CASTLE WIND ENERGY FACILITY AND ASSOCIATED INFRASTRUCTURE ON A SITE NEAR DE AAR, NORTHERN CAPE PROVINCE (DEA REF: 14/12/10/3/3/2/278/AM2)

MOTIVATION FOR SECOND AMENDMENT OF ENVIRONMENTAL AUTHORISATION

DOCUMENT FOR PUBLIC REVIEW

OCTOBER 2016

Prepared for:

Castle Wind Farm (Pty) Ltd

24 th floor Metropolitan Centre, 7 Walter Sisulu Avenue
Foreshore, Capetown

Prepared by:

Savannah Environmental Pty Ltd

FIRST FLOOR, BLOCK 2
5 WOODLANDS DRIVE OFFICE PARK
CNR. WOODLANDS DRIVE AND
WESTERN SERVICES ROAD, WOODMEAD
P.O. BOX 148, SUNNINGHILL, 2157
TEL: +27 (0)11 656 3237
FAX: +27 (0)86 684 0547
E-MAIL: INFO@SAVANNAHSA.COM
WWW.SAVANNAHSA.COM

Savannah ENVIRONMENTAL (PTY) LTD

TABLE OF CONTENTS

APPENDICES

PROJECT DETAILS

Title	**:**	Castle Wind Energy Facility and Associated Infrastructure On A Site Near De Aar, Northern Cape Province: Motivation For Second Amendment of Environmental Authorisation
Report compiled by	:	John von Mayer Jo-Anne Thomas
Specialist Consultants	:	Jon Smallie (WildSkies) Morne de Jager (EAR) Werner Marais (Animalia) Lourens Du Plessis (SMEC)
Client	**:**	Castle Wind Farm (Pty) Ltd
Review Period	:	21 October 2016 – 21 November 2016

PURPOSE OF THIS REPORT

Castle Wind Farm (Pty) Ltd received an Environmental Authorisation (EA) for the construction of the Castle Wind Energy Facility near De Aar in the Northern Cape Province (DEA ref: 14/12/16/3/3/2/278) on 8 May 2015. An amendment correcting the listed activities was received on 30 June 2015.

Following developments in technology after the issuing of the EA and considering wind monitoring results from the site and economic feasibility, the developer is now proposing to increase the maximum turbine hub height from 120m to a maximum of 130m and increasing the maximum rotor diameter from 132m to 150m. The turbine specification is also proposed to be amended from 3.5MW to a maximum of 4.5MW and including an overall wind farm generation capacity of up to 118 MW. The project will still fall within the originally authorised footprint of the facility and the amendments do not trigger any listed activities.-

The overall wind farm generation capacity limit is included in this amendment in order to limit the increase in generation capacity to 9.5 MW, which with the zero increase in footprint avoids the triggering of Activity 1 of Listing Notice 1 of the 2014 regulations. The proposed amendments in themselves are thus not listed activities and do not trigger any new listed activity (as the proposed amendments are within the originally authorised development footprint).

The project description on page 6 of the EA is therefore proposed to be amended as follows:

Up to 31 wind turbines with a generating capacity of up to 4.5MW each, with a hub height of up to 130m and a rotor diameter of up to 150m and an overall wind farm generation capacity of up to 118 MW

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014, it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved. Savannah Environmental has prepared this motivation report in support of this amendment application on behalf of Castle Wind Farm (Pty) Ltd.

This report aims to provide detail pertaining to the significance and impacts of the proposed change to the project description in order for interested and affected parties to be informed of the proposed amendment and provide comment, and for the competent authority to be able to reach a decision in this regard. This report is supported by specialist studies in order to inform the final conclusion regarding the proposed amendments. This main report must be read together with these

specialist studies in order to obtain a complete understanding of the proposed amendments and the implications thereof.

This amendment motivation report will be made available to registered interested and affected parties for a 30-day period from **21 October 2016 to 21 November 2016.** The document is available for download at www.savannahsa.com/projects and CD copies are available on request from the contact person below.

To obtain further information, register on the project database, or submit written comment please contact:

Gabriele Wood of **Savannah Environmental**
Post: PO Box 148, Sunninghill, 2157 Johannesburg
Tel: 011 656 3237
Fax: 086 684 0547
Email: gabriele@savannahsa.com
www.savannahsa.com

1. OVERVIEW OF THE PROJECT

Location:

The Castle Wind Energy Facility is located on a site ~28 km north-east of De Aar and ~22 km south-west of Philipstown. This development is proposed to comprise a cluster of up to 31 wind turbines (typically described as a wind energy facility or a wind farm) to be constructed within a larger area of approximately ~3257ha in extent. This area comprises the following farm portions:

» Portion 12 of Vendussie Kuil (Farm number 165)
» Portion 13 of Vendussie Kuil (Farm number 165)
» Remaining Extent of Portion 0 of Knapdaar (Farm number 8)

