

Umsobomvu Substation, Concrete Tower Manufacturing Facilities and Temporary Laydown Area, situated in the Umsobomvu Local Municipality (Northern Cape Province) and the Inxuba Yethemba Local Municipality (Eastern Cape Province)

Avifaunal statement

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1. Introduction

Umsobomvu Wind Power (Pty) Ltd is proposing the development of infrastructure to supplement the development of the authorised Wind Energy Facilities (WEFs) in proximity to the infrastructure site. The proposed infrastructure is situated on Portion 8 of Uitzicht Farm 3, the Remaining Extent (RE) of Winterhoek Farm 118, and the RE of Elands Kloof Farm 135. These properties are situated within the Umsobomvu Local Municipality in the Northern Cape Province and the Inxuba Yethemba Local Municipality in the Eastern Cape Province.

The proposed development includes:

1. **IPP Substation**. The assessment of one (1) 600 m x 900 m area which will include:
 - An IPP 132 kV Substation up to 22 500 m²;
 - 132 kV Distribution Substation up to 22 500 m²;
 - Operation and Maintenance (O&M) Building up to 22 500 m²; and
 - A 132 kV Overhead Line (OHL) of up to 400 m in length. This power line will fall within the 600m x 900m assessment site
2. **Concrete Tower Manufacturing Facility**. The assessment of two (2) 300 m x 300 m areas which will include:
 - Area 1: A Concrete Tower Manufacturing Facility (CTMF) and Temporary Laydown Area of up to 60 000 m²; and
 - Area 2: A CTMF of up to 60 000 m².
3. **Access road & intersection**. The construction of an up to 3.5 km long new access road, including a new intersection, with sections of the road route requiring the widening of existing roads to 12 m in width during construction which will then be rehabilitated to 8 m in width during operation.

The planned development requires approval from environmental authorities prior to commencement. A Basic Assessment application must be submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) in terms of EIA Regulations (2014 as amended) under Section 24 of the National Environmental Management Act (No. 107 Of 1998).

WildSkies Ecological Services (Pty) Ltd was appointed by CES to compile an avifaunal statement for this application. WildSkies conducted the original avifaunal studies for the proposed wind farms, including 12 months of pre-construction bird monitoring on site (WildSkies, 2015).

The proposed project layout is shown in Figure 1.

