris resulting from pruning processes should not be left below conductors or in areas where it will pose a risk to infrastructure.</li> <li>• Debris shall not be burnt under any</li> </ul>
--	--

<p>Section 12 (1) of the National Veld and Forest Act reads as follows: "Every owner on whose land a veldfire may start or from whose land it may spread must prepare and maintain a firebreak on his or her side of the boundary between his or her land and adjoining land."          Servitudes are registered for all Eskom sub-transmission (33 to 132kV) powerlines and a wayleave agreement is obtained for the reticulation powerlines (11 and 22 kV).          According to a legal opinion obtained from the Corporate Legal Department, Eskom is not the land owner for powerline servitudes or rights of way, but only in the instance where substations are involved where Eskom purchased the land and is in possession of a title deed.</p>	<p>circumstances.</p> <ul style="list-style-type: none"> <li>• Fires shall not be made for the purpose of chasing or disturbing fauna.</li> <li>• Eskom encourages affected landowners and maintenance staff to participate in the Fire Protection Agency.</li> </ul>
--	---

<i>Cumulative impacts</i>	<i>Mitigation</i>
<p><b>Positive impact – provision of reliable power supply and an increase in load to the area</b>            Eskom is in the process of upgrading / constructing new powerlines within the wider Groblersdal / Marble Hall area and the 13km 132kV line as proposed in this report forms part of the upgrade of the entire network within this area.            The associated benefits of reliable and ample power supply to the wider area will benefit a variety of communities as well as providing a support base for the various economic activities that is relying on power to execute normal business practises.</p>	

### DECOMMISSIONING PHASE

<i>Impacts</i>	<i>Mitigation</i>
<p>The decommissioning of the new 132kV powerline is not envisioned at this stage and decommissioning does not form part of this project proposal. Impacts in this regard will therefore not be assessed.</p>	<p>Should it however be deemed necessary some time in the future that this line will be dismantled, a comprehensive decommissioning plan should be prepared which should include the following:</p> <ul style="list-style-type: none"> <li>○ A clear description of the agreed end use for the servitude.</li> <li>○ A schedule of activities to be carried out leading up to decommissioning, during the decommissioning period, and after</li> </ul>

	<p>decommissioning until closure is obtained for the servitude.</p> <ul style="list-style-type: none"> <li>○ Record of consultation with land owners, documenting the agreements reached regarding integration of the servitude with surrounding agricultural units</li> <li>○ Detailed rehabilitation specifications, including recommendation regarding earth works if necessary and specific measures to rehabilitate sensitive areas</li> <li>○ Environmental monitoring programme during decommissioning and to track subsequent rehabilitation performance</li> <li>○ Clear plans showing the agreed end use along the servitude length and sensitive areas and areas requiring special attention / focus (eg. Major river crossings)</li> </ul> <p>All environmental laws at the time that decommissioning is planned should be adhered to.</p>
--	--

### 3. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

It is evident that the biggest impact of the project on the environment is expected to occur during the construction phase. It is expected that with the proposed mitigation of impacts and the implementation of the Environmental Management Plan, the expected negative impact could be mitigated to acceptable measures.

#### EVALUATION METHOD FOLLOWED

The nature and extent of expected negative impacts are described directly under the heading for each impact.

Below this description for each impact, a table has been designed to facilitate evaluation of the expected negative impact in terms of significance (intensity), duration, probability and significance after mitigation.

The numerical values used for "Impact Severity" (significance / intensity) relates to the potential severity of the proposed project on the specific environmental component without any mitigation and is being evaluated and rated on a scale from 0 to 4 where the following values apply :

0 = no impact

1 = low impact

- 2 = medium impact
- 3 = significant impact
- 4 = severe impact

The duration of the expected negative impact is supplied as either "temporary" - 0-3 years (generally during construction) or "permanent". The probability that the expected negative impact would occur if not mitigated is rated as "low", "medium" or "high". The negative impacts are also evaluated in terms of the effectiveness with which it could be mitigated: "Severity of Impact after Mitigation" is rated on a scale from 0 to 4, with a severe impact after mitigation receiving a rating of 4 (and can therefore influence the viability of the project) and no impact after mitigation receiving a rating of 0.

## EVALUATION OF IMPACT AND EVALUATION OF MITIGATION MEASURES

### The Alternative 1 (Preferred Route Alternative) and Route Alternative 2 (Viable Alternative)

Please note:

The Alternative 1 (Preferred Alternative) and Alternative 2 (Viable Alternative) run along the same road. Optional sections in Route Alternative 2 were identified to indicate where the line could be built in the case of unforeseen problems arising along the preferred route. The impacts, and therefore the impact evaluation, for both of these alternatives will therefore be the same and this section is not completed for both alternatives.

### PLANNING & DESIGN PHASE

Impact Description	Impact Severity Degree (0 - 4)	Extent Local / Regional / National	Duration Temporary / Permanent	Probability Probability it would occur: low / medium / high	Severity of Impact After Mitigation
Impact on Natural Habitat	2	Local	Permanent	Medium	1
Impact on Water Resources	3	Local	Permanent	Medium	1
Impact on Birds	3	Local	Permanent	High	2
Impact on Cultural Heritage Resources	1	Local	Permanent	Low	1
Visual Impact	2	Local	Permanent	Low	1
Social Impact	3	Regional	Permanent	High	1
Impact of Improper Planning	4	Regional	Permanent	Low	1

### CONSTRUCTION PHASE

Impact Description	Impact Severity Degree	Extent Local / Regional / National	Duration Temporary / Permanent	Probability Probability it would occur: low / medium / high	Severity of Impact After Mitigation
Impact on Natural Habitat	3	Local	Temporary	Medium	1
Impact on Birds	3	Local	Temporary	Medium	1

Impact on Water Resources	3	Regional	Temporary	Medium	1
Impact on Erosion	3	Local	Temporary	High	1
Impact of Labourers	3	Local	Temporary	Low	1
Impact on Safety & Security	3	Local	Temporary	Low	1
Impact on Cultural Heritage Resources	1	Local	Temporary	Low	1

## OPERATIONAL PHASE

Impact Description	Impact Severity Degree	Extent Local / Regional / National	Duration Temporary / Permanent	Probability Probability it would occur: low / medium / high	Severity of Impact After Mitigation
Impact on Birds	2	Regional	Permanent	Medium	1
Impact of birds on the powerline	2	Regional	Permanent	Low	1
Impact on Agricultural Activities	2	National	Permanent	High	1
Impact on Safety Security	3	Local	Permanent	Medium	1

### No-go alternative (compulsory)

The need for the proposed Marble NDP Project was identified as a result the current load that is growing at a very rapid rate. Numerous developments have submitted applications for power supply and the current substations in the macro area cannot meet this demand - they have run out of spare capacity. Without this project future electricity demand cannot be met and development applications could be stalled indefinitely and/or refused with the resultant negative impact on the economy that would have been stimulated by new development.

The status quo cannot ensure the long-term, regional benefits of reliable power supply. The resultant social and economic benefits will also not be obtained should the project not go ahead.

The No Go Alternative cannot be considered a viable alternative, because the following will not realise if the project does not go ahead:

- Proper and reliable infrastructure creates a sense of well-being and prosperity.
- The long-term, regional benefits of reliable power supply is important for economic growth in the area that would result in new development, stimulation of the markets, optimal utilisation of existing infrastructure, as well as the upgrade and maintenance of infrastructure
- The resultant socio-economic benefits are obvious. Job opportunities will be created - short term during construction of the developments and long term during the operational phases of the development (farm workers, maintenance, gardens, domestic workers, security personnel, etc.).
- Existing Eskom users in the area will benefit by the proposed 132kV line because it is anticipated that the network performance will improve and the duration and frequency of supply interruptions will be minimal.

## SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?

YES	NO
-----	----

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

Not applicable

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

### **Conclusion :**

The environmental consultants are confident of the following :

- A lot of effort went into investigation different route alternatives and confirming a Preferred Route and a Viable Alternative Route.
- Reasonable consensus had been reached with regards to the Preferred Alternative and the Viable Alternative Route sections.
- An extensive Public Participation Programme was followed and all Interested and Affected Parties had been allowed ample time to give input. All comment communicated throughout this EIA process had been documented and is addressed satisfactorily in the BAR.
- The specialists did not identify any sensitive environmental components that could be impacted upon as a result of the project which cannot be mitigated to acceptable levels.
- With the implementation of the Environmental Management Programme it is expected that the project will not result in a severe permanent impact on the environment.

