

The *Dichrostachys cinerea-Terminalia sericea woodland (unit 1)* 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. This vegetation unit is therefore from a plant ecological and ecosystem functioning point of view regarded as having a **low-medium conservation value** (Figure 9). A large section of the proposed powerline will pass through an existing powerline route near the Wolwekraal substation within this vegetation unit which will have a minimal impact on the vegetation.

The *Combretum apiculatum-Peltophorum africanum woodland (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 (Figure 9).

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 opportunistic *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** (Figure 9).

**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** (Figure 9).



**Figure 9.** Conservation status of the different vegetation units (Red = high; Orange = medium; Yellow = Low) (From Google Spot Image 2010).

**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** (Figure 9).

#### Threatened species

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 (Annexure 1).

### Medicinal species

A total of five (5) medicinal plants were identified in the study area and are listed in the table below:

Plant name	Plant part used	Medicinal use	Vegetation unit/s
<i>Acacia karroo</i>	Leaves, bark and gum	Diarrhoea & dysentery Gum: colds, oral thrush & haemorrhage.	1, 3, 4
<i>Aloe greatheadii</i>	Leaf sap	Treat skin irritations, bruises and burns.	1
<i>Euclea undulata</i>	Roots	Remedy for toothache and headache; heart diseases; anti-inflammatory	1, 2, 3
<i>Sclerocarya birrea</i>	Bark, roots, leaves	Diarrhoea & dysentery; fever treatment	2
<i>Ziziphus mucronata</i>	Roots, bark or leaves	Cough & chest problems; diarrhea; pain relief	1, 3, 4

Only five medicinal plants were observed during this study. All of these species are common species and none is currently threatened. However the protected tree *Sclerocarya birrea* (marula) must be protected as far as possible. If some of the other plants are lost during construction, it should not have any significant negative impact on the conservation status of this species or the ecosystem.

## ii. IMPACT EVALUATION

### Impact analysis

The construction of pylons will inevitably have an impact on the surrounding ecosystem. The severity of the impact, however, varies, depending on the nature of the activity and mitigation measures followed. Different impacts on the vegetation will be experienced during construction and operational phase. These impacts on the total ecosystem are analysed below according to their extent, duration, intensity and probability. Each of these criteria is given a rating in order to quantify the severity of the impact. For impact assessment the potential impacts on the vegetation was assessed by using the NEMA 2006 guidelines and criteria (Table 1) as described under the methods section of this report. The results are presented below:

#### Proposed Pylon Route (Effect On Site)

##### *Dichrostachys cinerea-Terminalia sericea* woodland – Unit 1

Impact	Extent	Duration	Intensity	Probability	Score	%
Loss of flora & habitat	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of rare species	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of medicinal plants	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Average score without mitigation					Low	27
Average score with mitigation					Low	27

##### *Combretum apiculatum-Peltophorum africanum* woodland – Unit 2

Impact	Extent	Duration	Intensity	Probability	Score	%
Loss of flora & habitat	1	4	2	4	11	73
With mitigation	1	3	1	3	8	53
Loss of rare species	1	3	1	1	6	40
With mitigation	1	2	1	1	5	33
Loss of medicinal plants	1	3	2	2	8	53
With mitigation	1	2	1	2	6	40
Average score without mitigation					Medium	55
Average score with mitigation					Low/med	43



Acacia tortilis woodland – Unit 3

Impact	Extent	Duration	Intensity	Probability	Score	%
Loss of flora & habitat	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of rare species	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of medicinal plants	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Average score without mitigation					Low	27
Average score with mitigation					Low	27

River vegetation – Unit 4

Impact	Extent	Duration	Intensity	Probability	Score	%
Loss of flora & habitat	1	2	2	3	8	53
With mitigation	1	1	1	2	5	33
Loss of rare species	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of medicinal plants	1	1	1	1	4	27
With mitigation	1	1	1	1	4	29
Average score without mitigation					Low/med	36
Average score with mitigation					Low	30

Agricultural lands – Unit 5

Impact	Extent	Duration	Intensity	Probability	Score	%
Loss of flora & habitat	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of rare species	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Loss of medicinal plants	1	1	1	1	4	27
With mitigation	1	1	1	1	4	27
Average score without mitigation					Low	27
Average score with mitigation					Low	27

**MOUTSE SUBSTATION SITES 1 & 2 (Effect on both the proposed sites will be similar)**

Impact -- Destruction of sensitive habitat & areas of high biodiversity		
Criteria	Rating before mitigation	Rating after mitigation
Extent	1	1
Duration	1	1
Intensity	1	1
Probability	2	2
33% = Low		33% = Low

From the impact evaluations none of the systems are highly sensitive should pylons be placed within them. Vegetation unit 2 and 4 would be the most sensitive with medium sensitivity analysis. All other units have medium-low or low scores. Although the impacts will have an effect on the vegetation, mitigation measures would minimise most of the expected impacts and lessen the effect on the environment to medium-low or low. The proposed Moutse substation sites are not on ecologically sensitive areas and the impacts on the natural vegetation and ecosystem is expected to be low.

### iii. SENSITIVITY ANALYSIS

#### Sensitivity analysis of vegetation units

A sensitivity analysis was done for the five vegetation units identified. This was achieved by evaluating the different vegetation units against a set of habitat criteria (Table 2). The results indicate that Units 2 and 4 are the most sensitive with all the others having a low sensitivity.

**Table 2.** Sensitivity analysis for the five vegetation units identified along the proposed power line routes (Single scores range between 1 and 10 (the higher the score the more important the criterion) (red = high; orange medium; yellow = low-medium; light yellow = low/none).

	<b>Unit 1</b>	<b>Unit2</b>	<b>Unit 3</b>	<b>Unit 4</b>	<b>Unit 5</b>
<b>Criteria</b>	<i>Dichrostachys cinerea-Terminalia sericea woodland</i>	<i>Combretum apiculatum-Peltophorum africanum woodland</i>	<i>Acacia tortilis woodland</i>	River vegetation	Agricultural lands
Presence of protected / red data species	2	7	4	5	1
Species richness and composition	4	6	3	6	1
Dominant/prominent species ecological status	3	6	3	7	1
Sensitivity to disturbance	2	5	1	8	1
Conservation status and ecological functioning	3	7	3	8	1
Area fragmentation	3	7	3	7	1
Medicinal plants	2	5	1	4	1
Important topographical features (steep slopes, cliffs etc.)	2	4	1	8	1
<b>TOTAL SCORE</b>	<b>26</b>	<b>59</b>	<b>24</b>	<b>53</b>	<b>8</b>
<b>Sensitivity rating</b>	Low	Medium	Low	Medium	Low

## CONCLUSION

Any development will have a negative effect on the natural ecosystem in particular the vegetation thereof. The vegetation of areas where development and building of structures will take place will destroy all vegetation present on the specific area where a structure is planned to be erected. Due to the effect of soil tillage and the complete removal of indigenous vegetation these areas will be totally transformed or destroyed. The effect on the ecosystem and surrounding areas will depend on the planned development activity.

The purpose of any impact assessment is to determine areas of high sensitivity and to provide guidelines to ensure that the proposed development is ecologically sensitive and to prevent unnecessary destruction of natural ecosystems. It is mostly unavoidable to prevent all development especially power lines to cross and affect sensitive areas. It is therefore important that all possibilities for such power lines are investigated in order to provide ecologically sound recommendations on routes to be followed.

This study investigated the vegetation found along the route for the proposed construction of the approximately 40 km 132 kV Powerline from Wolvekraal Substation to and including the new Moutse Substation known as the Eskom Marble Hall NDP Project : The route investigated is from a plant ecological point of view not exceptionally sensitive. The conservation status of vegetation unit 4 (River) is regarded as high not from a plant ecological point of view but from its ecosystem functioning as a water body. All other vegetation units except unit 2 were found to be of a low conservation value with low sensitivity.

Vegetation unit 2 is similar to the natural vegetation of the least threatened SVcb16 Western Sandy Bushveld (Mucina & Rutherford, 2006). The placement of the pylons should therefore not have a negative effect on the ecosystem since they will be placed in an existing firebreak areas. Care should however be taken not to damage or remove the protected trees *Scierocarya birrea* and *Spirostachys africanus* present in this unit. It is especially the former that has single large individuals close to the fence line of the reserve in the west

In conclusion, the proposed route and substation are from a plant ecological, ecosystem functioning and habitat perspective regarded as having a low sensitivity. If proper mitigation measures are put in place the route should have little impact on the natural environment and its ecosystem functioning. It is not foreseen that the construction of the power lines would have a significant negative effect on the environment.

*Proposed substation site*

The proposed Moutse substation sites are located within degraded vegetation (old agricultural fields) with a low conservation values. The vegetation on the proposed site will be destroyed, but it should have no negative effect on the natural vegetation which is mostly transformed due to agricultural activities.

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## POSSIBLE RED DATA SPECIES

The information contained on this Annexure is confidential and may not be made available for public perusal

Genus	Species	Comment	National Status
Acacia	erioloba	Habitat not suitable	Declining
Acacia	ormocarpoides	Habitat not suitable	NT
Acacia	sekhukhuniensis	Habitat not suitable	CR
Adenia	fruticosa	Habitat not suitable	NT
Adenia	fruticosa	Habitat not suitable	Rare
Adenia	gummifera	Habitat not suitable	Declining
Alepidea	amatymbica	Habitat not suitable	VU
Alepidea	attenuata	Habitat not suitable	NT
Aloe	cooperi	Habitat not suitable	Declining
Aloe	hardyi	Habitat not suitable	Rare
Aloe	monotropa	Habitat not suitable	VU
Aloe	soutpansbergensis	Habitat not suitable	Rare
Aneilema	longirrhizum	Habitat not suitable	NT
Ansellia	africana	Habitat not suitable	Declining
Argyrobium	muddii	Habitat not suitable	EN
Crassula	setulosa	Habitat not suitable	VU
Asparagus	fourci	Habitat not suitable	VU
Asparagus	sekukuniensis	Habitat not suitable	EN
Asparagus	sp. nov. 'elephantinus'	Habitat not suitable	Rare
Asparagus	sp. nov. 'hirsutus' S.M. Burrows	Habitat not suitable	VU
Aster	nubimontis	Habitat not suitable	EN
Blepharis	uniflora	Habitat not suitable	Rare
Boophone	disticha	Habitat not suitable	Declining
Bowiea	volubilis	Habitat marginal but VU in reserve only	VU
Brachycorythis	conica	Habitat not suitable	VU
Brachystelma	villosum	Habitat not suitable	Rare
Brackenridgea	zanguebarica	Habitat not suitable	CR
Buchnera	remotiflora	Habitat not suitable	DD
Callilepis	leptophylla	Habitat not suitable	Declining
Cassipourea	malosana	Habitat not suitable	Declining
Ceratotheca	saxicola	Habitat not suitable	Rare
Ceropegia	cimiciodora	Habitat not suitable	VU
Ceropegia	turricula	Habitat not suitable	NT
Chlorophytum	radula	Habitat not suitable	CR
Christella	altissima	Habitat not suitable	DD
Combretum	petrophilum	Habitat not suitable	Rare
Commelina	rogersii	Habitat not suitable	VU
Crassula	cymbiformis	Habitat not suitable	Critically Rare

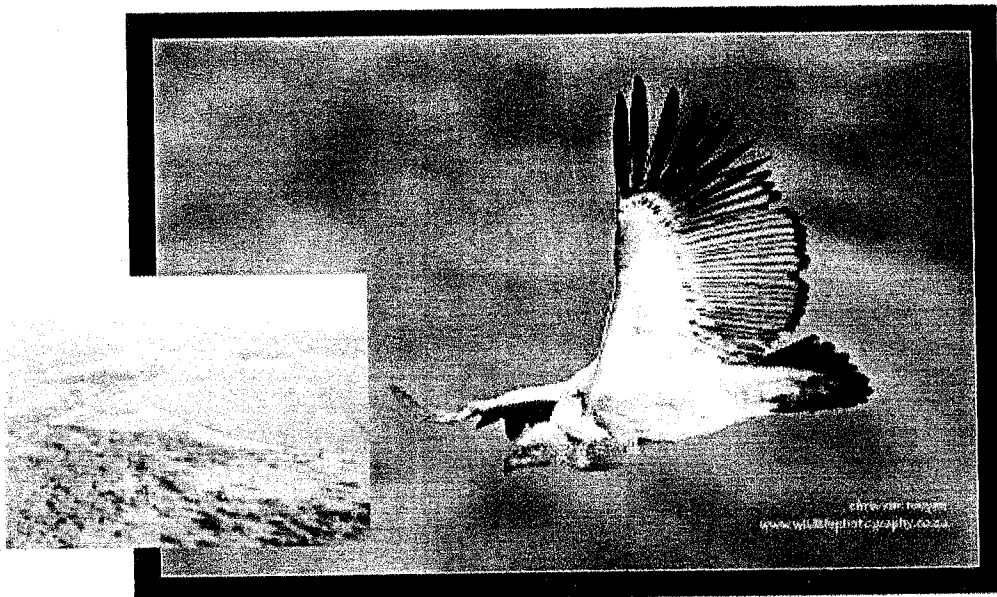
Crinum	stuhmannii	Habitat not suitable	Declining
Cryptocarya	transvaalensis	Habitat not suitable	Declining
Cucumis	humifructus	Habitat not suitable	VU
Cullen	bolubii	Habitat not suitable	VU
Cyphostemma	hardyi	Habitat not suitable	VU
Cyrtanthus	junodii	Habitat not suitable	VU
Dicliptera	fionae	Habitat not suitable	Critically Rare
Dicoma	montana	Habitat not suitable	Rare
Dicoma	prostrata	Habitat not suitable	DD
Dioscorea	sylvatica	Habitat not suitable	VU
Diplolophium	buchananii	Habitat not suitable	VU
Disa	aristata	Habitat not suitable	VU
Dracaena	transvaalensis	Habitat not suitable	Rare
Drimia	altissima	Habitat not suitable	Declining
Elaeodendron	transvaalense	Habitat not suitable	NT
Encephalartos	cupidus	Habitat not suitable	CR
Encephalartos	dolomiticus	Habitat not suitable	CR
Encephalartos	dyerianus	Habitat not suitable	CR
Encephalartos	eugene-maraisii	Habitat not suitable	EN
Encephalartos	hirsutus	Habitat not suitable	CR
Encephalartos	inopinus	Habitat not suitable	CR
Encephalartos	laevifolius	Habitat not suitable	CR
Encephalartos	lanatus	Habitat not suitable	VU
Encephalartos	nubimontanus	Habitat not suitable	EW
Eulalia	aurea	Habitat not suitable	NT*
Eulophia	speciosa	Habitat not suitable	Declining
Euphorbia	barnardii	Habitat not suitable	EN
Euphorbia	bayeri	Habitat not suitable	CR
Euphorbia	sekukuniensis	Habitat not suitable	Rare
Euphorbia	waterbergensis	Habitat not suitable	Rare
Euphorbia	zoutpansbergensis	Habitat not suitable	Rare
Gasteria	batesiana	Habitat not suitable	NT
Gasteria	batesiana	Habitat not suitable	Critically Rare
Gladiolus	dolomiticus	Habitat not suitable	Rare
Gunnera	perpensa	Habitat not suitable	Declining
Justicia	montis-salinarum	Habitat not suitable	Rare
Kalanchoe	crundallii	Habitat not suitable	Rare
Kniphofia	crassifolia	Habitat not suitable	CR
Nesaea	alata	Habitat not suitable	Rare
Ophioglossum	gracillimum	Habitat not suitable	EN
Pavetta	tshikondeni	Habitat not suitable	Rare
Plectranthus	esculentus	Habitat not suitable	DD
Plectranthus	porcatus	Habitat not suitable	VU
Plectranthus	venteri	Habitat not suitable	Rare
Rhoicissus	laetans	Habitat not suitable	Rare
Senecio	hederiformis	Habitat not suitable	Rare
Siphonochilus	aethiopicus	Habitat not suitable	CR
Warburgia	salutaris	Habitat not suitable	EN
Woodia	singularis	Habitat not suitable	Rare
Zantedeschia	jucunda	Habitat not suitable	VU