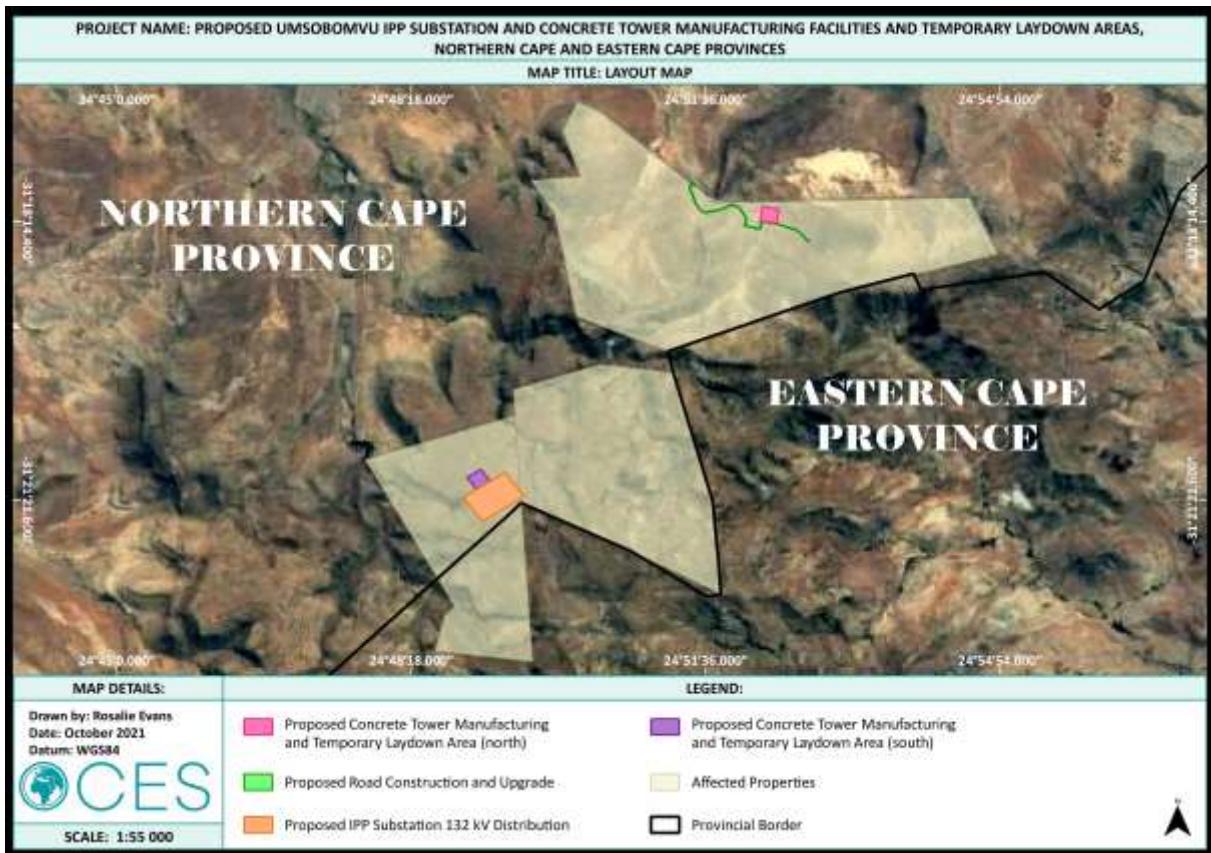


Figure 1. The project layout (map by CES).

2. Methodology

The methods employed for this avifaunal statement were as follows:

- Assess the proposed development on a desktop basis, considering experience and data collected on site to date
- Assess impacts according to the criteria provided by CES (Appendix 1).

3. Impact assessment

The impacts have been assessed formally according to the criteria supplied by CES (Appendix 1). In summary, four impacts of the proposed development on avifauna are possible: destruction of bird habitat during construction; disturbance of birds during construction and operations; electrocution of

birds on overhead lines and in the substation; and collision of birds with overhead power lines. These are each described in more detail below:

3.1 Destruction of bird habitat during construction

The impact of habitat destruction will be of Low significance both pre and post mitigation. The proposed site is not on particularly unique nor sensitive habitat. The original avifaunal impact assessments for the wind farms identified areas of particular importance for various bird species and classified these as sensitive for development. The proposed site does not infringe on these identified areas (see Section 4 & Figure 2).

There is no mitigation that can substantially reduce this impact further as it is inevitable that the required surface area will be developed. Avoidance has already been applied by avoiding avifaunal sensitivity areas as described in Section 5 and Figure 2. As a precautionary measure and general good practice we recommend the following:

- No unnecessary alteration or removal of any remaining natural vegetation should take place during construction.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment.
- All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.

3.2. Disturbance of birds during construction & operations

We judge the significance of this impact to be Low for both pre and post mitigation. The only sensitive avifaunal features (breeding sites) on site have already been buffered by a suitable distance to guard against any disturbance impacts during construction. Once operational, the proposed facilities will create very little disturbance.

As a precautionary measure and general good practice we recommend the following:

- All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment.

3.3. Electrocution of birds on overhead lines & in substation

Electrocution of birds on the proposed overhead power line will be of Low significance for two reasons: the very short length of the power line (<400m); and the close proximity of the line to the substation and office complex (sensitive bird species are unlikely to frequent this area). However if the power line

towers/pylons are not correctly designed impacts could still occur. The power line must therefore be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds (such as Verreaux's and Martial Eagle) to perch on them in safety. Electrocution of birds in the substation itself is a possibility, but not likely to affect important bird species (typically common species such as crows frequent these areas) and is of Low significance. To summarise, the following mitigation is required:

- The power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds (such as Verreaux's and Martial Eagle) to perch on them in safety

3.4. Collision of birds with overhead power line

Collision of birds with the overhead power line on site will be of Low significance for two reasons: the very short length of the power line (<400m); and the close proximity of the line to the substation and office complex (sensitive bird species are unlikely to frequent this area). No mitigation is required in this regard.