This Preferred Route Alternative is proposed because :

- It runs as far as possible adjacent to the proposed Eskom Transmission route (the Burotho-Marble Hall 400kV – indicated as a purple line above) in an attempt to restrict visual impact and impact on the environment and agricultural activities.
- It is the shortest viable route between the existing Wolvekraal Substation and the proposed new Moutse Substation site – economically viable for Eskom.
- The route runs as far as possible along farm boundaries, existing fences and roads.
- Minimal and no impact on irrigation systems or any other structures and agricultural activities will occur. Specific detail and landowner requirement on site will be clarified during the negotiation period.
- Impact on natural habitat will be minimised. The route follows as far as possible existing infrastructure such as farm roads and game fences, mostly along disturbed land.
- No wetland areas will be affected.
- Impact on game will be minimal.
- Reasonable access is possible.
- The route was tested with all the landowners during the meetings with individuals and the Public Open Day. The route as proposed had been accepted in principle by the potentially affected landowners.
- A 100m corridor was investigated to allow for slight deviations along the final proposed route once the final land acquisition documents are signed – to accommodate details such as existing and planned agricultural activities (i.e. sheds, pivot irrigation structures, etc.)

**Recommendations :**

It is recommended that DEA give authorisation for the construction of the power line on Alternative 1 (the Preferred Alternative), with the instruction that slight deviation within the 100metre corridor that was investigated could take place to accommodate site-specific requirements of the landowners during negotiations.

Before construction can commence the tower positions of the powerline have to be confirmed with the ecologist on site to ensure that the structures do not impact on sensitive areas or components.

YES	NO
-----	----

Is an EMPr attached?

The EMPr must be attached as Appendix F.



## SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

### Appendix A: Site plan(s)

- Preferred Route Alternative & Route Alternative 2
- Route alignments initially investigated

### Appendix B: Photographs

- Photographs of the proposed route

### Appendix C: Facility illustration(s)

- Details of the proposed powerline structures

### Appendix D: Specialist reports (including terms of reference)

- Ecological Assessment – Enviroguard Ecological Services CC
- Bird Impact Assessment Study - Chris van Rooyen Consulting
- Phase 1 Heritage Impact Assessment - Archaetnos Culture & Cultural Resource Consultants

### Appendix E: Comments and responses report

### Appendix F: Environmental Management Programme (EMPr)

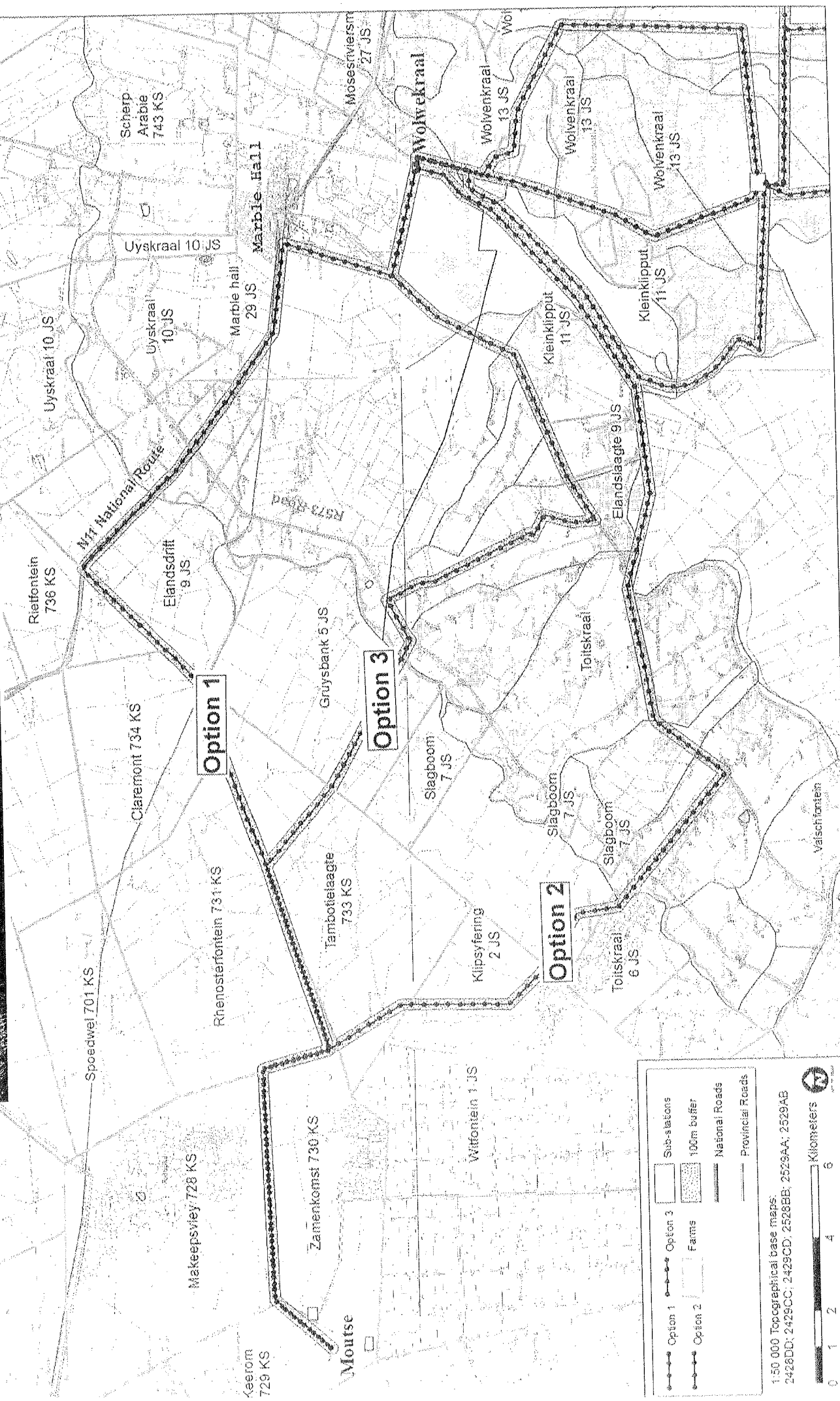
### Appendix G: Other information

- **Public Participation Programme**
  - PPP process followed
  - Newspaper advertisements
  - Proof of onsite notification
  - First Phase Notification Letter
  - Invitation to Open Day
  - Open Day attendance list (held on 9 March 2011)
  - Minutes of meeting with tribal office at Zamenkomst
  - Register of Interested & Affected Parties
  - Written comment received
- List of Directly Affected Landowners (for both Preferred and Viable Alternative Routes)
- Landscape Dynamics Company Profile

### **Appendix A: Site plan(s)**

- Route alignments initially investigated
- Proposed Route with Viable Alternative
- Route coordinates (every 250 m intervals)

# Route options initially investigated



	Option 1		Sub-stations
	Option 2		Farms
	Option 3		100m buffer
			National Roads
			Provincial Roads

1:50 000 Topographical base maps:  
 2428DD; 2429CC; 2429CD; 2528BB; 2529AA; 2529AB

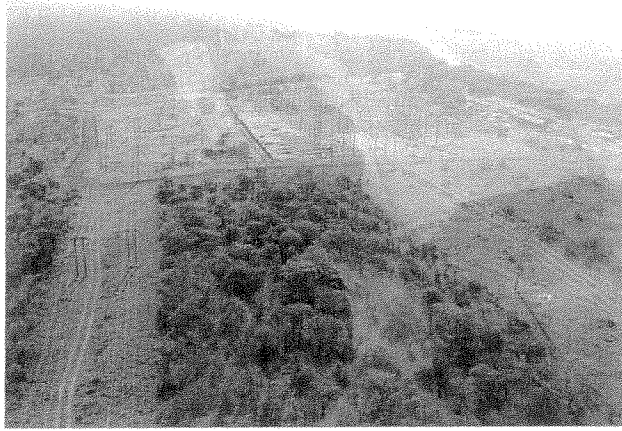
0 1 2 4 6  
 Kilometers

## Appendix B: Photographs

- Photographs of the proposed route

**ESKOM MARBLE HALL NDP PROJECT : WOLVEKRAAL TO MOUTSE  
PHOTOGRAPHS OF THE PROPOSED ROUTE AND ALTERNATIVE**  
(Please refer also to photographs in the main BAR document as well as included in the specialist reports.)