Bird Impact Assessment Report: Proposed Wolwekraal – Moutse 132kV

# Bird Impact Assessment Report

## Marble Hall NDP Project



## Potential bird impacts of a proposed Wolwekraal – Moutse 132kV

July 2011

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## EXECUTIVE SUMMARY

Eskom, the proponent in this study, has identified the need for a new 132kV distribution line between Wolwekraal substation and a new proposed Moutse Substation in Limpopo. The proposed project consists of approximately 42km of 132 kV power line from Wolwekraal Substation to and including the new Moutse Substation. The potential impacts of the new power line on avifauna are:

- Electrocution
- Collision
- Habitat destruction

### ELECTROCUTION

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.

**Recommendation:** The 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

### 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.

**Recommendation:** 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 (see Appendix B Sensitivity map for the area to be marked with Bird Flight Diverters).

### HABITAT DESTRUCTION

Both the sites of the proposed Moutse Substation is situated in degraded woodland see (Appendix A). 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

## Bird Impact Assessment Report: Proposed Wolwekraal – Moutse 132kV

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**.

**Recommendation:** No specific recommendations are put forward as far as the potential avifaunal impact of habitat destruction is concerned, other than strict adherence to Eskom's standard EMP requirements for construction and maintenance of distribution power lines. **If at all possible, the removal of large trees should be avoided.**

### **PREFERRED ALIGNMENT**

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

## 1 Introduction

Eskom, the proponent in this study, has identified the need for a new 132kV distribution line between Wolwekraal substation and a new proposed Moutse Substation in Limpopo. The proposed project consists of approximately 42km of 132 kV power line from Wolwekraal Substation to and including the new Moutse Substation.

The environmental impact process requires the investigation of the potential impact that the new proposed line could have on birds. Chris van Rooyen Consulting was appointed by Landscape Dynamics (who is conducting the environmental impact investigations) to conduct the bird impact assessment study. Figure 1 below shows the study area with the proposed alignments.

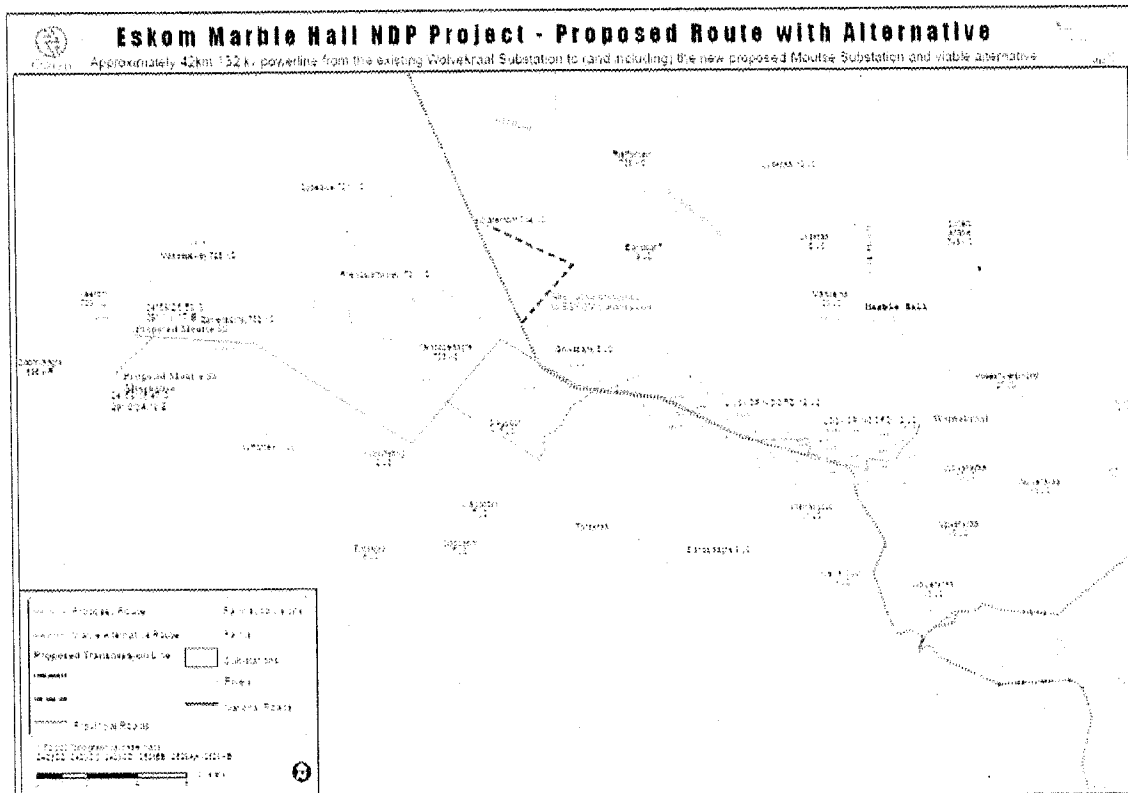


Figure 1: Proposed alignments for Wolwekraal-Moutse 132kV.



Figure 2: Satellite image of the proposed alignments (purple = alternative 1; orange = alternative 2)

## 2 Terms of reference

The scope for the report is as follows:

- provide a description of the study area pertaining to the specialist study;
- identify concerns and potential impacts;
- highlight sensitive and possible 'no-go' areas;
- identify a preferred alignment;
- provide an evaluation of the envisaged impacts on sensitive avifauna, and
- provide recommendations for the envisaged impacts.

## 3 Sources of information

The following information sources were consulted in order to conduct this study:

- Bird distribution data of the Southern African Bird Atlas Project (SABAP1 – Harrison et al, 1997) were obtained from the SANBI website (<http://www.birds.sanbi.org>) for the Quarter-Degree Grid Cells (QDGCs) traversed by the proposed line namely 2429CC and 2529AA.
- The more recent SABAP2 project was also consulted, and species lists for the relevant QDGCs were consulted. This data is much more recent, as SABAP2 was only launched in May 2007, and should therefore be more accurate. For SABAP1, QDGCs were the geographical sampling units. QDGCs are grid cells that cover 15 minutes of latitude by 15 minutes of longitude (15. × 15.), which correspond to the area shown on a 1:50 000 map. For SABAP2 the sampling unit has been reduced to pentad grid cells (or pentads); these cover 5 minutes of latitude by 5 minutes of longitude (5. × 5.). Each pentad is approximately 8 × 7.6 km. This finer scale has been selected for SABAP2 to obtain more detailed information on the occurrence of species and to give a clearer and better understanding of bird distributions.

- The conservation status of all bird species occurring in the aforementioned QDGC and pentads was determined as per the most recent iteration of the southern African Red Data list for birds (Barnes 2000), and the most recent and comprehensive summary of southern African bird biology (Hockey et al, 2005).
- The power line bird mortality incident database of the Eskom - Endangered Wildlife Trust Strategic Partnership (1996 to 2007) was consulted to determine which of the species occurring in the study area are typically impacted upon by power lines and the extent to which they are impacted on.
- A classification of the vegetation types in the QDGCs was obtained from Harrison et al, (1997).
- Information on the bird micro habitat level was obtained through visiting the area and obtaining a first-hand perspective.

#### **4 Assumptions & Limitations**

This study made the assumption that the above sources of information are adequately reliable. However, the following factors may potentially detract from the accuracy of the predicted results:

- The SABAP1 data covers the period 1986-1997. Bird distribution patterns fluctuate continuously according to availability of food and nesting substrate.
- Sources of error in the SABAP1 database, particularly inadequate coverage of some quarter degree squares. This means that the reporting rates of species, may not be an accurate reflection of the true densities in quarter degree squares that were sparsely covered during the data collecting period (for a full discussion of potential inaccuracies in SABAP1 data, see Harrison *et al*, 1997). It must be noted that in this instance the QDGCs have not been well covered with data being recorded in only 26 checklists for 2429CC and 27 checklists for 2529AA. The coverage by SABAP2 project has also not been extensive, with a total of 14 checklists for 2429CC and 12 checklist or 2529AA which give an updated, if incomplete snapshot of the birds currently occurring there. In view of this, the reporting rates for the species in the study area are regarded as only a guideline, and not reflecting true densities on the ground.
- Predictions in this study are based on experience of these and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will hold true under all circumstances. However, power line and substation impacts can be predicted with a fair amount of certainty, based on experience gained by the author through the investigation of hundreds of localities in southern Africa, since 1996, where birds have interacted electrical infrastructure.

#### **5 Description of the receiving environment**

The study area falls primarily within the 2429CC and 2529AA QDGCs. According to the Atlas of Southern African Bird (Harrison *et al* 1997), the natural habitat in 2429CC QDGC consists of 42% Arid Woodland and 58% Moist Woodland. In 2529AA 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 (Harrison *et al* 1997). The description of the vegetation types occurring in the study area makes use of classification system presented in the Atlas of southern African birds (Harrison *et al*, 1997). The criteria used to amalgamate botanically defined vegetation units, or to keep them separate were (1) the existence of clear differences in vegetation

structure, likely to be relevant to birds, and (2) the results of published community studies on bird/vegetation associations. It is important to note that no new vegetation unit boundaries were created, with use being made only of previously published data. The description of vegetation presented in this study therefore concentrates on factors relevant to the bird species present, and is not an exhaustive list of plant species present.

**The original natural vegetation in the study area consisted mostly of woodland (or savanna).**

Woodland is defined as having a grassy under-storey and a distinct woody upper-storey of trees and tall shrubs (Harrison *et al* 1997). Soil types are varied but are generally nutrient poor. The savanna biome contains a large variety of bird species (it is the most species-rich community in southern Africa) but very few bird species are restricted to this biome. It is also relatively well conserved compared to the grassland biome. The savanna biome is particularly rich in large raptors, and 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 (Gymnogone) *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*.

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, and can largely only be identified through a combination of field investigation and experience. 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. In the study area, the natural habitat has been extensively transformed with agricultural fields replacing large portions of the original woodland. The following important bird micro-habitats were identified during the site visit:

- **Woodland:** It is likely that many of the woodland associated species mentioned in the preceding paragraphs still occur in the immediate study area from time to time (see also Table 1). The woodland is relatively intact, although quite fragmented by agricultural activity and urban development. The satellite image of the study area in Figure 2 above gives an indication of the extent of agricultural and urban development (and subsequent fragmentation of natural woodland) that has taken place in the study area.
- **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 (see Figure 2) 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 power line 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 power line sensitive Red Data species – Secretarybirds (Red Data status near threatened) often utilize 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:** Many thousands of earthen and other dams exist in the southern African landscape. 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* and many of the large raptor species, which need exposed shorelines to bath and drink (See Figure 2 and Appendix A).
- **Wetlands and drainage lines:** The prominent river that occurs within the immediate study area is the Elands River. It is noted that 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 (see Figure 2 and Appendix A). 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 study area contains a few wetlands, which are mostly associated with the Elands River and its tributaries. 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.

Appendix A provides a visual record of the micro-habitats in the study area.



## 6 Birds in the study area

TABLE 1 below shows the reporting rates for the Red Data species that have been recorded in 2429CC and 2529AA by the SABAP1 and SABAB2 projects in which the study area is situated (Harrison *et al* 1997; (<http://www.birds.sanbi.org>)). It is important to note that these species could have been recorded anywhere in suitable habitat within each square, not necessarily in this study area itself. Reporting rates are essentially the number of times a species was recorded in a QDGC as a percentage of the number of times that QDGC was counted. Due to the small amount of checklists completed for the QDGCs, the numbers are only taken as a guideline.