Table 1. Summary of formal assessment of impacts on avifauna (see Appendix 1 for criteria)

PROJECT COMPONENTS	CAUSE AND COMMENT	EFFECT				SIGNIFICANCE WITHOUT MITIGATION	REVERSIBILITY	MITIGATION MEASURES	SIGNIFICANCE OF IMPACT WITH MITIGATION
		DURATION	EXTENT	SEQUENCE / SEVERITY	PROBABILITY				
		(SIGNIFICANCE WITHOUT MITIGATION)					(SIGNIFICANCE WITH MITIGATION)		
Overhead power line & IPP Substation	Large birds are electrocuted whilst perched on pylons or in substation, by bridging the critical clearances between phases or phase-earth hardware.	Permanent	Global	Slight	Possible	LOW NEGATIVE	Very difficult	The power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds (such as Verreaux's and Martial Eagle) to perch on them in safety .	LOW NEGATIVE
Impact: Collision of birds on overhead power line									
Overhead power line	Birds in flight collide with overhead cables (conductors or earth wires) whilst in mid-flight. This occurs when they don't see the cables until too late to take evasive action.	Permanent	Global	Slight	Possible	LOW NEGATIVE	Very difficult	No mitigation is required..	LOW NEGATIVE

4. Sensitivity mapping

We have confirmed that the proposed sites avoid all previously identified avifaunal sensitivities. This is shown in Figure 2. The intersection and road widening portion does enter into one of the dam buffers, but this is acceptable, since these buffers were identified for bird collision risk with turbines and overhead power lines.

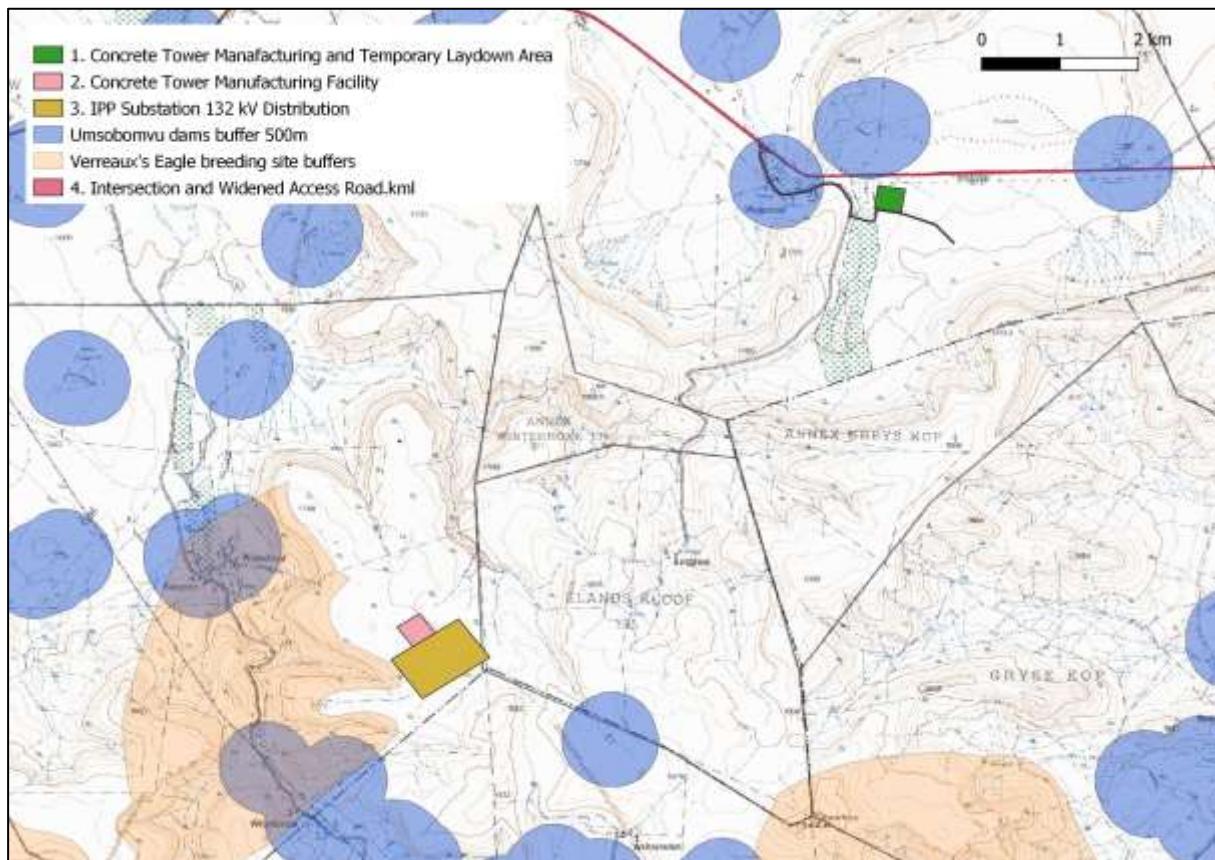


Figure 2. Proposed site locations relative to the original avifaunal No-Go areas.