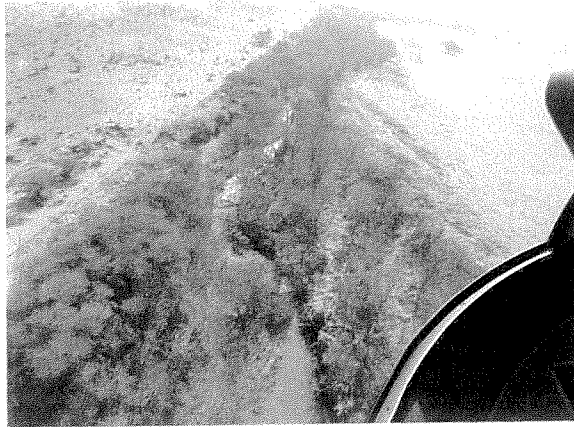
**Existing Wolvekraal Substation (an Eskom Distribution substation)**



**Typical land use across eastern section of the proposed route – agricultural lands – some fallow, some planted with crops with pivot irrigation, etc.**



This photo shows the approximate area where the powerline will cross the Elands River. The river vegetation is heavily invested with alien vegetation species. The river system must however be protected because all river systems are considered ecologically important and have to be protected. Pylons will be placed outside the 1:100 year floodline



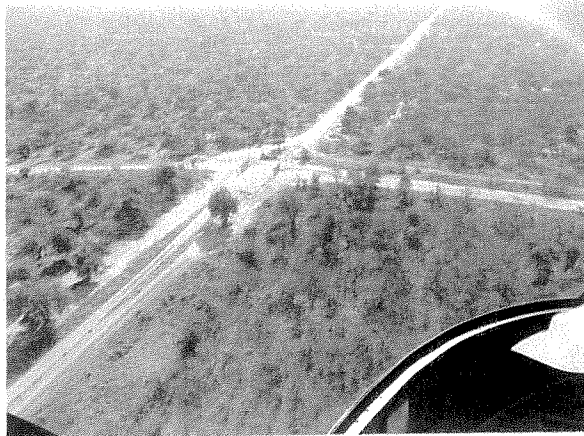
Wetland area where the route had to be deviated so as to ensure that no wetland areas are affected – to ensure also that no Water Use License Application would be applicable



Dense *Acacia tortilis* encroachment (low species richness) as a result of removal of indigenous vegetation for grazing and/or agricultural vegetation is evident

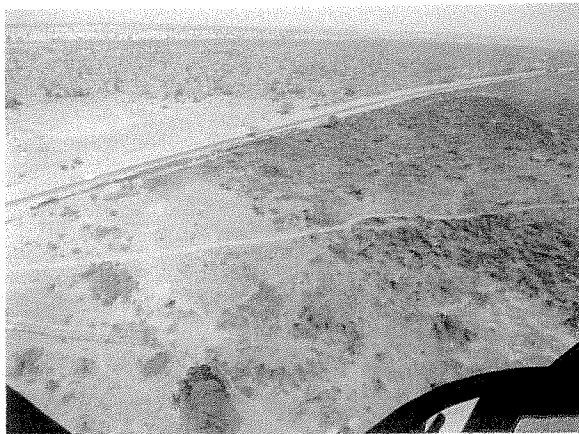


Typical view across the middle and western study area – game farms with variation between intact and slightly degraded indigenous vegetation



The far western section of the powerline route across tribal land – severely degraded as a result of overgrazing and wood collecting. The two photo's depict the Moutse Substation site alternatives – both situated on state land under the jurisdiction of the Zamenkomst Tribal Authority

Preferred locality for Moutse Substation site



Alternative locality for Moutse Substation site



### **Appendix C: Facility illustration(s)**

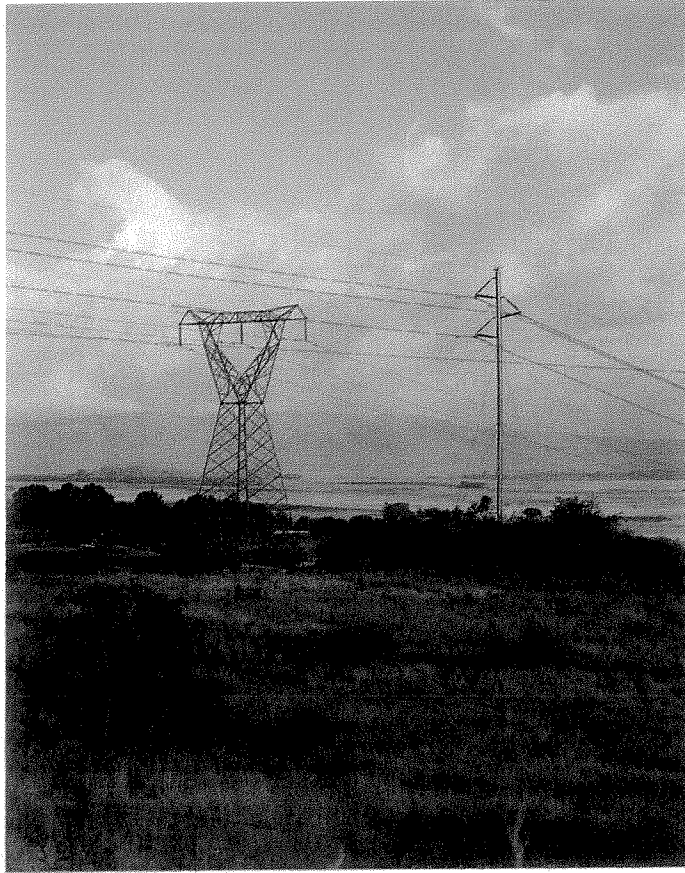
- Details of the proposed powerline structures



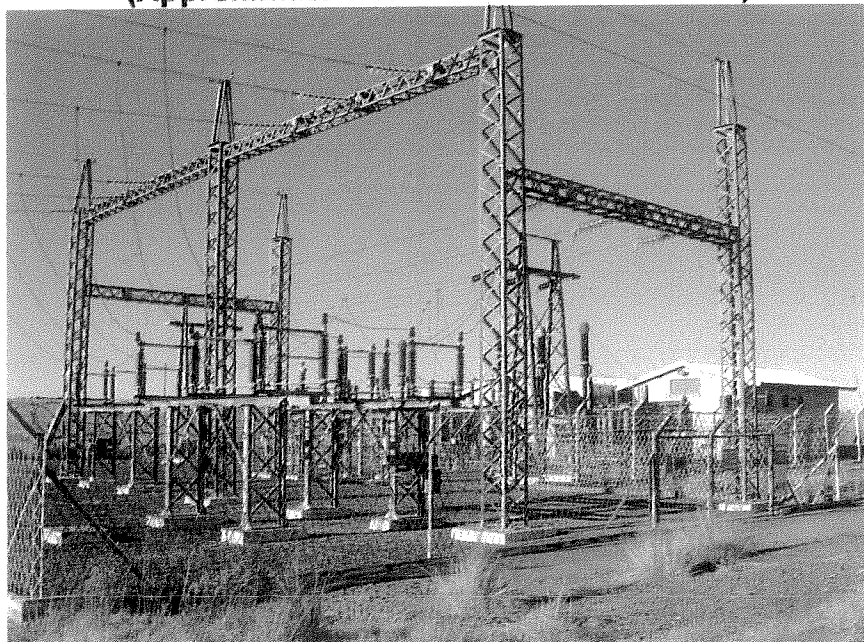
**Eskom Marble Hall NDP Project: Wolvekraal to Mouts**  
**Typical examples of structures to be used**