**Table 1.** SABAP1 and 2 Red Data species reporting rates for 2429CC and 2529AA.

Species	Conservation status	2429CC Reporting rate SABAP1	2429CC Reporting rate SABAP2	2529AA Reporting rate SABAP1	2529AA Reporting rate SABAP2	Habitat requirements (Barnes 2000; Hockey <i>et al</i> , 2005; Harrison <i>et al</i> , 1997; personal observations)	Likelihood of negative interaction with the proposed power lines
Secretarybird <i>Sagittarius serpentarius</i>	Near threatened	53.8	7.1	3.7	-	Grassland, old lands, open woodland.	Medium
Cape Vulture <i>Gyps coprotheres</i>	Vulnerable	19.2	-	-	-	Large cliffs for breeding and roosting, open woodland and grassland. Roosts on transmission lines.	Medium
Lanner Falcon <i>Falco biarmicus</i>	Near threatened	-	14.3	-	-	Generally prefers open habitat, but exploits a wide range of habitats. Will nest in wooded areas if suitable cliffs or transmission structures are present.	Low
Lesser Kestrel <i>Falco naumanni</i>	Vulnerable	3.8	21.4	-	-	Grasslands, old lands, cultivated lands.	Low
African Grass-Owl <i>Tyto capensis</i>	Vulnerable	11.5	-	-	-	Normally associated with pristine, well managed grasslands usually in close proximity of water, but also in alien vegetation structurally resembling tall grass.	Low
Black Stork <i>Ciconia nigra</i>	Near threatened	-	-	3.7	-	Rivers, dams, cliffs. Could be a visitor to the dams and wetlands. Sometimes roost on power lines	Medium
White-backed Vulture <i>Gyps africanus</i>	Vulnerable	7.7	14.3	-	-	Woodland	Medium
African Marsh Harrier <i>Circus ranivorus</i>	Vulnerable	15.4	-	-	-	Large permanent wetlands with dense reed beds. Sometimes forages over smaller wetlands and grassland.	Low
Denham's Bustard <i>Neotis denhami</i>	Vulnerable	3.8	-	-	-	Primarily a grassland species, where it favours high rainfall, sour grassland. Could utilise old lands reverting to grassland.	Low

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Red-billed Oxpecker <i>Buphagus</i> <i>erythrorhynchus</i>	Near threatened	3.8	14.3	-	-	Savanna woodland and bushveld with large ungulates.	Negligible
White-bellied Korhaan <i>Eupodotis</i> <i>senegalensis</i>	Vulnerable	-	-	7.4	-	Relatively tall grassland. Often in the interface between grassland and savanna. Avoids severely grazed and recently burnt sites.	Medium
Pallid Harrier <i>Circus macrourus</i>	Near threatened	-	14.3	-	-	Grassland and cultivated fields to a lesser extent.	Low

Although about 50% fewer checklists have been completed for the SABAP2 project than for the QDGCs in the SABAP1 project (53 vs 26), it is notable that a decade later, most of the Red Data species recorded by SABAP1 have not been recorded again. It is not immediately apparent why there is a general decrease in reported densities for most Red Data species, as the land use and habitat have not undergone obvious dramatic changes in the last decade. It is possible though that the extent of urbanisation has increased over the past decade. However, it may well be that the difference in reporting rate reflects the difference in sample sizes rather than an actual decrease in densities.

An interesting exception to the general decrease in reporting rates for Red Data species is the White-backed Vulture, which shows an increase in reporting rates from 7.7% to 14.3% from SABAP1 to SABAP2 for 2429CC. This seems to indicate that there is a ready supply of carrion in the study area, which may also be a reflection of livestock numbers in the area. Somewhat inexplicably though, Cape Vultures have dropped from 19.2% to 0.

There are extensive areas of remaining natural woodland in the study area. The woodland areas are important for raptors in general, including Red Data species such as White-backed Vulture. The open areas in between the woodland, especially old lands, are important foraging areas for Secretarybirds and Lanner Falcons. Denham's Bustard was recorded in 2429CC by SABAP1, and it is possible that a few individuals remain in the area. It is however primarily a grassland species, and the habitat is therefore rather marginal in the study area.

## **7 Potential impacts of the proposed power line and proposed mitigation measures**

Because of their size and prominence, electrical infrastructures constitute an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are electrocution of birds and other animals and birds colliding with power lines. (Ledger & Annegarn 1981; Ledger 1983; Ledger 1984; Hobbs & Ledger 1986a; Hobbs & Ledger 1986b; Ledger *et al*, 1992; Verdoorn 1996; Kruger & Van Rooyen 1998; Van Rooyen 1998; Kruger 1999; Van Rooyen 1999; Van Rooyen 2000, Anderson 2001). Other problems are electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure (Van Rooyen *et al*, 2002), and disturbance and habitat destruction during construction and maintenance activities.

### **7.1 Electrocutions**

Large birds of prey are the most commonly electrocuted on power lines, but the larger power lines from 220kV to the massive 765kV structures are usually not a threat to large raptors, because the pylons are designed in such a manner that the birds do not perch in close proximity the potentially lethal conductors. In fact, these power lines have proved to be beneficial to birds such as Martial Eagles *Polemaetus bellicosus*, Tawny Eagles *Aquila rapax*, White-backed Vultures and even occasionally Verreauxs' Eagles *Aquila verreauxii* by providing safe nesting and roosting sites in areas where suitable natural alternatives are scarce (pers.obs). Cape Vultures have also taken to roosting on power lines in certain areas in large numbers, while Lappet-faced Vultures *Torgos tracheliotis* are increasingly using power lines as roosts, especially in the Northern Cape (pers.obs.).

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A mono-pole steel pole will be used for the new 132kV line. Clearance between phases on the same side of the pole structure is normally around 2.2m for this type of design, and the clearance on strain structures is 1.8m. This clearance should be sufficient to prevent phase – phase electrocutions of birds on the towers. The length of the stand-off insulators is likely to be about 1.5 metres. This is relevant as birds, particularly vultures, are able to touch both the conductor and the earthed pole simultaneously potentially resulting in a phase – earth electrocution. This is particularly likely when more than one bird sits on the same pole.

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.

**Recommendation:** The 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 (see figure 3 below).

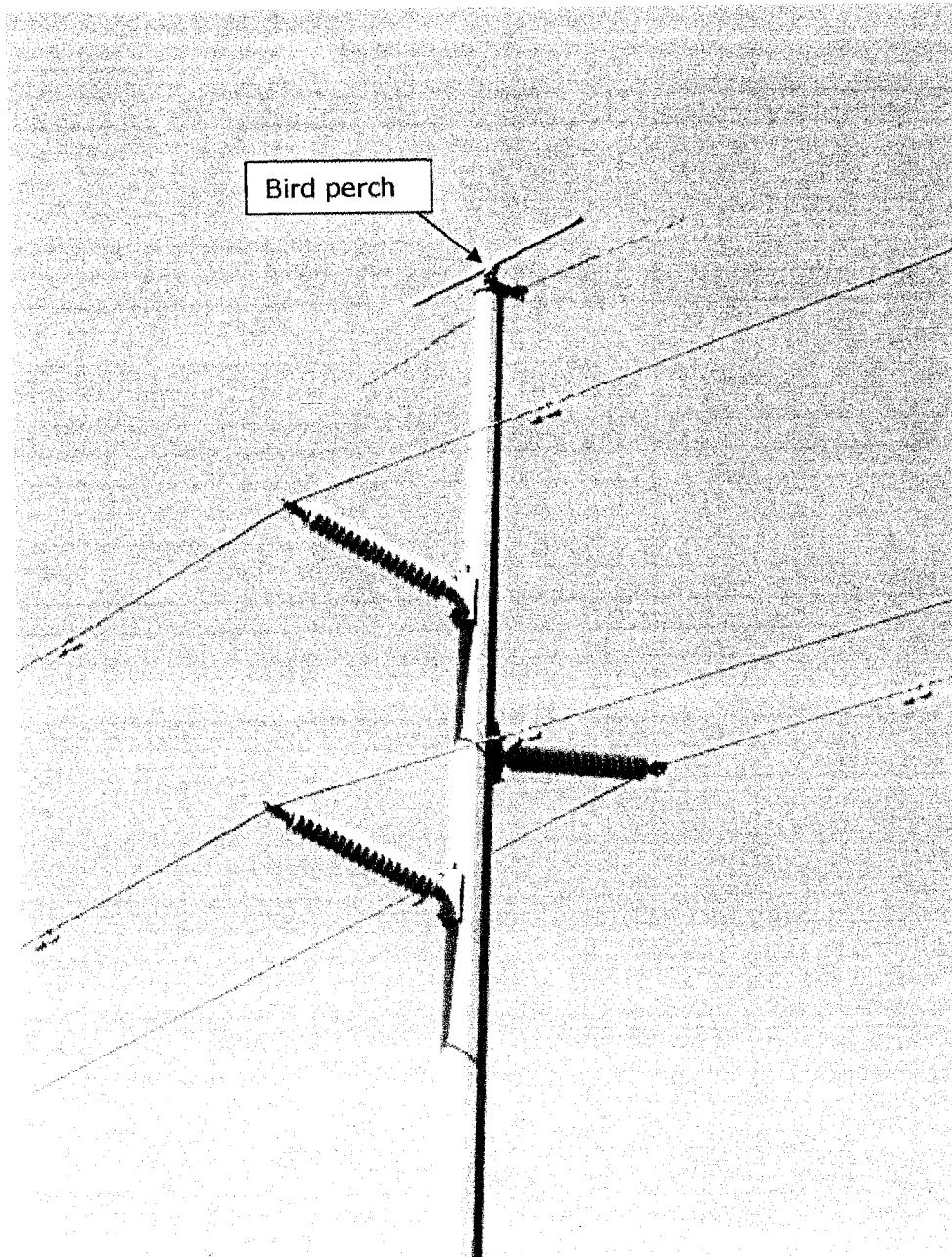


Figure 3: Single steel pole with bird perch fitted

## 7.2 Collisions

Anderson (2001) summarizes collisions as a source of avian mortality as follows:

“The collision of large terrestrial birds with the wires of utility structures, and especially power lines, has been determined to be one of the most important mortality factors for this group of birds in South Africa (Herholdt 1988; Johnsgard 1991; Allan 1997). It is possible that the populations of two southern African endemic bird species, the Ludwig’s Bustard *Neotis ludwigii* and Blue Crane *Anthropoides paradiseus*, may be in decline because of this single mortality factor (Anderson 2000; McCann 2000). The Ludwig’s Bustard (Anderson 2000) and Blue

Crane (McCann 2000) are both listed as "vulnerable" in The Eskom Red Data Book of Birds of South Africa, Lesotho & Swaziland (Barnes 2000) and it has been suggested that power line collisions is one of the factors which is responsible for these birds' present precarious conservation status

Collisions with power lines and especially overhead earth-wires have been documented as a source of mortality for a large number of avian species (e.g. Beaulaurier et al, 1982; Bevanger 1994, 1998). In southern Africa, this problem has until recently received only limited attention. Several studies however have identified bird collisions with power lines as a potentially important mortality factor (for example, Brown & Lawson 1989; Longridge 1989). Ledger *et al*, (1993), Ledger (1994) and Van Rooyen & Ledger (1999) have provided overviews of bird interactions with power lines in South Africa. Bird collisions in this country have been mainly limited to Greater and Lesser Flamingos, various species of waterbirds (ducks, geese, and waders), Stanley's *Neotis denhami* and Ludwig's Bustards, White Storks *Ciconia ciconia*, and Wattled *Grus carunculatus*, Grey Crowned *Balearica regulorum* and Blue Cranes (for example, Jarvis 1974; Johnson 1984; Hobbs 1987; Longridge 1989; Van Rooyen & Ledger (1999)). Certain groups of birds are more susceptible to collisions, namely the species which are slow fliers and which have limited maneuverability (as a result of high wing loading) (Bevanger 1994). Birds which regularly fly between roosting and feeding grounds, undertake regular migratory or nomadic movements, fly in flocks, or fly during low-light conditions are also vulnerable. Other factors which can influence collision frequency include the age of the bird (younger birds are less experienced fliers), weather factors (decreased visibility, strong winds, etc.), terrain characteristics and power line placement (lines that cross the flight paths of birds), power line configuration (the larger structures are more hazardous [for collisions, with electrocutions the opposite is the case]), human activity (which may cause birds to panic and fly into the overhead lines), and familiarity of the birds with the area (therefore nomadic Ludwig's Bustards would be more susceptible) (Anderson 1978; APLIC 1994).

Although collision mortality rarely affects healthy populations with good reproductive success, collisions can be biologically significant to local populations (Beer & Ogilvie 1972) and endangered species (Thompson 1978; Faanes 1987). The loss of hundreds of Northern Black Korhaans *Eupodotis afraoides* due to power line collisions would probably not affect the success of the total population of this species and would probably not be biologically significant, but if one Wattled Crane was killed due to a collision, that event could have an effect on the population that would be considered biologically significant. Biological significance is an important factor that should be considered when prioritising mitigation measures. Biological significance is the effect of collision mortality upon a bird population's ability to sustain or increase its numbers locally and throughout the range of the species."

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.

**Recommendation:** 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 (see Appendix B Sensitivity map for the area to be marked with Bird Flight Diverters).

### 7.3 Habitat destruction

During the construction phase and maintenance of power lines, some habitat destruction and alteration inevitably takes place. This happens with the construction of access roads, and the clearing of servitudes. Servitudes have to be cleared of excess vegetation at regular intervals in order to allow access to the line for maintenance, to prevent vegetation from intruding into the legally prescribed clearance gap between the ground and the conductors and to minimize the risk of fire under the line which can result in electrical flashovers. These activities could have an impact on birds breeding, foraging and roosting in or in close proximity of the servitude, through destruction of habitat. Historically (i.e. before the establishment of the current settlements) the area surrounding the proposed power line comprised entirely of undisturbed woodland. As a result it may have supported a number of power line sensitive species, particularly raptor species currently Red Data listed such as Martial Eagle, Tawny Eagle, Lappet-faced Vulture and also non-raptors such as Southern Ground Hornbill *Bucorvus leadbeateri* and Kori Bustard. However this area has long been transformed to accommodate a change in land use (i.e. agriculture and human settlements) which reduced the number and variety of species originally inhabiting the area, on account of the loss of habitat and decline in food availability. However, because relatively undisturbed areas of woodland still remain, it is likely that many of the remaining Red Data species will still utilize the area from time to time. **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 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 is situated in degraded woodland see (Appendix A). 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.

**Recommendation:** 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. **If at all possible, the removal of large trees should be avoided.**



#### 7.4 Disturbance

The construction of a power line can be highly disturbing to birds breeding in the vicinity of the construction activities. Many birds are highly susceptible to disturbance, and should this disturbance take place during a critical time in the breeding cycle, for example when the eggs have not hatched or just prior to the chick fledging, it could lead to temporary or permanent abandonment of the nest or premature fledging. In both instances, the consequences are almost invariably fatal for the eggs or the fledgling. Such a sequence of events can have far reaching implications for certain large, rare species that only breed once a year or once every two years.