5. Conclusions

Our key findings are as follows:

- The impacts of the proposed facility will be:
 - Habitat destruction during construction will be of Low negative significance both pre and post mitigation
 - Disturbance of birds during construction and operations will be of Low negative significance both pre and post mitigation

- Electrocution of birds on the overhead power line and in the IPP substation during operations will be of Low negative significance both pre and post mitigation (due mostly to the very short length of power line - <400m).
 - Collision of birds with the overhead power line will be of Low significance pre and post mitigation (due mostly to the very short length of power line - <400m).
- The proposed location for the facilities avoid all avifaunal sensitivity areas identified previously for the wind farm and associated infrastructure (Figure 2).

The recommended mitigation is as follows:

- No unnecessary alteration or removal of any remaining natural vegetation should take place during construction.
- All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment.
- All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.
- The power line must be built on an Eskom approved bird-friendly pole structure which provides ample clearance between phases and phase-earth to allow large birds (such as Verreaux's and Martial Eagle) to perch on them in safety
- No mitigation is required for bird collision with the power line due to its short length.

6. References

WildSkies Ecological Services (Pty) Ltd. 2015. Umsobomvu Wind Energy Facility - avifaunal impact assessment. Unpublished report to CES.

Appendix 1. Impact assessment criteria

The following standard rating scales have been defined for assessing and quantifying the identified impacts. This is necessary since impacts have a number of parameters that need to be assessed. The identified impacts have been assessed against the following criteria:

Six factors are considered when assessing the significance of the identified issues, namely:

1. **Significance** - Each of the below criterion (points 2-6 below) are ranked with scores assigned, as presented in Table 1 to determine the overall significance of an activity. The total scores recorded for the effect (which includes scores for duration; extent; consequence and probability) and reversibility / mitigation are then read off the matrix presented in Table 9-1, to determine the overall significance of the issue. The overall significance is either negative or positive.
2. **Consequence/severity** - the consequence scale is used in order to objectively evaluate how severe a number of negative impacts might be on the issue under consideration, or how beneficial a number of positive impacts might be on the issue under consideration.
3. **Extent** - the spatial scale defines the physical extent of the impact.
4. **Duration** - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
5. The **probability** of the impact occurring - the likelihood of impacts taking place as a result of project actions arising from the various alternatives. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident) and may or may not result from the proposed development and alternatives. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.
6. **Reversibility / Mitigation** – The degree of difficulty of reversing and/or mitigating the various impacts ranges from very difficult to easily achievable. The four categories used are listed and explained in Table 9-1 below. Both the practical feasibility of the measure, the potential cost and the potential effectiveness is taken into consideration when determining the appropriate degree of difficulty.

The relationship of the issue to the temporal scale, spatial scale and the severity are combined to describe the overall importance rating, namely the significance of the assessed impact.

The impact is first classified as a positive (+) or negative (-) impact. The impact then undergoes an evaluation according to a set of criteria.

Ranking of Evaluation Criteria.

	Duration	
Effect	Short term	Less than 5 years
	Medium term	Between 5-20 years
	Long term	More than 20 years
	Permanent	Over 40 years or resulting in a permanent and lasting loss
	Extent	
	Localised	Impacts affect a small area of a few hectares in extent. Often only a portion of the project area.
	Study area	The proposed site and its immediate surroundings.
	Municipal	Impacts affect the Nelson Mandela Bay Metropolitan Municipality, or any towns within the municipality.
	Regional	Impacts affect the wider area or the Eastern Cape Province as a whole.
	National	Impacts affect the entire country.
	International/Global	Impacts affect other countries or have a global influence.
	Consequence/severity	
	Slight	Slight impacts or benefits on the affected system(s) or party(ies)
	Moderate	Moderate impacts or benefits on the affected system(s) or party(ies)
	Severe/ Beneficial	Severe impacts or benefits on the affected system(s) or party(ies)
	Probability	
	Definite	More than 90% sure of a particular fact. Should have substantial supportive data.
	Probable	Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
	Possible	Only over 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Unsure/Unlikely	Less than 40% sure of a particular fact, or of the likelihood of an impact occurring.
	Impact Reversibility / Mitigation	
Reversibility/ Mitigation	Easy	The impact can be easily, effectively and cost effectively mitigated/reversed
	Moderate	The impact can be effectively mitigated/reversed without much difficulty or cost
	Difficult	The impact could be mitigated/reversed but there will be some difficulty in ensuring effectiveness and/or implementation, and significant costs
	Very Difficult	The impact could be mitigated/reversed but it would be very difficult to ensure effectiveness, technically very challenging and financially very costly