**Monopole steel structures**

**(the structure on the righthand side will be used  
– photo illustrates difference with structures previously used)**



**Typical Example of an Eskom Distribution Substation Site**  
**(Approximate size of site is 100mX150m)**



#### **Appendix D: Specialist reports (including terms of reference)**

- Ecological Assessment – Enviroguard Ecological Services CC
- Bird Impact Assessment Study - Chris van Rooyen Consulting
- Phase 1 Heritage Impact Assessment - Archaetnos Culture & Cultural Resource Consultants

---

**Eskom Proposed Eskom Marble Hall NDP Project :  
Approximately 40 km 132 kV Powerline from  
Wolvekraal Substation to and including the new  
Moutse Substation**

**SPECIALIST REPORT ON THE  
VEGETATION OF THE AFFECTED AREAS**

by

**L.R. BROWN PhD PrSciNat, MGSSA**

Commissioned by

**Landscape Dynamics Environmental Consultants**

---

**ENVIROGUARD ECOLOGICAL SERVICES CC**

PO Box 703  
Heidelberg  
1438

Cell: 082 4641021  
Fax: 0880163491108  
[envyguard@telkomsa.net](mailto:envyguard@telkomsa.net)

**July 2011**

© 2010  
Enviroguard Ecological Services cc

## CONTENTS

TERMS OF REFERENCE .....	3
Project Description: .....	3
Project Locality: .....	3
Aim of this assessment: .....	3
ASSIGNMENT .....	4
CONDITIONS RELATING TO THIS REPORT .....	5
Factors limiting the quality of this study .....	5
Approach .....	5
Declaration of interest .....	5
Indemnity .....	5
Copyright .....	6
INTRODUCTION .....	7
STUDY AREA .....	8
Location .....	8
Climate .....	8
Geology .....	10
METHODS .....	11
Data recorded included: .....	11
Red data species .....	12
Data processing .....	12
Symbols .....	13
RESULTS .....	14
1. <i>Dichrostachys cinerea-Terminalia sericea</i> woodland .....	15
2. <i>Combretum apiculatum-Peltophorum africanum</i> woodland .....	19
3. <i>Acacia tortilis</i> woodland .....	22
4. River vegetation .....	25
5. Agricultural lands .....	28
DISCUSSION .....	30
i. ENVIRONMENT .....	30
ii. IMPACT EVALUATION .....	34
iii. SENSITIVITY ANALYSIS .....	37
CONCLUSION .....	38
REFERENCES .....	40
POSSIBLE RED DATA SPECIES .....	41

## **TERMS OF REFERENCE**

### **Project Description:**

ESKOM is planning the construction of a 132kV Powerline from Wolvekraal Substation to Marble Hall MTSMoutse Substation. The powerline route and locality of the substation will be determined during the EIA process.

### **Project Locality:**

The project area includes the areas west of Marblehall.

### **Aim of this assessment:**

The aim of the impact assessment is to present floristic descriptions of the different vegetation units encountered within the study area and to highlight sensitive attributes and areas within the environment that might be adversely affected by the proposed development. The impacts are to be evaluated and pertinent mitigating actions recommended

## ASSIGNMENT

Enviroguard Ecological Services cc. was commissioned by Landscape Dynamics Environmental Consultants to assess the vegetation and to compile a plant species list for the proposed route suggested by Eskom.

The assignment is interpreted as follows: Compile a study on the Flora of the area.

### 1. *Initial preparations:*

- Obtain all relevant maps, and information on the natural environment of the area concerned, including a red data species list for the vegetation.

### 2. *Vegetation and habitat survey: In each sample plot*

- List the plant species (trees, shrubs, grasses and other herbaceous species of special interest) present for plant community and ecosystem delimitation.
- Identify potential red data plant species, possible encroacher species and exotic plant species.

### 3. *Plant community delimitation and description*

- Process data (vegetation and habitat classification) to determine vegetation types on an **ecological** basis.
- Describe the habitat and vegetation
- Prepare a vegetation map of the area.

### 4. *General*

- Identify and describe ecological sensitive areas.
- Identify problem areas in need of special treatment or management, e.g. bush encroachment, erosion, degraded areas, reclamation areas.
- Make recommendations on aspects that should be monitored during development.

## **CONDITIONS RELATING TO THIS REPORT**

### **Factors limiting the quality of this study**

The study was done during the middle of winter (June 2011). Thus only those flowering plants that flowered at the time of the visit and trees recognisable during this time could be identified with high levels of confidence. Some of the more rare and cryptic species may have been overlooked due to their inconspicuous growth forms. Many of the rare and endangered succulent species can only be distinguished (in the veld) from their very similar relatives on the basis of their reproductive parts. These plants flower during different times of the year. Multiple visits to any site during the different seasons of the year could therefore increase the chances to record a larger portion of the total species complex associated with the area. Not all areas could be accessed due to farm fences and inaccessibility of the terrain. The survey of the study site is however considered as successful with a correct identification of the different vegetation units.

### **Approach**

Conclusions reached and recommendations made are based not only on occurrence of individual species, but more appropriately on habitats and ecosystem processes. Planning must therefore allow for the maintenance of species, habitats and ecosystem processes, even if Red Data or endemic plant species are absent.

### **Declaration of interest**

Enviroguard Ecological Services cc has no vested interest in the property studied nor is it affiliated with any other person/body involved with the property and/or proposed development. Enviroguard Ecological Services cc is not a subsidiary, legally or financially of the proponent.

The vegetation survey was conducted by Prof. LR Brown. He is registered as a Professional Natural Scientist (Reg. No. 400075/98) in the fields of Botanical Science and Ecological Science.

### **Indemnity**

Although Enviroguard Ecological Services cc exercises due care and diligence in rendering services and preparing documents, the client takes full responsibility for

this assessment in terms of the National Environmental Management Act of 1998, and exempt Enviroguard Ecological Services cc and its associates and their sub-contractors from any legal responsibility based on the timing of the assessment, the result and the duration thereof, which has an influence on the credibility and accuracy of the assessment. Enviroguard Ecological Services cc accepts no liability, and the client, by receiving this document, indemnifies Enviroguard Ecological Services cc and its directors, managers, agents and employees against all actions, claims, demands, losses, liabilities, costs, damages and expenses arising from or in connection with services rendered, directly or indirectly by Enviroguard Ecological Services cc and by the use of the information contained in this document.

### **Copyright**

Copyright on the intellectual property of this document (e.g. figures, tables, analyses & formulas) vests with Enviroguard Ecological Services cc. The Client, on acceptance and payment of this report shall be entitled to use for its own benefit:

- The results of the project;
- The technology described in any report;
- Recommendations delivered to the Client.





## STUDY AREA

### Location

The study area is located west and north of the town of Groblersdal in the Limpopo Province of South Africa (Figure 1). The area comprises large scale commercial agricultural farming areas and game farms.