As is the case with habitat destruction, the potential for the disturbance of breeding birds caused by the construction of new power lines is limited due to the extensive impacts that are already evident in the area, particularly intensive agriculture and urbanization. The most sensitive habitat is the remaining woodland areas, especially for raptors. The risk of disturbance is therefore regarded as **LOW**.

**Recommendation:** 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 of transmission power lines.

### 8 Identifying a preferred alignment

One of the objectives of this study is to arrive at a preferred corridor for the proposed power line in terms of impacts on avifauna. The following factors were incorporated in the formula to arrive at a preferred corridor, using high resolution Google Earth imagery and observations on the ground as the main sources of data:

- 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 namely 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 (APLIC 1994; Sundar & Choudhury 2005). 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 power line 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.

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- 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 power line sensitive Red Data using this habitat.
- Old lands: This habitat may attract species such as Secretarybird 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 each corridor. The formula was designed as follows:

- Wetlands and dams: The length of alignment running within 250m of a dam or wetland was measured.
- The number of drainage lines crossed by each alignment was counted.
- The distance that the proposed alignments are running directly next to existing transmission lines was measured.
- The distance that the proposed alignments are running parallel to existing major roads within a 250m zone was measured.
- The length of line running through or within 1km of settlements/urban/industrial activity was measured.
- The length of alignment skirting or running across agricultural lands was measured.
- The length of alignment skirting or running across old lands was measured.

**Table 2:** The results of the measurements for each option in km.

<b>Factor</b>	<b>Alternative alignment 1</b>	<b>Alternative alignment 2</b>
Dams and wetlands	0.26	2.5
Drainage lines (number)	2	3
TX lines	2.09	2.09
Roads	0.58	0.58
Suburban	1.58	0
Agriculture	6.65	5.91
Old lands	1.85	2.88

Obviously all these factors do not have an equal impact on the size of the risk, therefore a weighting was assigned to each factor, based on this author's judgment on how important the factor is within the total equation.

The following weights were assigned. Risk reducing factors were assigned a negative weight:

**Table 3:** Weights assigned to risk factors

Factor	Weighting
Dams/wetlands	4
Drainage lines	3
TX lines	-1
Roads	-2
Suburban/industrial	-5
Agriculture	-3
Old lands	2

The final risk score for a **factor** was calculated as follows: measurements/counts x weighting. The final risk rating for an **alignment** was calculated as the sum of the risk scores of the individual factors:

**Table 4:** The final scores for the respective options

Factor	Alternative alignment 1	Alternative alignment 2
Dams/wetlands	1.04	10
Drainage lines	6	9
TX lines	-2.09	-2.09
Roads	-1.16	0.58
Suburban/industrial	1.58	0
Agriculture	-19.95	-17.73
Old lands	3.7	5.76
<b>Total</b>	<b>-10.88</b>	<b>5.52</b>

From the analysis above it is clear that **alternative 1 is the preferred alternative from a bird impact perspective.**

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APPENDIX A: BIRD HABITAT

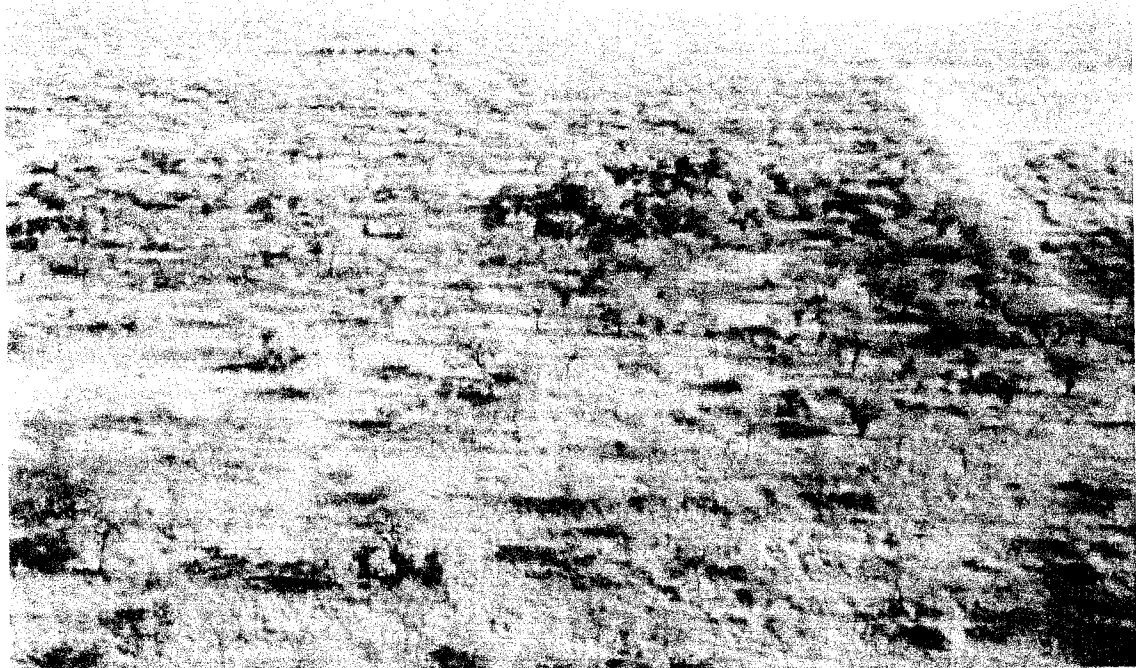


Figure 1: Typical woodland



Figure 2: Urban developments



Figure 3: Cleared old lands



Figure 4: Irrigated agriculture

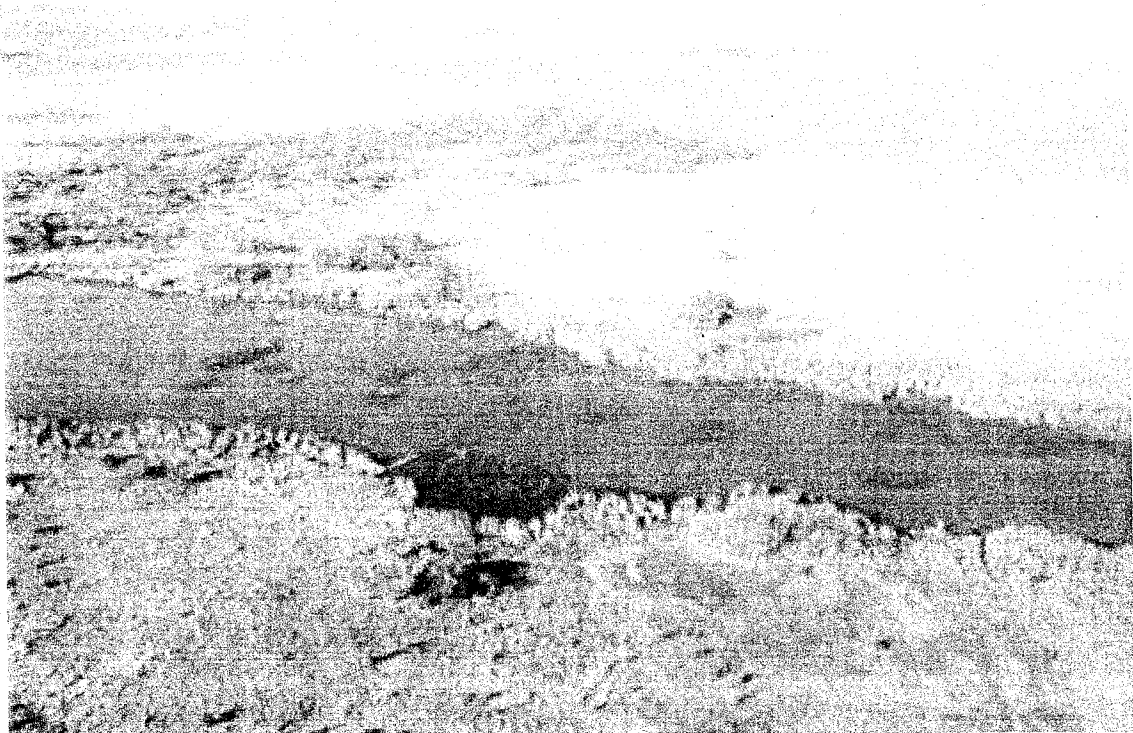


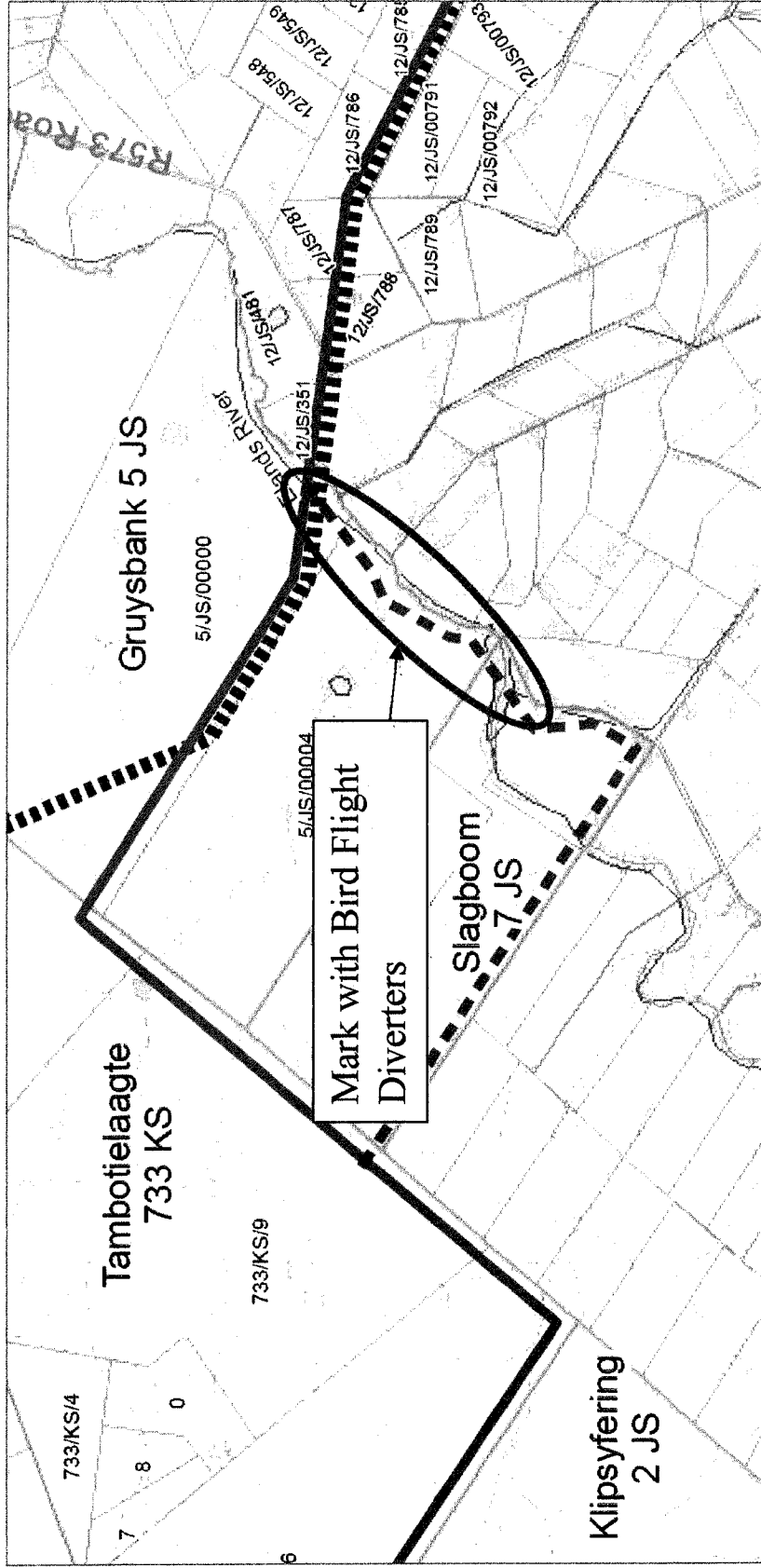
Figure 5: Dam in the Elands River



Figure 6: Drainage line



APPENDIX B: SENSITIVITY MAPS





Archaetnos Culture & Cultural  
Resource Consultants  
BK 98 09854/23

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**A REPORT ON THE CULTURAL HERITAGE ASPECTS FOR A BASIC  
ASSESSMENT FOR THE MARBLE HALL NDP PROJECT: THE PROPOSED  
CONSTRUCTION OF A 42 KM, 132 kV POWER LINE FROM WOLVENKRAAL  
SUBSTATION TO THE NEW MOUTSE SUBSTATION, LIMPOPO PROVINCE**

For:

*Landscape Dynamics Environmental Consultants*

REPORT: AE1161

By:

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*June 2011*

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**DECLARATION OF INDEPENDENCE AND SIGNING OFF**

I, Anton Carl van Vollenhoven from Archaetnos, hereby declare that I am an independent specialist within the field of heritage management.

I hereby also sign off this report.

Signed:

Date: 27 June 2011

A handwritten signature in black ink, appearing to read 'Anton Carl van Vollenhoven', written over a light blue horizontal line.

## SUMMARY

Archaetnos cc was appointed by Landscape Dynamics Environmental Consultants to conduct a basic assessment relating to the cultural heritage aspects for the proposed Marble Hall NDP Project. This entails the construction of approximately 42 km of 132 kV power line from the existing Wolvenkraal substation to the proposed new Moutse substation. This is situated in the Limpopo Province. One route with a partial alternative was investigated.

The fieldwork undertaken revealed no sites of cultural heritage significance. From a heritage perspective there is no specific preference as to which of the alternatives may be decided upon.

As the investigation was done via the air it needs to be indicated that certain areas with relatively dense bush may include heritage sites missed from the air. This however is limited as the view from the helicopter was quite good. An indication of these areas is however given in order for the client to know how these should be handled in future. There are no specific no-go areas relating to heritage on any of the alternatives. Chance finds that may be unearthed during construction activities must be brought under the attention of an archaeologist in order to assess the significance thereof as well as to recommend a way forward.

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## **1. INTRODUCTION**

Archaetnos cc was appointed by Landscape Dynamics Environmental Consultants to conduct a basic assessment relating to the cultural heritage aspects for the proposed Marble Hall NDP Project. This entails the construction of approximately 42 km of 132 kV power line from the existing Wolvenkraal substation to the proposed new Moutse substation. This is situated in the Limpopo Province. One option with a partial alternative was investigated.