Impacts Severity Rating

Impact severity (The severity of negative impacts, or how beneficial positive impacts would be on a affected system or affected party)	
Very severe	Very beneficial
An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated. For example the permanent loss of land.	A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit. For example the vast improvement of sewage effluent quality.
Severe	Beneficial

Long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming, or some combination of these. For example, the clearing of forest vegetation.	A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these. For example an increase in the local economy.
Moderately severe	Moderately beneficial
Medium to long term impacts on the affected system(s) or party (ies), which could be mitigated. For example constructing a sewage treatment facility where there was vegetation with a low conservation value.	A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way. For example a 'slight' improvement in sewage effluent quality.
Slight	Slightly beneficial
Medium or short term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary. For example a temporary fluctuation in the water table due to water abstraction.	A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.
No effect	Don't know/Can't know
The system(s) or party(ies) is not affected by the proposed development.	In certain cases it may not be possible to determine the severity of an impact.

Overall Significance Rating

OVERALL SIGNIFICANCE (THE COMBINATION OF ALL THE ABOVE CRITERIA AS AN OVERALL SIGNIFICANCE)	
VERY HIGH NEGATIVE	VERY BENEFICIAL (VERY HIGH +)
These impacts would be considered by society as constituting a major and usually permanent change to the (natural and/or social) environment, and usually result in severe or very severe effects, or beneficial or very beneficial effects. Example: The loss of a species would be viewed by informed society as being of VERY HIGH significance. Example: The establishment of a large amount of infrastructure in a rural area, which previously had very few services, would be regarded by the affected parties as resulting in benefits with VERY HIGH significance.	
HIGH NEGATIVE	BENEFICIAL (HIGH +)
These impacts will usually result in long term effects on the social and/or natural environment. Impacts rated as HIGH will need to be considered by society as constituting an important and usually long term change to the (natural and/or social) environment. Society would probably view these impacts in a serious light. Example: The loss of a diverse vegetation type, which is fairly common elsewhere, would have a significance rating of HIGH over the long term, as the area could be rehabilitated. Example: The change to soil conditions will impact the natural system, and the impact on affected parties (such as people growing crops in the soil) would be HIGH.	
MODERATE NEGATIVE	SOME BENEFITS (MODERATE +)
These impacts will usually result in medium to long term effects on the social and/or natural environment. Impacts rated as MODERATE will need to be considered by society as constituting a fairly important and usually medium term change to the (natural and/or social) environment. These impacts are real but not substantial. Example: The loss of a sparse, open vegetation type of low diversity may be regarded as MODERATELY significant.	
LOW NEGATIVE	FEW BENEFITS (LOW +)
These impacts will usually result in medium to short term effects on the social and/or natural environment. Impacts rated as LOW will need to be considered by the public and/or the specialist as constituting a fairly unimportant and usually short term change to the (natural and/or social) environment. These impacts are not substantial and are likely to have little real effect. Example: The temporary changes in the water table of a wetland habitat, as these systems are adapted to fluctuating water levels. Example: The increased earning potential of people employed as a result of a development would only result in benefits of LOW significance to people who live some distance away.	
NO SIGNIFICANCE	
There are no primary or secondary effects at all that are important to scientists or the public. Example: A change to the geology of a particular formation may be regarded as severe from a geological perspective, but is of NO significance in the overall context.	
DON'T KNOW	

In certain cases it may not be possible to determine the significance of an impact. For example, the primary or secondary impacts on the social or natural environment given the available information.

Example: The effect of a development on people's psychological perspective of the environment.

All feasible alternatives and the “no-go option” will be equally assessed in order to evaluate the significance of the “as predicted” impacts (prior to mitigation) and the “residual” impacts (that remain after mitigation measures are taken into account). The reason(s) for the judgement will be provided when necessary.

All impacts must have a “cause and comment”, a significance rating before mitigation, after mitigation and for the no-go option. Impacts should also indicate applicable mitigation measure/recommendations to reduce the impact significance.