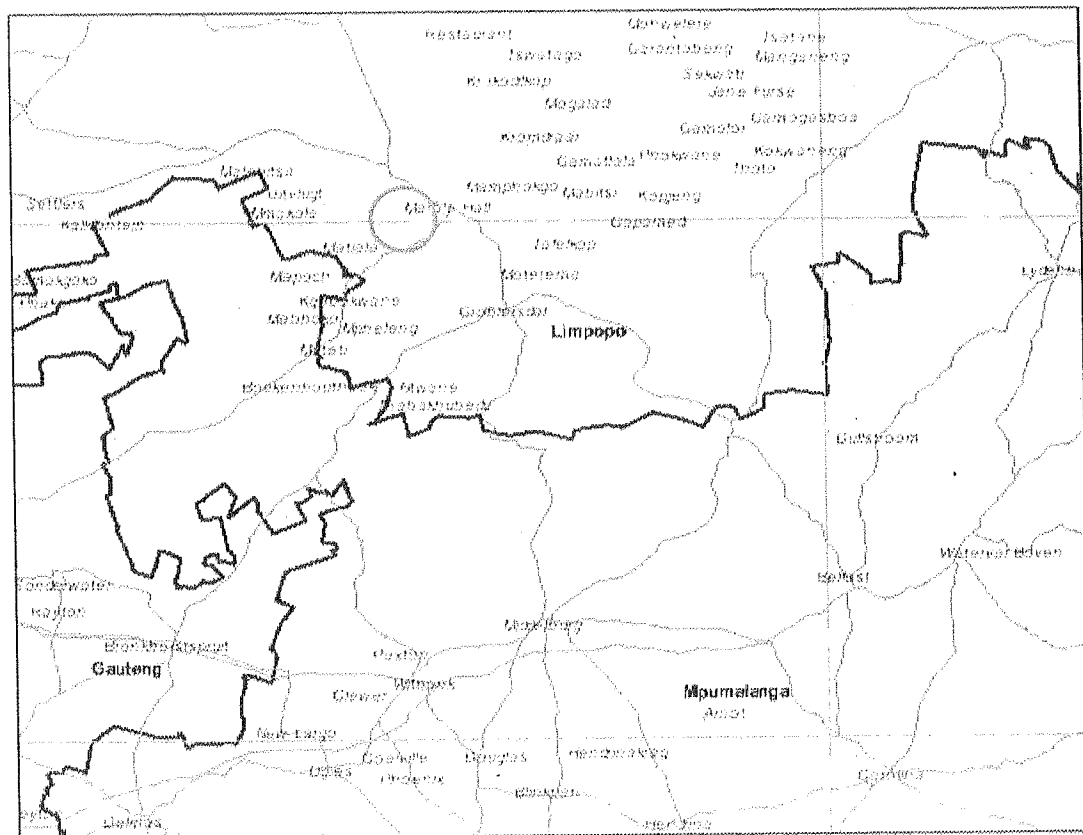
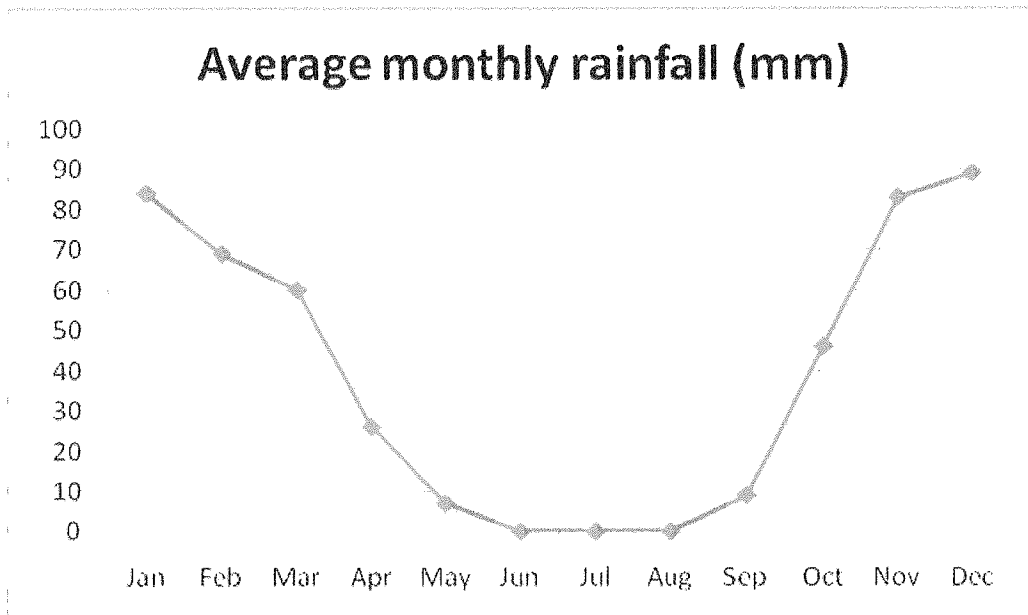


Figure 1a: Location of the study areas (red circle).

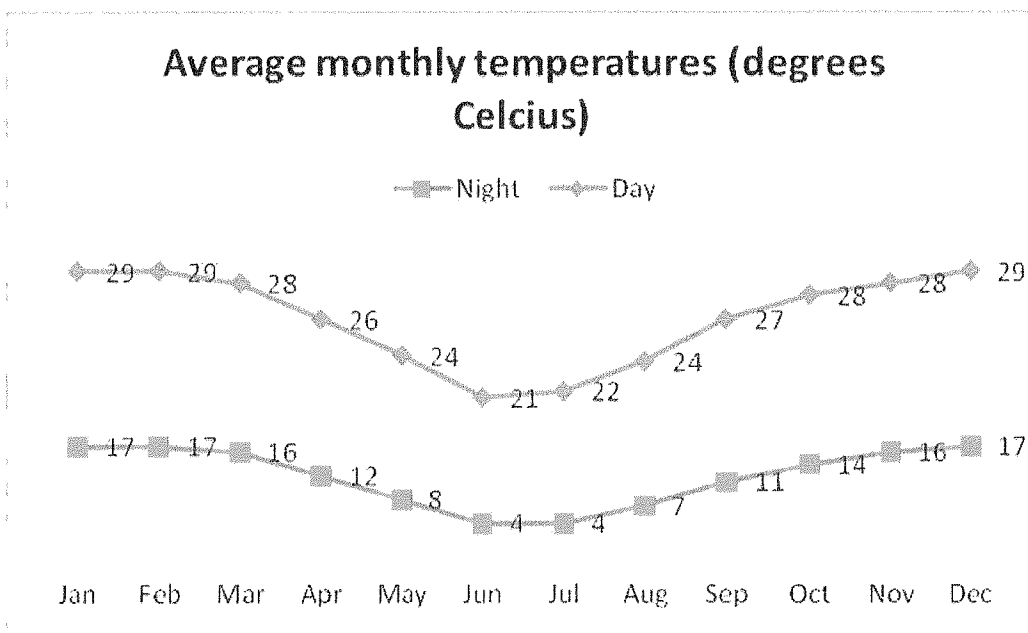
### Climate

The average annual rainfall for Marblehall is approximately 473mm with most rainfall taking place during summer. The average monthly rainfall is indicated in Figure 1b. The highest rainfall is experienced during November, December and January with June, July and August the driest months (Figure 1b). The average annual daily temperature is 26°C with evening temperature 11.9°C. The average day and night maximum temperatures range from 21.5°C in June to 29.4°C in January. The region is the coldest during July when the mercury drops to 4.1°C on average during the

night. The highest summer temperature is 36.8°C and the coldest winter temperature recorded is -1.2°C. ([http://www.saexplorer.co.za/south-africa/climate/groblersdal\\_climate.asp](http://www.saexplorer.co.za/south-africa/climate/groblersdal_climate.asp)).



**Figure 1b.** Average monthly rainfall for the study area (



**Figure 1c.** Average monthly temperatures for the study area





## Red data species

An investigation was also carried out on rare and protected plants that might possibly occur in the region. For this investigation the National Red List of Threatened Plants of South Africa, compiled by the Threatened Species Programme, South African National Biodiversity Institute (SANBI) was used. The actual presence of rare and protected species were recorded during the field visit.

## Data processing

A classification of vegetation data was done based on the plant species groupings and occurrence to identify, describe and map vegetation units. The descriptions of the vegetation units include the tree, shrub and herbaceous layers.

The **conservation priority** of each vegetation unit was assessed by evaluating the plant species composition in terms of the present knowledge of the vegetation of the Gauteng area, and the Grassland and Savanna Biomes of South Africa.

The following four **conservation priority** categories were used for each vegetation unit:

- High:** Area with high species richness and habitat diversity; presence of viable populations of red data plant species OR suitable habitat for such species; presence of unique habitats; less than 5% pioneer/alien plant species present. These areas are ecologically valuable and important for ecosystem functioning. This land should be conserved and managed and is not suitable for development purposes.
- Medium:** An area with a relatively natural species composition; not a threatened or unique ecosystem; moderate species and habitat diversity; between 5-20% pioneer/alien plant species present; that would need moderate to major financial input to rehabilitate to an improved condition; and where low density development could be considered with limited impact on the vegetation / ecosystem. It is recommended that certain sections of the vegetation are maintained.
- Low-medium:** Area with relatively natural vegetation, though a common vegetation type; moderate to low species and habitat diversity; previously or currently degraded or in secondary successional phase; between 20-40% pioneer and/or alien plant species; low ecosystem functioning; low rehabilitation potential.
- Low:** A totally degraded and transformed area with a low habitat diversity and ecosystem functioning; no viable populations of natural plants; >40% pioneer and/or alien plant species present; very low habitat uniqueness; whose recovery potential is extremely low; and on which development could be supported with little to no impact on the natural vegetation / ecosystem.