The client indicated the area where the proposed development is to take place, and the survey was confined to this area.

## **2. TERMS OF REFERENCE**

The Terms of Reference for the survey were to:

1. Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the property (see Appendix A).
2. Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value (see Appendix B).
3. Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions.
4. Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources.
5. Recommend suitable mitigation measures should there be any sites of significance that might be impacted upon by the proposed development.
6. Review applicable legislative requirements.

## **3. CONDITIONS & ASSUMPTIONS**

The following conditions and assumptions have a direct bearing on the survey and the resulting report:

1. Cultural Resources are all non-physical and physical man-made occurrences, as well as natural occurrences associated with human activity. These include all sites, structure and artifacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development. Graves and cemeteries are included in this.
2. The significance of the sites, structures and artifacts is determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. The various aspects are

not mutually exclusive, and the evaluation of any site is done with reference to any number of these aspects.

3. Cultural significance is site-specific and relates to the content and context of the site. Sites regarded as having low cultural significance have already been recorded in full and require no further mitigation. Sites with medium cultural significance may or may not require mitigation depending on other factors such as the significance of impact on the site. Sites with a high cultural significance require further mitigation (see Appendix B).
4. The latitude and longitude of any archaeological or historical site or feature, is to be treated as sensitive information by the developer and should not be disclosed to members of the public.
5. All recommendations are made with full cognizance of the relevant legislation.
6. It has to be mentioned that it is almost impossible to locate all the cultural resources in a given area, as it will be very time consuming. Developers should however note that the report should make it clear how to handle any other finds that might occur.
7. It should be noted that in a few areas along the route the vegetation is quite dense which may have resulted in it not being properly screened from the air. These are however limited. Nevertheless there is a slim chance of finding cultural and archaeological sites during construction activities.

#### **4. LEGISLATIVE REQUIREMENTS**

Aspects concerning the conservation of cultural resources are dealt with mainly in two acts. These are the National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998).

##### **4.1 The National Heritage Resources Act**

According to the above-mentioned act the following is protected as cultural heritage resources:

- a. Archaeological artifacts, structures and sites older than 100 years
- b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography
- c. Objects of decorative and visual arts
- d. Military objects, structures and sites older than 75 years
- e. Historical objects, structures and sites older than 60 years
- f. Proclaimed heritage sites
- g. Grave yards and graves older than 60 years
- h. Meteorites and fossils
- i. Objects, structures and sites of scientific or technological value.

The national estate (see Appendix D) includes the following:



- a. Places, buildings, structures and equipment of cultural significance
- b. Places to which oral traditions are attached or which are associated with living heritage
- c. Historical settlements and townscapes
- d. Landscapes and features of cultural significance
- e. Geological sites of scientific or cultural importance
- f. Archaeological and palaeontological importance
- g. Graves and burial grounds
- h. Sites of significance relating to the history of slavery
- i. Movable objects (e.g. archaeological, palaeontological, meteorites, geological specimens, military, ethnographic, books etc.)

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon. An Archaeological Impact Assessment only looks at archaeological resources. An HIA must be done under the following circumstances:

- a. The construction of a linear development (road, wall, power line canal etc.) exceeding 300m in length
- b. The construction of a bridge or similar structure exceeding 50m in length
- c. Any development or other activity that will change the character of a site and exceed 5 000m<sup>2</sup> or involve three or more existing erven or subdivisions thereof
- d. Re-zoning of a site exceeding 10 000 m<sup>2</sup>
- e. Any other category provided for in the regulations of SAHRA or a provincial heritage authority

### **Structures**

Section 34 (1) of the mentioned act states that no person may demolish any structure or part thereof which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

A structure means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith.

Alter means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or the decoration or any other means.

### **Archaeology, palaeontology and meteorites**

Section 35(4) of this act deals with archaeology, palaeontology and meteorites. The act states that no person may, without a permit issued by the responsible heritage resources authority (national or provincial):

- a. destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;

- b. destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
- c. trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
- d. bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment that assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
- e. alter or demolish any structure or part of a structure which is older than 60 years as protected.

The above mentioned may only be disturbed or moved by an archaeologist, after receiving a permit from the South African Heritage Resources Agency (SAHRA). In order to demolish such a site or structure, a destruction permit from SAHRA will also be needed.

### **Human remains**

Graves and burial grounds are divided into the following:

- a. ancestral graves
- b. royal graves and graves of traditional leaders
- c. graves of victims of conflict
- d. graves designated by the Minister
- e. historical graves and cemeteries
- f. human remains

In terms of Section 36(3) of the National Heritage Resources Act, no person may, without a permit issued by the relevant heritage resources authority:

- a. destroy, damage, alter, exhume or remove from its original position of otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
- b. destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- c. bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation, or any equipment which assists in the detection or recovery of metals.

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (Act 65 of 1983) and to local regulations. Exhumation of graves must conform to the standards set out in the **Ordinance on Excavations (Ordinance no. 12 of 1980)** (replacing the old Transvaal Ordinance no. 7 of 1925).

Permission must also be gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

Human remains can only be handled by a registered undertaker or an institution declared under the **Human Tissues Act (Act 65 of 1983 as amended)**.

Unidentified/unknown graves are also handled as older than 60 until proven otherwise.

#### **4.2 The National Environmental Management Act**

This act (Act 107 of 1998) states that a survey and evaluation of cultural resources must be done in areas where development projects, that will change the face of the environment, will be undertaken. The impact of the development on these resources should be determined and proposals for the mitigation thereof are made.

Environmental management should also take the cultural and social needs of people into account. Any disturbance of landscapes and sites that constitute the nation's cultural heritage should be avoided as far as possible and where this is not possible the disturbance should be minimized and remedied.

### **5. METHODOLOGY**

#### **5.1 Survey of literature**

A survey of literature was undertaken in order to obtain background information regarding the area. Sources consulted in this regard are indicated in the bibliography.

#### **5.2 Field survey**

The survey was conducted according to generally accepted HIA practices and was aimed at locating all possible objects, sites and features of cultural significance in the area of proposed development. If required, the location/position of any site was determined by means of a Global Positioning System (GPS), while photographs were also taken where needed.

The survey was undertaken from the air with a helicopter. The visibility was good and the height such that archaeological sites would most likely have been spotted.

#### **5.3 Oral histories**

People from local communities are interviewed in order to obtain information relating to the surveyed area. It needs to be stated that this is not applicable under all circumstances. When applicable, the information is included in the text and referred to in the bibliography. In this instance it was not necessary to do.

#### **5.4 Documentation**

All sites, objects features and structures identified were documented according to the general minimum standards accepted by the archaeological profession. Co-ordinates of individual

localities were determined by means of the Global Positioning System (GPS)<sup>1</sup>. The information was added to the description in order to facilitate the identification of each locality.

## **6. DESCRIPTION OF THE AREA**

The area where the planned power line and substation will be erected is situated between the Wolvekraal substation on the farm Wolvenkraal 13 JS and the farm Keerom 729 KS in the Limpopo Province (Figure 1-2). The specific farms that are influenced by the development are Wolvenkraal 13 JS, Kleinklipput 11 JS, Slagboom 7 JS, Klipsyfering 2 JS, Loskop Noord 12 JS, Witfontein 1 JS, Zamenkomst 730 KS, Keerom 729 KS, Tambotielaaagte 733 KS and Gruysbank 5 JS.

The environment on the route and the alternative is mostly disturbed by agricultural activities. This includes ploughed fields and orchards, including irrigation channels and center pivot sprayers (Figure 3).

Some old fields were also visible as well as areas that were over grazed. Pioneer plant species dominate some of the areas with natural vegetation, indicating earlier disturbance. Very few areas with natural undisturbed vegetation are visible (Figure 4-15).

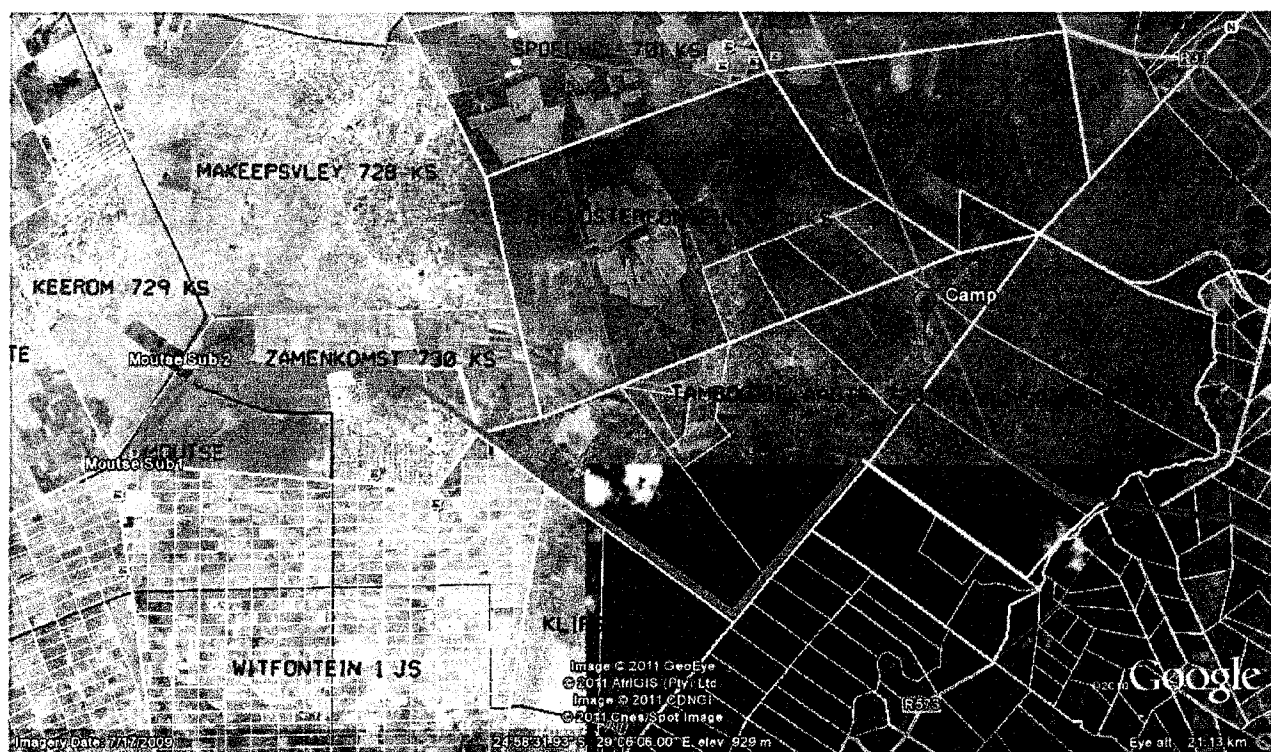
These areas also are reasonably flat which would have made it less attractive for human settlement, especially during prehistoric times as no natural shelter exists. It most probably was utilized during the past as the abundance of grazing and water would have lured people to the area. The finding of chance archaeological discoveries will therefore most likely be stone tools and potsherds out of context as well as isolated graves.

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<sup>1</sup> A Garmin 550 Oregon, which have a fault factor of a few meters.



**Figure 1** Google image indicating the location of the surveyed area.



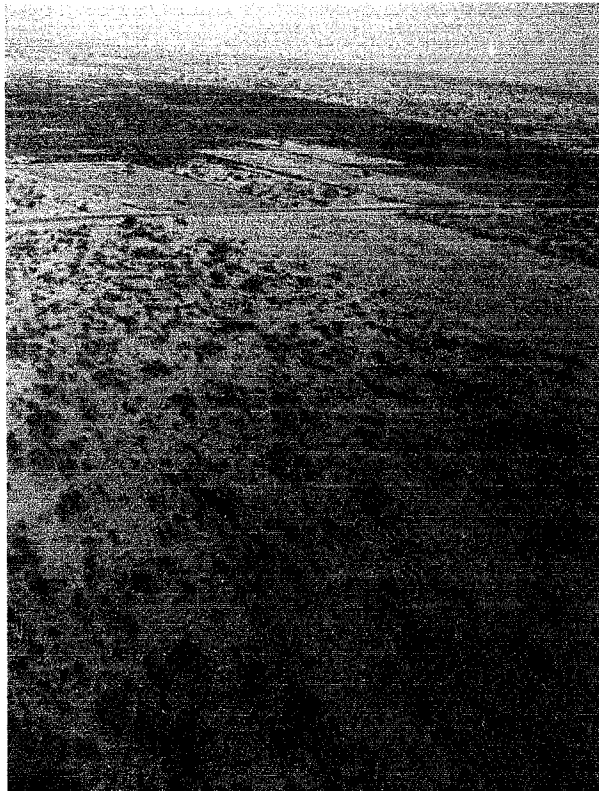
**Figure 2** Map indicating the two alternative routes for the power line (blue and yellow).



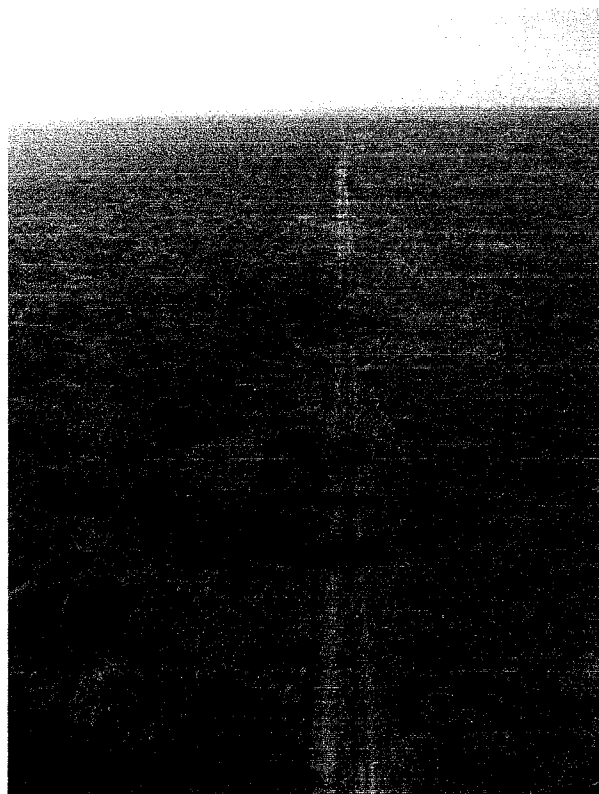
**Figure 3** General view of the surveyed area between the Wolwekraal substation and the proposed Moutse substation. Note the disturbance by agricultural activities.