A **sensitivity analysis** was done for the vegetation units identified. This was achieved by evaluating the different vegetation units against a set of habitat criteria. For impact assessment the **potential impacts** on the vegetation was assessed by using the NEMA 2006 guidelines and criteria. To further quantify the severity of each impact, values were assigned to criteria ratings (Table 1).

**Table 1:** Criteria, criteria ratings and values (in brackets) used in this study to assess possible impacts on vegetation during the proposed development

Criteria	Rating (value)
Extent of impact	Site (1), Region (2), National (3), International (4)
Duration of impact	Short term (1), Medium term (2), Long term (3), Permanent (4)
Intensity of impact	Low (1), Medium (2), High (3)
Probability of impact	Improbable (1), Probable (2), Highly probable (3), Definite (4)

## Symbols

All exotic species are indicated in red

## RESULTS

Seven distinct vegetation units could be identified and are indicated in Figure 3 namely:

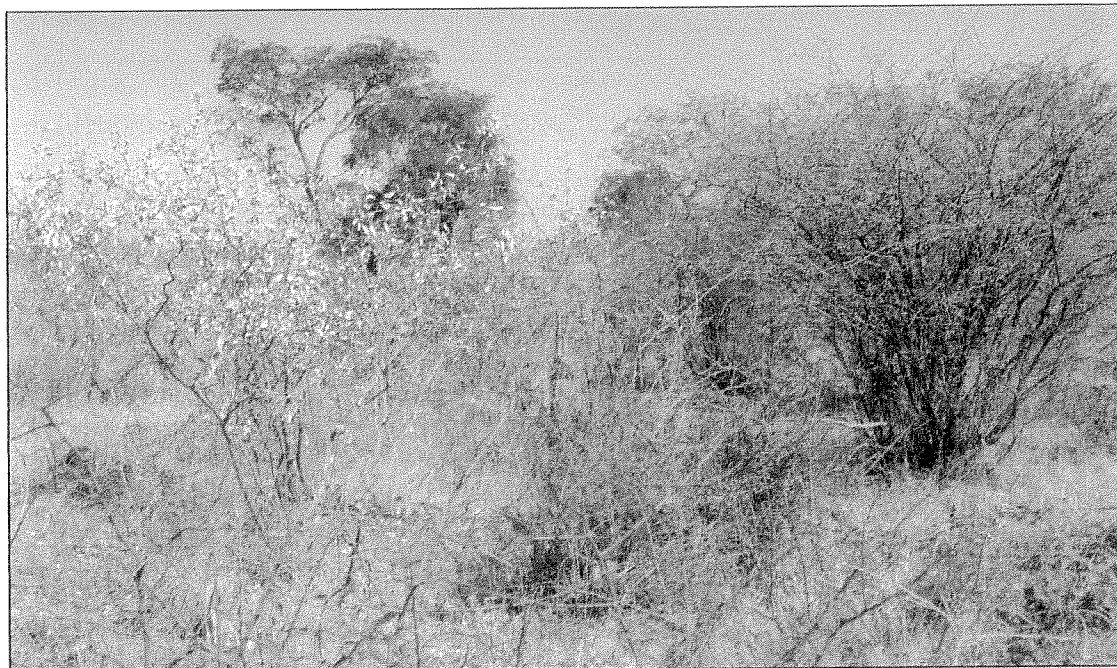
1. *Dichrostachys cinerea-Terminalia sericea* woodland
2. *Combretum apiculatum-Peltophorum africanum* woodland
3. *Acacia tortilis* woodland
4. River vegetation
5. Agricultural lands



**Figure 3.** Vegetation units of the study area (Unit 1 = purple; Unit 2 = red; Unit 3 = orange; Unit 4 = blue; Unit 5 = green) (Google spot image 2010).



1. *Dichrostachys cinerea*-*Terminalia sericea* woodland

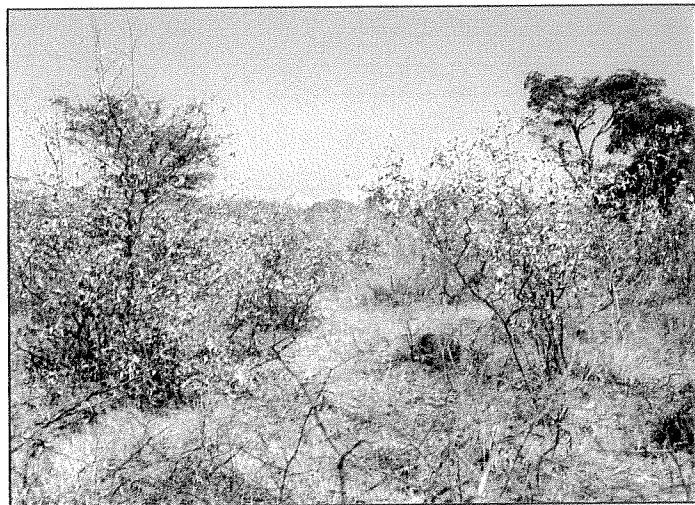


Mapping unit	1	Tree cover	10-20%
Soil	Red medium deep - loam	Shrub cover	15-55%
Topography	Mostly level (1-2 <sup>0</sup> )	Herb cover	3%
Land use	Grazing	Grass cover	65-80%
Unit status	Dense degraded woodland	Rock cover	3-5%
Conservation priority	Low	Erosion	1%
Dominant spp.	<i>Dicrostachys cinerea</i> ; <i>Terminalia sericea</i> ; <i>Eragrostis rigidior</i> ; <i>Acacia tortilis</i> ; <i>Cereus jamacaru</i>		

This relatively dense woodland is found on terrain that is mostly level with low rock cover (3-5%). The soil is red and varies between sandy to loamy with a medium depth.

The vegetation is dominated by the shrubs *Dichrostachys cinerea*, *Terminalia sericea* and the grass *Eragrostis rigidior*, together with the category 1 declared invader *Cereus jamacaru*. The woody *Acacia tortilis* and *Euclea undulata* are locally prominent. Other species present include the woody *Acacia nilotica*, *Boscia albitrunca*, *B foetida*, the grasses *Heteropogon contortus*, *Cynodon dactylon*, *Urochloa mosabicensis* and the forbs *Vernonia oligocephala*, and *Nidorella hottentotica*. The indigenous invader tree *Acacia mellifera* is also present.

One variant of this unit occurs in the west namely the *Terminalia sericea* variant. This variant is found towards the west and is located next to a formal and informal housing area. The area is heavily utilised due to cattle grazing as well as wood harvesting. This has resulted in most of the tall trees been removed with mainly shrubs remaining.

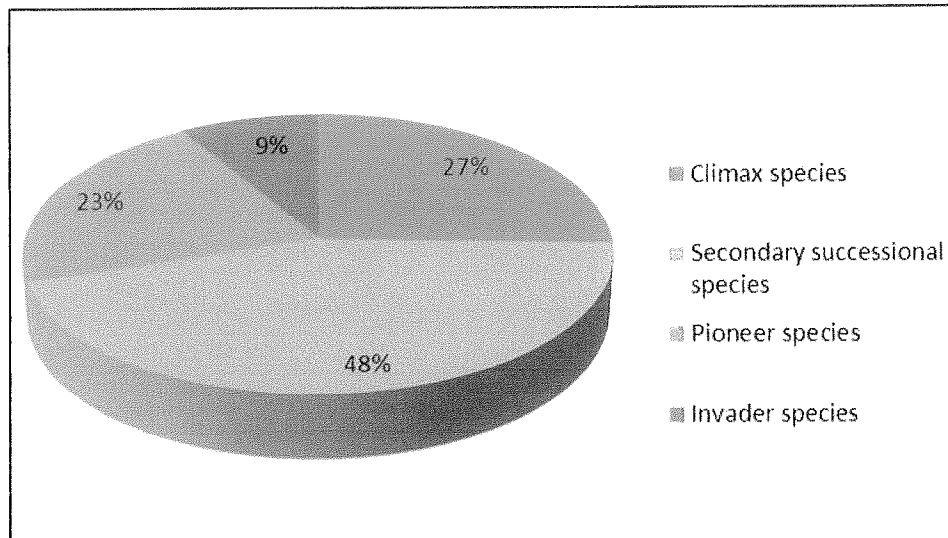


This area is heavily overgrazed as is evident from the dominance of the grass *Eragrostis rigidior* and the invasion of *Cereus jamacaru*.