**Figure 4** General view of the surveyed area.

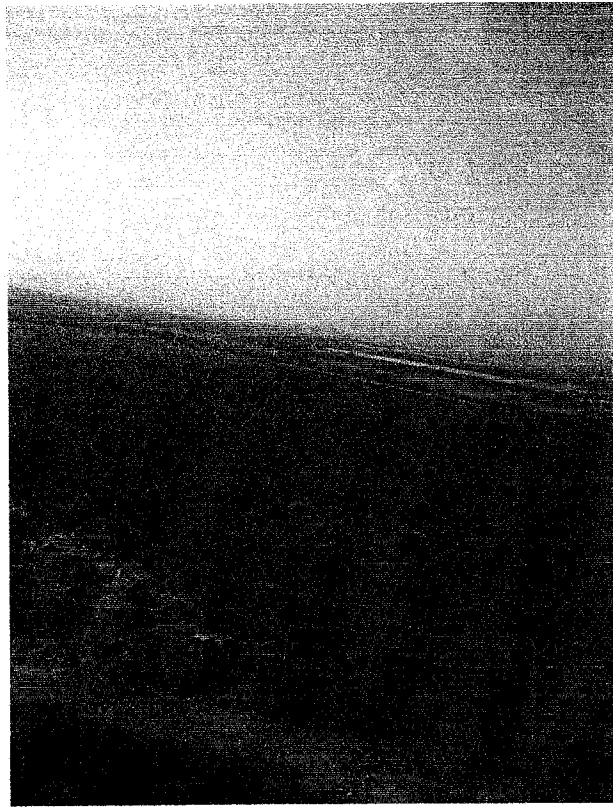


**Figure 5** Another view of the surveyed area indicating old fields in the background.



**Figure 6** Area where the power line will follow an existing farm road.



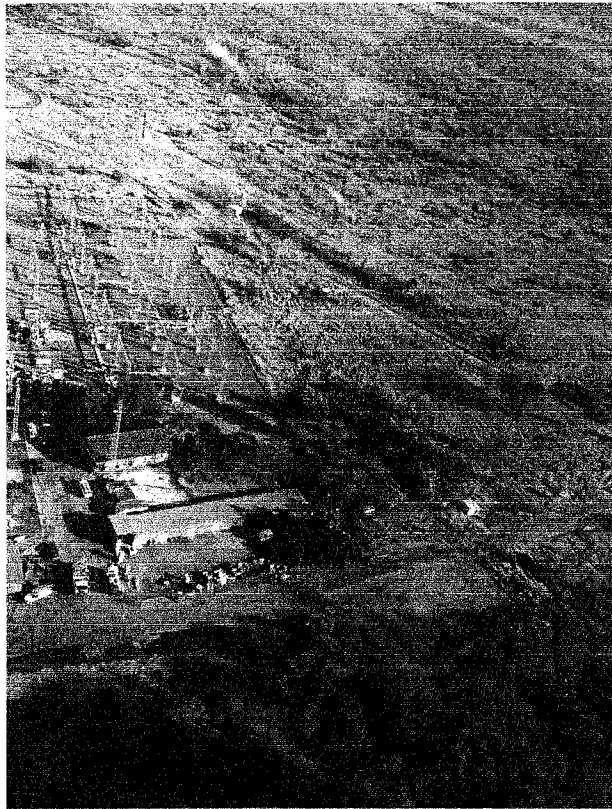


**Figure 7**      **Agricultural activities in the surveyed area.**



**Figure 8**      **Another view of the surveyed area.**





**Figure 9**      **The Wolvenkraal substation.**



**Figure 10**      **Another view along the proposed route.**



**Figure 11** View along the river where the power lines will cross.



**Figure 12** View the route towards the Zamenkomst village close to where the proposed Moutse substation will be placed.



**Figure 13**    **The Zamenkomst village.**



**Figure 14**    **Ploughed fields along the route.**



**Figure 15** Note the farm dam on this picture, indicating that one would be able to view archaeological sites from this height.

## **7. DISCUSSION**

During the aerial survey no sites of cultural heritage significance were located in the area to be developed. However, since there is a slight possibility that sites may be unearthed during construction activities, and in order to understand these, it is necessary to give a background regarding the different phases of human history.

### **7.1 Stone Age**

The Stone Age is the period in human history when lithic material was mainly used to produce tools (Coertze & Coertze 1996: 293). In South Africa the Stone Age can be divided in three periods. It is however important to note that dates are relative and only provide a broad framework for interpretation. The division for the Stone Age according to Korsman & Meyer (1999: 93-94) is as follows:

Early Stone Age (ESA) 2 million – 150 000 years ago  
Middle Stone Age (MSA) 150 000 – 30 000 years ago  
Late Stone Age (LSA) 40 000 years ago – 1850 - A.D.

No Stone Age sites are known from this area, but one has to rely that this probably only reflects the lack of research here. The nearest identified Stone Age sites are Middle and Late Stone Age sites close to Bela Bela (Bergh 1999: 4). Rock art, associated with the Late Stone Age, have been identified close to Roossenekal, east of the project area (Bergh 1999: 5).

Although no Stone Age features were found during the survey the environment would have supported these peoples and they probably did utilize it. Since the area is very flat and does not provide natural shelter, one does not expect to find more than isolated Stone Age artifacts, especially along the river.

## **7.2 Iron Age**

The Iron Age is the name given to the period of human history when metal was mainly used to produce artifacts (Coertze & Coertze 1996: 346). In South Africa it can be divided in three separate phases according to Huffman (2007: xiii) namely:

Early Iron Age (EIA) 250 – 900 A.D.  
Middle Iron Age (MIA) 900 – 1300 A.D.  
Late Iron Age (LIA) 1300 – 1840 A.D.

No Early Iron Age sites have been recorded in the project area, but again this probably only relates to the lack of research as the environment definitely is suitable for human habitation. Late Iron Age sites have also not been identified in the surveyed area, but a large number of sites are found to the south-east thereof around Roossenekal, Belfast and Machadodorp (Bergh 1999: 7). An iron working site was also identified to the east of Groblersdal, close to the Gauteng border (Bergh 1999:8).

No Iron Age sites and features were identified during the survey. However, the management and workers should nevertheless always be on the lookout for Iron Age features and artifacts, such as stone walling and pottery especially in the areas indicating as still having its natural vegetation and close to rivers and hills. These people may have utilized the area as it would have provided ample grazing for their livestock.

## **7.3 Historical Age**

The Historical Age started with the first historical sources which can be used to learn more about people of the past. In South Africa it can be divided into two phases. The first includes oral histories as well as the recorded oral histories of past societies. The latter were usually written by people who contact with such a community for a short time. This is followed by

the second phase which includes the moving into the area of people that were able to read and write (Van Vollenhoven 2006: 189).

A map in the historical atlas (Bergh 1999: 9) indicates that none of the early trade routes went through this area. These were located much further to the north.

The first Bantu language speakers in the area were the Kgatla, a Tswana group who settled to the north-west of the Elands River and the Kôpa, a Pedi group, who stayed to the south-east of Groblersdal (Bergh 1999: 10). It seems as if all these groups fled from the area during the Difaquane when Mzilikazi came here between 1823 and 37. The Kôpa moved to the south-west and the Kgatla further to the north-west (Bergh 1999: 11).

The early white travellers also did not move through the Groblersdal – Marble Hall area. The closest was the missionaries R Moffat and J Archbell who travelled between the Elands and Apies River, further to the west (Bergh 1999: 12). They were followed by D Livingstone in 1847. The trader R Scoon did however pass to the south and east of the surveyed area during 1836 (Bergh 1999: 13).

During the same year the Voortrekker party of H van Rensburg did however move through the area and crossed the Elands River close to where Groblersdal is today (Bergh 1999: 14). White farmers permanently settled in the western parts of the surveyed area between 1841 and 1850 (Bergh 1999: 15). Groblersdal only became a district in 1942 (Bergh 1999: 151).

No historical structures worthy of being preserved were found during the survey.

## **8. CONCLUSIONS AND RECOMMENDATIONS**

In conclusion it can be stated that the basic assessment of the area was conducted successfully. No sites of cultural significance have been found.

The final recommendations are as follows:

- From a heritage perspective it does not matter which one of the route alternatives are preferred.
- There are no no-go options. However areas with natural vegetation have a high possibility of covering archaeological sites. This should be kept in mind during further planning.
- Regardless of the option chosen it should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts are always a distinct possibility. Care should therefore be taken when development work commences that if any of these are accidentally discovered, a qualified archaeologist be called in to investigate.
- Due to constraints indicated above it may be possible that certain sites were not identified. In such a case an archaeologist should also be called in to investigate.

- A proper archaeological survey would be necessary once the final position of the power lines, pylons and substations have been determined.

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## APPENDIX A

### Definition of terms:

**Site:** A large place with extensive structures and related cultural objects. It can also be a large assemblage of cultural artifacts, found on a single location.

**Structure:** A permanent building found in isolation or which forms a site in conjunction with other structures.

**Feature:** A coincidental find of movable cultural objects.

**Object:** Artifact (cultural object).

(Also see Knudson 1978: 20).



## APPENDIX B

### Definition of significance:

- Historic value: Important in the community or pattern of history or has an association with the life or work of a person, group or organization of importance in history.
- Aesthetic value: Important in exhibiting particular aesthetic characteristics valued by a community or cultural group.
- Scientific value: Potential to yield information that will contribute to an understanding of natural or cultural history or is important in demonstrating a high degree of creative or technical achievement of a particular period
- Social value: Have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
- Rarity: Does it possess uncommon, rare or endangered aspects of natural or cultural heritage.
- Representivity: Important in demonstrating the principal characteristics of a particular class of natural or cultural places or object or a range of landscapes or environments characteristic of its class or of human activities (including way of life, philosophy, custom, process, land-use, function, design or technique) in the environment of the nation, province region or locality.

## APPENDIX C

### **Cultural significance:**

- Low            A cultural object being found out of context, not being part of a site or without any related feature/structure in its surroundings.
- Medium        Any site, structure or feature being regarded less important due to a number of factors, such as date and frequency. Also any important object found out of context.
- High            Any site, structure or feature regarded as important because of its age or uniqueness. Graves are always categorized as of a high importance. Also any important object found within a specific context.

### **Heritage significance:**

- Grade I        Heritage resources with exceptional qualities to the extent that they are of national significance
- Grade II       Heritage resources with qualities giving it provincial or regional importance although it may form part of the national estate
- Grade III      Other heritage resources of local importance and therefore worthy of conservation

## APPENDIX D

### Protection of heritage resources:

#### - Formal protection

National heritage sites and Provincial heritage sites – grade I and II

Protected areas - an area surrounding a heritage site

Provisional protection – for a maximum period of two years

Heritage registers – listing grades II and III

Heritage areas – areas with more than one heritage site included

Heritage objects – e.g. archaeological, palaeontological, meteorites, geological specimens,  
visual art, military, numismatic, books, etc.

#### - General protection

Objects protected by the laws of foreign states

Structures – older than 60 years

Archaeology, palaeontology and meteorites

Burial grounds and graves

Public monuments and memorials

**Appendix E: Comments and Responses Report (with written comment received)**

# **Eskom Marble Hall NDP Project : Wolvekraal – Moutse**

## **Comments and Responses Report (with written correspondence attached)**

### **1. Comment received after the distribution of the First Phase Notification Letter**

#### The South African Heritage Resources Agency

They confirmed that a Phase 1 Heritage Impact Assessment has to be undertaken.

#### *Response :*

*A Phase 1 Heritage Impact Assessment was undertaken by Dr Anton van Vollenhoven (included in Appendix D of the Basic Assessment Report). He confirmed that no sites of cultural heritage significance had been identified.*

#### Mr Joseph Kempen

Mr Kempen stated that letters for signatures had been delivered to numerous farmers in the area. They are not happy at all because the compensation amounts offered are way under market value and furthermore no consultations took place with them. They believe they are bullied into signing off their land.

#### *Response :*

*Mr Kempen was informed that the Basic Assessment Process followed for this project was done on behalf of Eskom Distribution and that no letters for signature had been delivered to landowners for this project.*

*It was later confirmed with Mr Kempen at the Public Open Day, that Eskom Transmission was also in an EIA process to establish a route for the Burotho-Marble Hall 400kV in the macro area and that the negotiators on behalf of Eskom Transmission delivered the letters for signature to the potentially affected landowners. Landscape Dynamics strived to accommodate this transmission route as far as possible to restrict impact on landowners. Liaison with the directly affected landowners for the Marble Hall NDP Wolvekraal to Moutse project is undertaken strictly according to the requirements for public participation as prescribed by the Department of Environment Affairs. Mr Kempen was satisfied with this process followed by Landscape Dynamics in association with the negotiator on behalf of Eskom, Ms Anne-marie Botha (AMP Property Management and Land Acquisition).*

#### Marble Hall Kleinhandel (Pty) Ltd

The referred to the map with the initial three route options investigated. They objected against the route affecting the farm Elandsdrift.

#### *Response :*

*The final proposed route does not affect the farm Elandsdrift. They have been invited to the Public Open Day which was attended by Mr JJ Prinsloo. They were informed of the final proposed route which does not affect their property. No further comment had been received.*

#### Mark Pratt

They confirmed they are from the farm Rhenosterfontein 731KS and requested more information in terms of the proposed route.

#### *Response :*

*Mr Pratt was invited to the Public Open Day where the proposed route was discussed. The final route that is recommended will not affect his property. No further comment had been received.*



## 2. Written correspondence received during and after the Open Day (held on 2 March 2011)

Mr LJ De Beer (Landowner Portion 1050 Loskop-Noord 12-JS, Chairman of the Geloftefees Komitee)

He confirmed that they do not object against the proposed powerline, however, it is important that the line must not be situated closer than 100metres from the community hall. Alternatively the land may be purchased at a price of R3,6 million.

*Response :*

*Noted and will be included in the final Environmental Management Plan.*

Mr Johan Cillie (Portion 6 of Tambiotielaagte 733-KS, Marsonita)

He initially requested that the powerline be reroutes along the farms Klipsyufering and Witfontein because of little development on that side of the fence.

He confirmed that he has a landing strip for helicopters and small aircraft and that it might not be affected by the proposed powerline.

He stated that, should the line have to traverse his property, it is a requirement that there must a new electrified game fence erected on the eastern side of the servitude. The entire servitude must be cleared and the wood must be stacked for his use in an area to be indicated once specific Inegotiations take place.

*Response :*

*Noted and these requirements will be included in the final Environmental Management Plan. He was however informed that no promises could be made in terms of the requirement for an electrified game fence, however, all the requirements would be forwarded to AMP Negotiators, Ms Anne-marie Barnard, who would negotiate reasonable terms on behalf of Eskom.*

Mr PJ Van Heerden (Portion 785 of Loskop-Noord 12-JS)

He had the following requirements :

- the powerline must be high enough so that it could not interfere with giraffes
- wood from debushing and maintenance must be placed in neat piles for his use
- he must be informed everytime before Eskom requires access to his property
- all alien invasive plants, specifically the 'blouhaak' in the servitude area must be controlled
- he requires that contact details (name and telephone numbers) of an Eskom representative and the construction team be provided to him
- he requires that no excavations may be left open for longer than 12 hours
- Construction may only take place between 07:00 in the mornings and 17:00 in the afternoons on normal working days. No contractors would be allowed over week-ends.

*Response :*

*Noted and these requirements will be included in the final Environmental Management Plan*

Mr Mark Pratt (Lannea Beleggings and owner of Portion 1 of Rhenosterfontein 731-KS)

He confirmed that he objected against the route that was at that stage presented to him. His objections was based on the fact that he farms with sable antelope and has a heli-pad, both of which would be affected by the powerline.

*Response :*

*His comments are noted, however, his property would no longer be affected by the proposed powerline.*

Mr Deon Hough, also on behalf of his brother Joggie (Portions 890 and 1085 Loskop-Noord 12-JS)

Mr Hough confirmed that the powerline could run along his fence as proposed to him. He also requested that, except for a selective few trees to be indicated on site to Eskom, the servitude should be cleared completely. He also requested that the sicken bush must be removed from the servitude area and must be stacked in a place to be indicated to Eskom to ensure that tyres would not be affected.

*Response :*

*Noted and these requirements will be included in the final Environmental Management Plan*

Mr Eric van Rensburg (Portion 0 of Grysbank 5-JS)

The powerline must be high enough so that his giraffes would not be affected. The proposed Distribution line must run as close as possible to the border fence and the proposed Eskom Transmission Line. Once the Eskom Transmission line turns towards the north, the Distribution line towards the west must move closer to the fence line.

*Response :*

*Noted and these requirements will be included in the final Environmental Management Plan*

Mr JA De Bruyn (Portion 786 of Loskop-Noord 12-JS)

Mr De Bruyn was concerned that the proposed line would impact on the land value of his property and that purchasers are not interested in land with Eskom servitudes thereon. He stated that nothing would prevent Eskom from constructing further lines on his property.

*Response :*

*Noted and the negotiator was informed of these concerns. She confirmed that she would ensure the best reasonable compensation possible.*

Mr Fanie Oosthuizen (Portion 351 of Loskop-Noord 12-JS)

He requested that only selective bushing must be done and that the wood must be stacked in a place determined by him for his use. No contractors or personnel may hunt or place animal traps on his property. Access would be allowed on his property only during normal working hours. All communication must be done via his daughter Mrs Suzette Potgieter, tel 082 498 4776.

*Response :*

*Noted and will be included in the final Environmental Management Plan*

Lokisa Environmental Consultants

They confirmed they act on behalf of Undara Investments (Pty) Ltd, landowner of portions of the farms Rhenosterfontein 731KS, Tambotielaagte 733 KS and Claremont 734KS.

They strongly objected against the proposed Eskom Transmission line (Burotho-Marble Hall 400kV line). They also confirmed that they have not been involved in proper communication from Eskom Transmission. They requested that the route be amended where it would affect their property.

In terms of the relevant Eskom Marble Hall NDP Project : Wolvekraal-Moutse (relevant to this application) they stated their concerns in terms of the proposed route alignment that would affect an existing dam with associated birdlife; vulture breeding nests in close proximity to the alignment; as well as game (sable antelope and buffaloes, as well as potentially rhino's in the near future). Their hunting lodge would also be affected. They supplied their recommendations in terms of a workable route alignment of both Eskom Distribution and Eskom Transmission lines where their properties would be affected. They also require that some of the existing 11kV lines and structures that are no longer required on his property be removed.

*Response :*

*Mr Neil Rex and Ms Elaine Holtzhausen had been invited to the Open Day on 2 March 2011 where the proposed route had been discussed and was amended to accommodate their*

concerns. They had also been provided with photographs of the proposed pylon structure to be used in order to allow for fair assessment of the visual impact that could be expected. The amended route had been forwarded to them after the meeting for their consideration. They requested that another meeting be held with them on site. This took place on 24 June 2011. During this meeting consensus was reached with regards to the proposed Eskom Distribution route where it would affect their property.

They had also been informed that all their concerns and recommendations relevant to the proposed 400kV transmission line had been forwarded by both Landscape Dynamics and Ms Anne-marie Botha (Eskom Distribution negotiator) to the relevant officials at Eskom Transmission for consideration. It was also stated that even though reasonable effort was made to amend the Transmission route alignment, no promises could be given by Eskom Distribution in this regard. They were informed of the relevant officials at Eskom Transmission with whom further liaison with regards to that specific line should take place.

Ms Hilda Howard (Landowners Portion 24,95 and 63 of Loskop-Noord 12-JS)

She requested telephonically whether their properties would be affected.

Response:

The proposed route alignment had been forwarded to her and it was confirmed that their properties are not affected. No further comment had been received.

### **3. Communication during the meeting held with the local community on Zamenkomst**

A meeting was held with the Matlerekeng Tribal Authority on the farm Zamenkomst 730-KS. The main objective of the meeting was to establish whether the proposed Moutse Substation and a portion of the powerline could be built on their land. Both alternative sites had been presented to them. The meeting was attended by 22 representatives of the community. Minutes of this meeting is attached in Appendix G of the Basic Assessment Report. They wanted to know whether they would be supplied with electricity and they wanted to know how much compensation would be.

Response :

They were informed that they would have to apply formally to Eskom for electricity supply, but that the entire project would ensure that the network is strengthened and the electricity would be available to the macro area. They were also informed that compensation would take place based on market value of land and that valuers would be appointed by Eskom to determine this value. Negotiations in terms of the servitude and substation site would take place via Ms Anne-marie Botha on behalf of Eskom. The servitude width and substation site requirements were communicated with them.

Consensus was reached that the project as proposed could be constructed on their land.

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**Eskom Marble Hall NDP Project : Wolvekraal to Moutse**  
**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS : PUBLIC PARTICIPATION PROGRAMME**  
**PUBLIC OPEN DAY : WRITTEN RESPONSES**

2 March 2011  
 09:00-14:00 at the Laerskool Marble Hall

The Project Applicant is Eskom Holdings Limited- represented by Eskom Distribution Northern Region, Menlyn Office. The project involves the construction of an approximately 42 kilometers 132kV powerline from the existing Wolvekraal Substation to and including a new Moutse Substation (inclusive of a communication tower). The study area includes the macro area west and southwest of the town of Marble Hall in the Mpumalanga Province. Please refer to the locality map with the different route options attached hereto.

16-3-2011

**Contact details of stakeholder**

Name: L.J. de Beer  
 Interest: Voorsitter van gelatifiede komitee  
 Name of property owned / representing: Gedeelte 105a: 105kP N. 12 J.S.  
 Postal Address: Bus 375  
 Tel Number: 082 7626076 Fax Number: 013 261 2410  
 E-mail Address: \_\_\_\_\_

**Comment / Concerns / Recommendations / Questions / Requirements**

Hier is 'n uitdruklike voorwaarde betrekke op die eiendom nr. gedeelte 105a 105kP N. 12 J.S. Gemeenskap Saal. Die omgewing is 'n boerdery, kappie en ligging van die deel van die reël, waarvan die saal daar gelê is. Ons stel dit duidelik dat ons nie 'n probleem het as 'n kraglyn oor ons eiendom loop, maar dit moet 'n nie enige natuur-skade aanrig binne 100 meter van die saal nie. Ma.w. waarde die sekkie mag nie nader as 100 meter van die saal wees nie. Hierdie is 'n uitdruklike voorwaarde vir ons.

Alternatiewelik kan die grond en saal gekoop word vir R. 3,6 miljoen.

*L.J. de Beer*

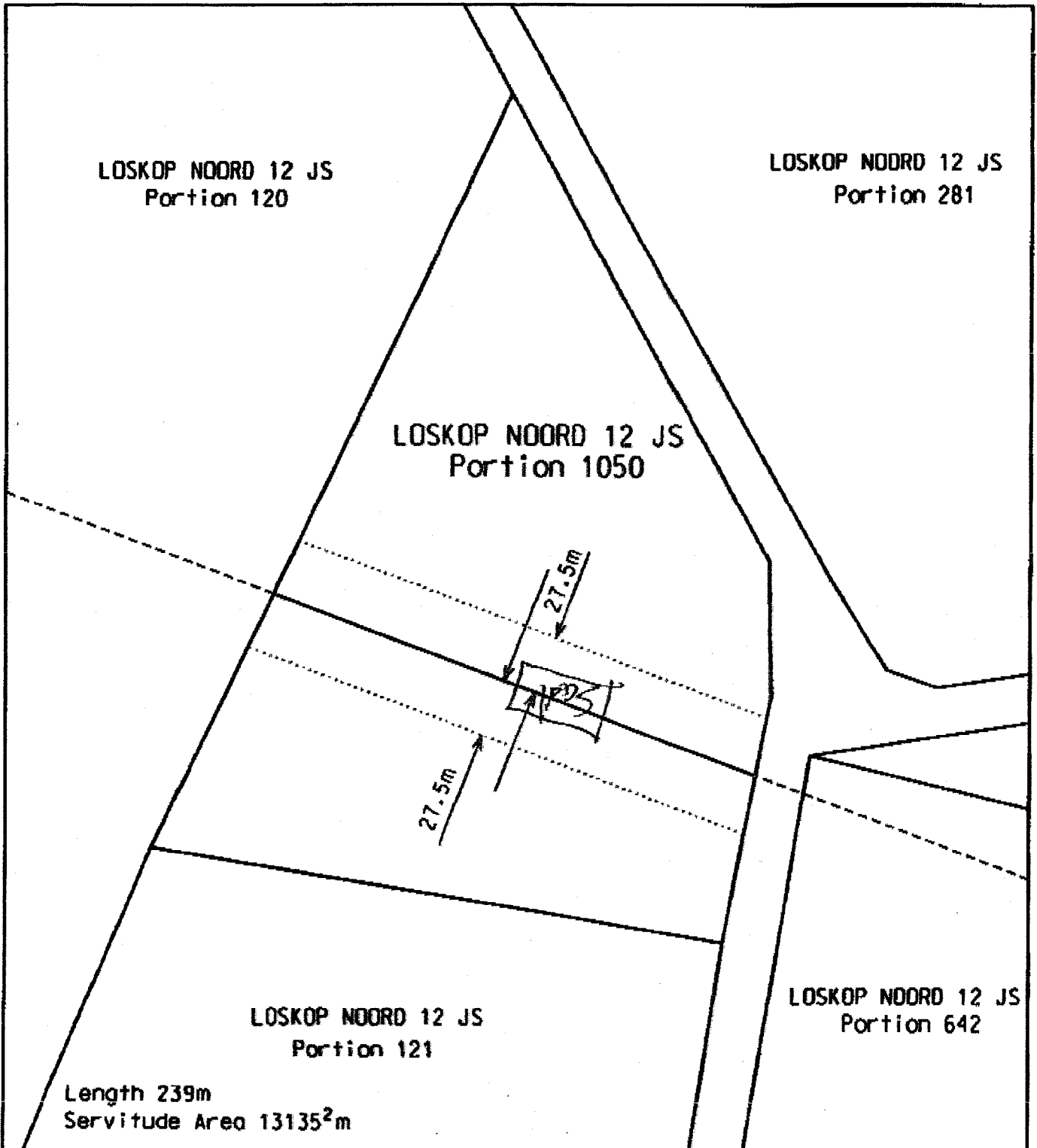
*L.J. de Beer*



L.J. de Beer

Set. 082 7626076. Fax 013 261 2410

Na stuur ontvangs erkenning aan.

Please submit this document to the environmental consultants Landscape Dynamics (Annelize or Zelda) using one of the following methods: preferably by hand at the Open Day; alternatively by fax - 012 346 2356 / 086 685 3822; or via e-mail - [agrobler@landscapedynamics.co.za](mailto:agrobler@landscapedynamics.co.za)  
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 <b>Eskom</b> <small>Transmission</small>	PROPOSED ROUTE OF <u>400kV</u> TRANSMISSION LINE INDICATED IN RED VOORGESTELDE ROETE/S VAN <u>400kV</u> KRAGLYN AANGEDUI IN ROOI			
	SIGNATURES / HANDTEKENING			ROUTE ROETE
	REG. OWNER GEREG. EIENAAR			MARBLE HALL - MOKOPANE
	WITNESS 1. GETUIE			PROPERTY EIGENDOM
	WITNESS 2. GETUIE			DATE DATUM
		SCALE SKAAL	1:2 500	

Dumie James 084 772 1148

ITEM

**Eskom Marble Hall NDP Project : Wolvekraal to Moutse**  
**ENVIRONMENTAL IMPACT ASSESSMENT PROCESS : PUBLIC PARTICIPATION PROGRAMME**  
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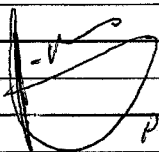
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**Contact details of stakeholder**

Name: JOHAN CILLIE  
Interest: MARSHALLA  
Name of property owned / representing: TAMBOTIE LAACHTES K5 733/3  
Postal Address: P.O. BOX 4435 MIDDELBURG 1050  
Tel Number: 0833294439 Fax Number: 013-2825008  
E-mail Address: johancillie1@gmail.com

**Comment / Concerns / Recommendations / Questions / Requirements**

- ① ERSTE KEUSE DAT NUWE LYN OOR KLIPSYFERING + WITFOUNTEIN SAL GAAN AANGESIEN DAAR BITTERMIJN ONTWIKKELING HUIDERLIK. DUS DIT SAL DIE BESTE OPSIE WES.
- ② EK WIL HELIKOPTER EN VASTVELK (LISENSIE NO 0370248371) DAAR IS N AANLOOPBAAR OP DIE PLAAS WAT DEUR DIE POLISIE (SAPD) OOR GEBRUIK WORD. IN NUWE LYN KAN DIE VEILIGHEID VAN ULLES OP MY GROUND. BATE GEVAERLIK WAAR.
- ③ INDIEN DIE LYN OOR MY PLAAS GAAN MOET SAAR N NUWE HEINING OOS EN ~~WES~~ N VAN DIE NUWE HEINING WES. DIE HEINING MOET OOR GE-ELECTRIFISEERD WES. (WILSKEMMING) DIE TOTALE SKWARTUIT MOET DAN OOR OUBOS WES. EN DIE HOUD SLY OUYANE.