A large section of the proposed powerline passing through this unit will be in an existing Eskom power line path which will result in little disturbance of the vegetation. In these areas where the woody vegetation has been cleared the secondary successional grasses such as *Eragrostis curvula*, *Hyperthelia disoluta*, *Eragrostis rigidior* are prominent.

The woody species covers up to 70% of the area with the shrubs contributing the most. The grasses cover between 65 and 80% of the soil and is dominated by secondary successional species. This vegetation unit has a medium species

richness, but is dominated by secondary successional species. The species composition comprises 27% climax species, 32% pioneer species and 48% secondary successional species. A total of 17% of the species are indigenous and exotic invaders (Figure 4)



**Figure 4.** Species composition for the *Dichrostachys cinerea-Eragrostis rigidior* woodland

#### Red data species

No red data species were found within this vegetation unit and it is doubted whether any such species will be present as a result of the degraded condition of the land.

The following is a list of species identified during the survey:

#### WOODY SPECIES

- Acacia karroo Hayne
- Acacia nilotica
- Acacia tortilis (Forssk.) Hayne
- Asparagus suaveolens
- Boscia foetida Schinz
- Boscia albitrunca
- Dichrostachys cinerea (L.) Wight & Arn.
- Euclea undulata Thunb.
- Jacaranda mimosifolia D. Don
- Maytenus heterophylla (Eckl. & Zeyh.) N. Robson
- Melia azedarach L.
- Peltophorum africanum Sond.
- Tarchonanthus camphoratus L.

*Terminalia sericea*  
*Ziziphus mucronata* Willd.

#### GRASSES

*Aristida congesta* Roem. & Schult. ssp. *congesta*  
*Aristida stipitata* Hack.  
*Cenchrus ciliaris* L.  
*Cynodon dactylon*  
*Enneapogon scoparius* Stapf  
*Eragrostis capensis* (Thunb.) Trin.  
*Eragrostis curvula* (Schrad.) Nees  
*Eragrostis rigidior* Pilg.  
*Heteropogon contortus* (L.) Roem. & Schult.  
*Melinis repens* (Willd.) Zizka  
*Panicum coloratum* L.  
*Panicum maximum* Jacq.  
*Sporobolus africanus* (Poir.) Robyns & Tournay  
*Urochloa panicoides* P.Beauv.

#### FORBS

*Aloe greatheadii* Sch"nland  
*Aloe marlothii* A.Berger  
*Cereus jamacaru* DC.  
*Commelina africana* L.  
*Conyza albida* Spreng.  
*Flaveria bidentis* (L.) Kuntze  
*Gomphrena celosioides* Mart.  
*Ipomoea crassipes* Hook.  
*Ipomoea* species  
*Justicia flava* (Vahl) Vahl  
*Opuntia ficus-indica* (L.) Mill.  
*Rhynchosia minima* (L.) DC.  
*Riccardia brasiliensis*  
*Senecio* species  
*Sonchus oleraceus* L.  
*Teucrium trifidum* Retz.  
*Vernonia natalensis* Sch.Bip. ex Walp.  
*Waltheria indica*

## 2. *Combretum apiculatum*-*Peltophorum africanum* woodland



Mapping unit	4	Tree cover	5-30%
Soil	Red-yellow gravelly	Shrub cover	10-55%
Topography	Mostly level (1-2 <sup>0</sup> )	Herb cover	5%
Land use	Grazing	Grass cover	40-60%
Unit status	Open to closed woodland	Rock cover	1%
Conservation priority	Medium	Erosion	1%
Dominant spp.	<i>Combretum apiculatum</i> ; <i>Peltophorum africanum</i> ; <i>Terminalia sericea</i> ; <i>Themeda triandra</i>		

This vegetation unit is located on higher-lying shallow to medium deep gravelly granitic soil on game farms. Rock cover is low estimated at 5%.

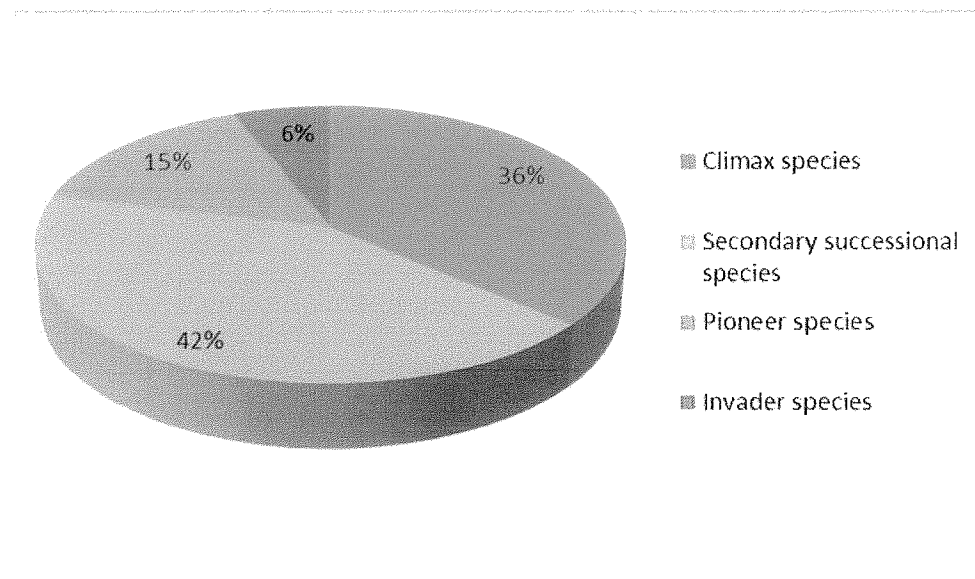
The vegetation is dominated by the trees *Combretum apiculatum* and *Peltophorum africanum* while the indigenous invasive tree *Terminalia sericea* is present in slightly lower-lying areas where the soil is deeper and more sandy. The dominant grass is *Themeda triandra*. Prominent species include the shrubs *Euclea undulata*, *Dichrostachys cineres* and the grasses *Eragrostis curvula*, *Tricholaenia monachne*, and the forbs *Waltheria indica*, *Indigofera comosa* and *Kohautia amatymbica*.

This community is fairly natural though bush densification has taken place in some areas and will need management intervention. A dense clump of the tree *Spirostachys africanus* is found within this community on the central to western part of the



study area on the game farm while single individuals of the protected tree *Sclerocarrya birrea* is found spread throughout this vegetation unit.

Most of the species in this community are secondary successional and climax species (42% and 36% respectively) with just two invader species identified (Figure 5).



**Figure 5.** Species composition for the *Acacia tortilis* mixed woodland

### Red data species

No red data species were found within this vegetation unit.

The following is a list of species identified during the survey:

#### **WOODY SPECIES**

*Acacia tortilis* (Forssk.) Hayne  
*Combretum apiculatum* Sond.  
*Combretum hereroense* Schinz  
*Combretum molle* R.Br. ex G.Don  
*Dichrostachys cinerea* (L.) Wight & Arn.  
*Euclea undulata* Thunb.  
*Maytenus heterophylla* (Eckl. & Zeyh.) N.Robson  
*Maytenus polyacantha* (Sond.) Marais  
*Peltophorum africanum* Sond.  
*Sclerocarya birrea* (A.Rich.) Hochst.  
*Spirostachys africana* Sond.  
*Terminalia sericea* Burch. ex DC.