P.J. Cillie

0833294439

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**Contact details of stakeholder**

Name: P.J. van Heerden

Interest: Geen

Name of property owned / representing

Postal Address: PO5 bus 742 Marble Hall

Tel Number: 072 718 5043

Fax Number:

E-mail Address: elize.vanHeerden@agri.co.za

**Comment / Concerns / Recommendations / Questions / Requirements**

- Krag moet hoog genoeg wees sodat kameelperde kan rond loop.
- Hout moet nageklaar word na ontbossing. (op netjies hoop geplaa word)
- Hoof hek moet gebruik word, geen adisionele hekke mag opgesit word. nie.
- Eienaar moet in kennis gestel word voor eskom die grond betree via oproef. <sup>elk keer</sup>
- Bestaande eskom moet hoog genoeg wees vir kameelperde.
- Dring aan op beheer van alle indringer plante binne sensitief area (bv. blouhaak).
- Wil kontak naam en nommer hi vir kommunikasie voor tyden, en na konstruksie.
- Geen uitgrawes mag vir langer as 12 ure op wees nie.
- Konstruksie kan net plaasvind tussen 7uur die oggend en saam die middag of wetsdae. Geen konstruksie op naweke.

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**Contact details of stakeholder**

Name: Linda Belcognojs (Mark Pratt)  
Interest: \_\_\_\_\_  
Name of property owned / representing 13 1/2 Rhenosterfont. (Savanna)  
Postal Address: Postbus 303; Middelburg.  
Tel Number: 083 230 6042 Fax Number: 013-2461336  
E-mail Address: MCP@vodamail.co.za

**Comment / Concerns / Recommendations / Questions / Requirements**

1) NB landingstrook (boer met swartwitpense) 1/2 helipad  
By verre onderste alternatief - boonste  
nie aanvaarbaar nie.

2) Die "Preferred Route" mag nie die  
aanloopbaan op 733/6. beïnvloed nie.

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**Contact details of stakeholder**

Name: \_\_\_\_\_  
Interest: Gen. 1085 (Dean Hough) odc nms Jozebe (broer) nms 890  
Name of property owned / representing \_\_\_\_\_  
Postal Address : \_\_\_\_\_  
Tel Number: \_\_\_\_\_ Fax Number : \_\_\_\_\_  
E-mail Address : \_\_\_\_\_

**Comment / Concerns / Recommendations / Questions / Requirements**

1) Bevestiging dat roete al langs grens kan gaan soos bespreek. LD moet op plan bevestig

2) Die totale serwitruimte behalwe vir selektiewe bome (sal op terrein saam met Eskom uitgewys word) moet skoonghou word.

3) Alle sekerbosse wat verwyder word moet op 'n geïdentifiseerde plek (saam met Eskom) gestoor word om pyp-bande te verhoed.

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**Contact details of stakeholder**

Name: Eric van Rensburg  
Interest: Part. o Gruysbank 5 JS.  
Name of property owned / representing \_\_\_\_\_  
Postal Address : \_\_\_\_\_  
Tel Number: \_\_\_\_\_ Fax Number : \_\_\_\_\_  
E-mail Address : \_\_\_\_\_

**Comment / Concerns / Recommendations / Questions / Requirements**

1) Pylons moet hoog genoeg wees om kamedperde te akkomodeer.

2) Ons lyn moet so na as moontlik aan die beoogde transmissie en grenslyn loop.  
Naby Transmissie wegvraai moet 132KV terugspring naer aan grenslyn.

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**Contact details of stakeholder**

Name: JACOBUS ANDRIES DE BRUYN  
Interest: OWNER  
Name of property owned / representing: LOSKOP NOORD 12 JS  
Postal Address: 1246 MARBLE HALL  
Tel Number: 0527771309 Fax Number: -  
E-mail Address: -

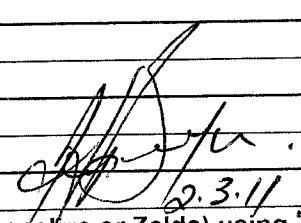
**Comment / Concerns / Recommendations / Questions / Requirements**

i) MAAK BESWAARTEEN DIE LYN! HET OOK BESWAAR GEHRAK TEEN DIE 400KV LYN. DIT VERMINDER DIE PRAAS SE WEL VERMEDE MET 114% - DWS VIR DIE BLAARVRETERS.

ii) WAT IN GEDAGTE GEHOU MOET WORD MET JUL INPAK STUDIES IS DAT ONS AS PENSIONAARISSE HIER BELE HET EN HOU DEPRESIEER DIE GROND GEWELDIG. KOPERS STEK NIE BEGANG IN GROND WAT 'N SERVITUUT OP HET NIE.

iii) NIEKS KEER ESKOM OM HOU VERDERE LYNE OPTERIG OOR DIE GROND NIE.

iv) OP DIE EINDE VAN DIE DAG GAAN DIE BELEGGING NIEKS WERD WARD NIE.

  
2.3.11

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ENVIRONMENTAL IMPACT ASSESSMENT PROCESS : PUBLIC PARTICIPATION PROGRAMME

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### Contact details of stakeholder

Name: Oom Fanie Oosthuizen  
Interest: \_\_\_\_\_  
Name of property owned / representing 351 Loskop - Noord  
Postal Address : \_\_\_\_\_  
Tel Number: \_\_\_\_\_ Fax Number : \_\_\_\_\_  
E-mail Address : \_\_\_\_\_

### Comment / Concerns / Recommendations / Questions / Requirements

- 1) Mag net selektiewe ontbossing doen.
- 2) Geen Eskom personeel mag jag of valstrikke stel nie.
- 3) Die hout van ontbossing sal op 'n plek gestapel word deur Mnr Oosthuizen aangewys.
- 4) Blegs werksure toegang tot plas.
- 5) Vir enige kommunikasie moet sy dogter mev Suzette Potgieter. (tel. 082 4984776)

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(Please supply any written response within 14 days from the date of the Open Day.)



**SOUTH AFRICAN HERITAGE  
RESOURCES AGENCY**

111 HARRINGTON STREET, CAPE TOWN, 8000  
PO BOX 4637, CAPE TOWN, 8000  
TEL: (021) 462 4502 FAX: (021) 462 4509

DATE: 27 October 2010  
ENQUIRIES: Mr. Phillip Hine  
Archaeology, Palaeontology and Meteorite Unit  
E-mail: phine@sahra.org.za  
Web site: www.sahra.org.za

YOUR REF:  
OUR REF: 9/2/266/0001

Ms. Annelize Grobler  
Landscape Dynamics Environmental Consultants  
P.O. Box 947  
Groenkloof  
Pretoria  
0027

Dear Madam

**AN ESKOM MARBLE HALL NDP PROJECT-APPROXIMATELY 42 KM  
132KV POWER LINE FROM WOLWEKRAAL SUBSTATION TO THE AND  
INCLUDING THE NEW PROPOSED MOUTSE SUBSTATION:  
ENVIRONMENTAL IMPACT ASSESSMENT PROCESS: NOTIFICATION OF  
PROJECT WITH INVITATION TO SUPPLY INITIAL COMMENT AND  
INPUT.**

Thank you for your indication that development is to take place in this area.

In terms of the National Heritage Resources Act, no 25 of 1999, heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer (or mine) to ensure that a **Heritage Impact Assessment** is done. This must include the archaeological component (Phase 1) and any other applicable heritage components. Appropriate (Phase 2) mitigation, which involves recording, sampling and dating sites that are to be destroyed, must be done as required.

In your application received by SAHRA there was no indication of an assessment of the archaeological resources. The quickest process to follow for the archaeological component is to contract a specialist (see link to CRM archaeologists) to provide a Phase 1 Archaeological Impact Assessment Report. This must be done before any large development takes place.

The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the end of the process the heritage authority may give permission for destruction of the sites.

Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary. (See attached list of accredited Palaeontologists).

If the property is very small or disturbed and there is no significant site the specialist may choose to send a letter to the heritage authority to indicate that there is no necessity for any further assessment.

Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewsapes must also be assessed.

Attached please find a list of palaeontological specialists who may be contacted to undertake the necessary palaeontological impact assessments. See link below for CRM archaeologists.

Yours sincerely



PP Nonofho Ndobochani  
SAHRA: Archaeology, Palaeontology and Meteorite Unit  
For: CHIEF EXECUTIVE OFFICER

Copy: PHRA **Mpumalanga** Office

Appendices: List of accredited Palaeontologists.  
See [www.aspa.org.za](http://www.aspa.org.za) for list of CRM archaeologist

**Subject:** RE: Eskom - Wolwekraal - Moutse  
**From:** "Joseph Kempen" <joseph@loskopagri.co.za>  
**Date:** Tue, 21 Dec 2010 16:55:17 +0200  
**To:** <agrobler@landscapedynamics.co.za>

Dankie

Ons praat later weer

Geseënde Kersfees

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**From:** agrobler@landscapedynamics.co.za [mailto:agrobler@landscapedynamics.co.za]  
**Sent:** 21 December 2010 01:10 PM  
**To:** Joseph Kempen  
**Cc:** Annelize Grobler  
**Subject:** Re: Eskom - Wolwekraal - Moutse

Beste Mnr Kempen, ek is nie bewus van enige briewe v Eskom Distribusie wat uitgedeel word. Ons is in ons omgewingsimpakstudie- proses nog nie naby bedrae aanbied, ens nie. Al wat ek kan dink is dat die briewe kan kom van Eskom Transmissie vir hulle groot lyne wat hulle in die makro area beplan. Ek is ongelukkig aan die Suidkus, maar sal verseker dit met die relevante persone by Eskom opneem vroeg in die Nuwejaar! Vriendelike groete, Annelize Grobler

Sent via my BlackBerry from Vodacom - let your email find you!

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**From:** "Joseph Kempen" <joseph@loskopagri.co.za>  
**Date:** Tue, 21 Dec 2010 13:01:49 +0200  
**To:** <agrobler@landscapedynamics.co.za>  
**Subject:** FW: Eskom - Wolwekraal - Moutse

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**From:** Joseph Kempen [mailto:joseph@loskopagri.co.za]  
**Sent:** 20 December 2010 02:48 PM  
**To:** 'Annelize'  
**Subject:** RE: Eskom - Wolwekraal - Moutse

Hi Annelize

Met verwysing na my vorige e-mail wil ek graag net die volgende onder jou aandag bring.

Sedert laas Saterdag 18/12/2010 het Eskom briewe by boere begin aflaai en gevra hulle moet dit teken. Wat ons egter ontstel is dat die boer of eienaar R 8000.00 per ha aangebied word en dat dit vër onder die waarde van die grond is.

Volgens ons, is daar nog geen konsultasie met enige van ons gedoen nie, en het jy in jou e-maail hieronder bevestig dat als nog net opsies is. As Eskom dink die boere wat geraak word, somer blindelings gaan teken en die regte prosedures nie gevolg gaan word nie maak hulle n groot fout. Niemand is onwillig vir vooruitgang nie maar nie op n BOELIE metode nie.

Die persone wat die briewe aan die boere besorg het verder aan van die boere gesê dat daar niks is wat hulle(Boere) daaraan kan doen nie want Eskom is 'n baie groot maatskappy.

Laat weet my dringend sodat ek n paar baie KWAAL boere kan rustig maak

Groete

Joseph Kempen

082 572 8088

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**From:** Annelize [mailto:agrobler@landscapedynamics.co.za]

**Sent:** 01 November 2010 05:16 PM

**To:** Joseph Kempen

**Subject:** Re: Eskom - Wolwekraal - Moutse

Beste Mnr Kempen

Hiermee die kaart aangeheg! Neem asb kennis dat hierdie 3x opsies bloot 'n wegspringplek is vir besprekings en hoegenaamd nie finaal is nie. Ons sal u spoedig kontak re verdere verwickelinge en vergaderinge.

Vriendelike groete

Annelize Grobler

Landscape Dynamics Environmental Consultants

PO Box 947; Groenkloof; Pretoria; 0027

Tel 082 566 4530 / 012 460 6043

Fax 012 346 2356 / 086 685 3822

----- Original Message -----

**From:** Joseph Kempen

**To:** [agrobler@landscapedynamics.co.za](mailto:agrobler@landscapedynamics.co.za)

**Sent:** Wednesday, October 27, 2010 11:51 AM

**Subject:** Eskom - Wolwekraal - Moutse

Hi Annelize

As ons n Kaart kan kry sal dit baie help.

My belang is volgens jou rekords - Cotmaster

My besonderhede

E-Mail - [joseph@loskopagri.co.za](mailto:joseph@loskopagri.co.za)

Selfoon - 082 572 8088

Fax - 013 261 2641

Dankie

Joseph Kempen

**MARBLE HALL  
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**0450**

**VAT NR: 4730147305**

Landscape Dynamics

Posbus 947

Groenkloof

Pretoria

0027

17 November 2010

**Is: Eskom Marble Hall NDP Project**

U skrywe gedateer 19/10/2010 gerig van Elandsdrift JS 8, Posbus 631, Marble Hall, 0450; Aandag Flip en Lizette Coetzee:

U toekomstige skrywes moet aan bogemelde adres gerig word vir Aandag; Cheem Prinsloo.

Ek het 'n kaart bekom waarop 3 maontlikke roetes vir die Kraglyn aangetoon word.