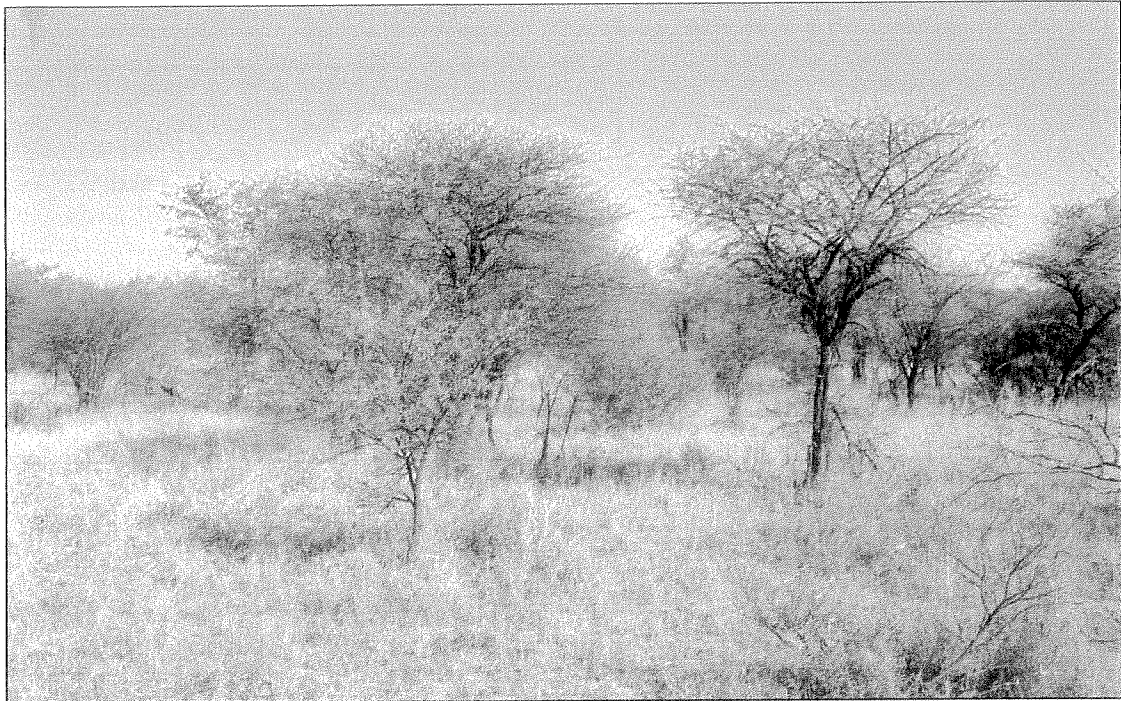
#### **GRASSES**

*Aristida meridionalis* Henrard  
*Aristida stipitata* Hack.  
*Eragrostis curvula* (Schrad.) Nees  
*Heteropogon contortus* (L.) Roem. & Schult.  
*Melinis repens* (Willd.) Zizka  
*Pogonarthria squarrosa* (Roem. & Schult.) Pilg.  
*Themeda triandra* Forssk.  
*Tricholaena monachne* (Trin.) Stapf & C.E.Hubb.  
*Trichoneura grandiglumis* (Nees) Ekman

#### **FORBS**

*Ceratotheca triloba* (Bernh.) Hook.f.  
*Cereus jamaecaru* DC.  
*Hermannia glanduligera* K.Schum.  
*Indigofera comosa* N.E.Br.  
*Kohautia amatymbica* Eckl. & Zeyh.  
*Kyphocarpa angustifolia* (Moq.) Lopr.  
*Limeum viscosum* (J.Gay) Fenzl  
*Opuntia ficus indica* (L.) Mill  
*Polygala hottentotta* C.Presl  
*Solanum panduriforme* E.Mey.  
*Waltheria indica* L.  
*Zornia milneana* Mohlenbr.

### 3. *Acacia tortilis* woodland



<b>Mapping unit</b>	4	<b>Tree cover</b>	5-30%
<b>Soil</b>	Red-yellow clayey	<b>Shrub cover</b>	10-55%
<b>Topography</b>	Mostly level (1-2 <sup>0</sup> )	<b>Herb cover</b>	5%
<b>Land use</b>	Grazing	<b>Grass cover</b>	40-60%
<b>Unit status</b>	Open to closed woodland	<b>Rock cover</b>	1%
<b>Conservation priority</b>	Low	<b>Erosion</b>	1%
<b>Dominant spp.</b>	<i>Acacia tortilis</i> ; <i>Euclea undulata</i>		

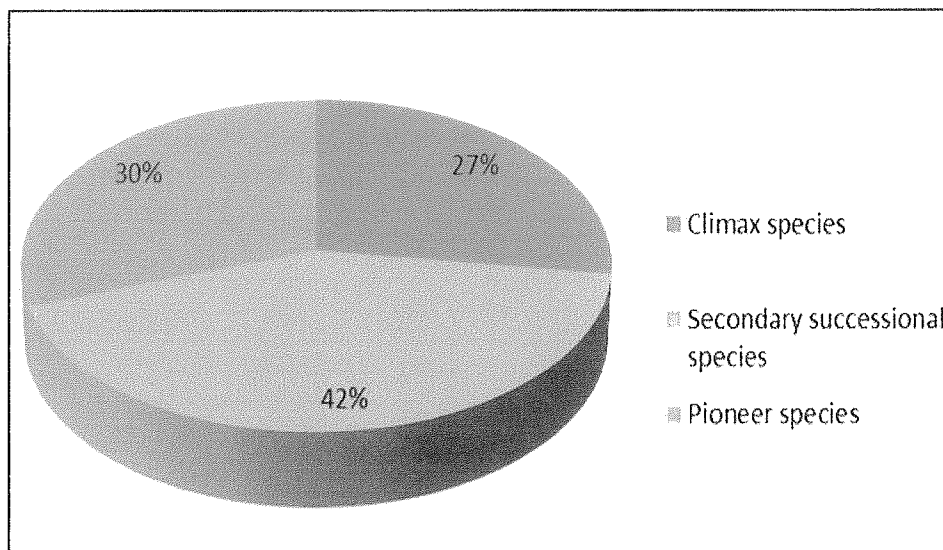


The *Acacia tortilis* woodland vegetation unit is located throughout the proposed route on game farms and open areas on red-yellow clayey soil.

The vegetation is dominated by the tree *Acacia tortilis* the shrub *Euclea undulata* with the grasses *Themeda triandra*, *Cynodon dactylon* and *Eragrostis rigidior* locally prominent.

The vegetation representative of this unit that are located within game farms has a higher species richness with a better grass and woody cover. The sections of this unit located on open / normal farm land are mostly encroached while some sections seem to have been affected due to bush clearing or previous agricultural activities. These activities have resulted in the increase of the *Acacia tortilis*, which is very invasive in old cleared agricultural and overgrazed fields, or have become encroached by the indigenous invader tree *Acacia mellifera* that has displaced the natural vegetation forming dense impenetrable thickets.

The degraded condition of the vegetation is reflected in the species composition with 30% of the species being pioneer and 42% secondary successional species indicating previous disturbance (Figure 6). This unit has a low species richness.



**Figure 6.** Species composition for the *Acacia tortilis* mixed woodland

### **Red data species**

No red data species were found within this vegetation unit and it is doubted whether any such species would be found due to the degraded condition of the unit.

The following is a list of species identified in the area:

#### **WOODY SPECIES**

Acacia karroo  
Acacia tortilis (Forssk.) Hayne  
Acacia mellifera  
Acacia nilotica  
Acacia erubescens  
Boscia foetida  
Clematis brachiata Thunb.  
Dicrostachys cinerea  
Euclea undulata  
Felicia muricata  
Maytenus heterophylla (Eckl. & Zeyh.) N. Robson  
Melia azedarach  
Rhus pyroides Burch.  
Terminalia sericea  
Ziziphus mucronata Willd.

#### **GRASSES**

Cenchrus ciliaris L.  
Cynodon dactylon (L.) Pers.  
Eragrostis gummifloa  
Eragrostis rigidior Pilg.  
Heteropogon contortus (L.) Roem. & Schult.  
Pogonarthria squarrosa  
Themeda trandra  
Tricholaena monachne

#### **FORBS**

Asparagus laricinus Burch.  
Cyperus pennisetoides  
Geigeria burkei  
Leonotis leonurus (L.) R.Br.  
Oldenlandia herbacea  
Opuntia ficus indica  
Senecio spp.  
Solanum incanum L.  
Tagetes minuta L.  
Waltheria indica