Environmental sensitivity:
From the specialist investigations undertaken within the EIA process for the proposed wind energy facility no environmental fatal flaws were identified. However, the following environmental sensitivities and potential impacts were identified:

» Potential noise impact
» Areas of visual impact
» Potential impacts on birds
» Potential impacts on bats

Key conclusions and recommendations of the EIA pertinent to this application:

» The bird species recorded flying most frequently on site were the Northern Black Korhaan, and Southern Pale Chanting Goshawk. The Lesser Kestrel and Amur Falcon were recorded infrequently on site, which may be as a result of low food occurrence during the monitoring programme (and these flocking species may occur in high numbers on site at some point during the lifespan of this project when food is more abundant). Due to the overall low flight activity recorded on site, the collision risk index that was developed highlighted very little in the way of spatial patterns in flight activity. No turbine re-positioning was recommended as a result of the collision risk index. Most flight activity recorded was in the flatter lower lying areas to the east, which are not targeted for turbine placement. Based on a formal risk assessment, two species emerge as being of 'medium' risk of impact by the proposed wind farm, the Northern Black Korhaan and the Southern Pale Chanting Goshawk. The significance of impacts on avifauna as a result of habitat destruction, disturbance of birds, and displacement of birds is rated as medium significance. Collision of birds with turbines is rated as low significance. Site sensitivity mapping has identified buffers around dams, within which no turbines should ideally be built. The

Avifaunal Assessment Report (5 September 2016) identified three turbines: T3; T4; and T13 which were slightly located within the bird sensitive buffer areas. As a migratory strategy the turbines have subsequently been relocated outside the sensitivity buffer areas previously identified.

» Potential bat roosting sites are present along several drainage lines and rocky elevations found throughout the study site. These areas often have favourable weather conditions which cause increases in insect abundance and thus possible increases in bat activity. No turbines are located within any of the bat high sensitivity areas and their respective buffers, which are considered to be critical for resident bat populations, capable of elevated levels of bat activity and support greater bat diversity than the rest of the site. These areas are 'no-go' areas and turbines should not be located in these areas.

» The wind turbines would likely be visible to a number of farm residences and sections of secondary roads traversing near or over the development site. Affected farmsteads, excluding the ones located within the development site, may include: Kranskop, Klipfontein, Vendusiekraal, Disselskuil and Slingershoek. It is envisaged that the structures (where visible from shorter distances) may constitute a high visual prominence, potentially resulting in a high visual impact. It must however be noted that a large section of the potential viewshed area of the Castle Wind Energy Facility turbines, especially within a 10km radius of the facility, fall within farms earmarked for construction of the Longyuan Mulilo De Aar 2 North Wind Energy Facility and Mulilo De Aar 2 South Wind Energy Facility.

» Noise sensitive receptors do occur in and around the site. The significance of the noise impact is considered to be of a low significance for all Noise Sensitive Developments.

No environmental fatal flaws were identified to be associated with the proposed Castle Wind Energy Facility. However a number of issues requiring mitigation were highlighted. Environmental specifications for the management of potential impacts are detailed within the Environmental Management Programme (EMPr).

2. DETAILS OF THE AMENDMENTS APPLIED FOR

2.1. Turbine Specifications

It is proposed to change the turbine specifications as follows:

Authorised turbine specifications	**Amended turbine specifications**
Up to 3.5 MW turbines	Up to 4.5 MW turbines
Up to 120 m Hub Height	Up to 130 m Hub Height
Up to 132 m rotor diameter	Up to 150 m rotor diameter
An overall wind farm generation capacity of up to 108.5 MW (calculated as up to 31 turbines of up to 3.5 MW each)	An overall wind farm generation capacity of up to 118 MW

These changes in turbine specifications will fall within the originally authorised footprint of the facility and does not trigger any listed activities.

The project description on page 6 of the EA is therefore proposed to be amended as follows:

Up to 31 wind turbines with a generating capacity of up to 4.5MW each, with a hub height of up to 130m and a rotor diameter of up to 150m and an overall wind farm generation capacity of up to 118 MW.

3. MOTIVATION FOR THE PROPOSED AMENDMENTS

3.1. Technical Motivation

Following developments in technology after the issuing of the original EA and in considering the wind monitoring results from the site as well as economic feasibility, the developer is proposing to amend the turbine specifications in order to increase the efficiency of the facility and consequently the economic feasibility thereof.

4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS

In terms of Regulation 31 of the EIA Regulations 2014, an environmental authorisation may be amended by following the process in this Part (i.e. a Part 2 amendment) if it is expected that the amendment may result in an impact where such level or nature of impact was not:

a) Assessed and included in the initial application for environmental authorisation; or
b) Taken into consideration in the initial authorisation.

And the change does not, on its own, constitute a listed or specified activity.

The Department of Environmental Affairs (DEA), as the Competent Authority, has confirmed that this process is to be followed for the amendment under consideration. This section of the report provides an assessment of the amendment in terms of the requirements of Regulation 32.

4.1. Potential for Change in the Significance of Impacts as Assessed in the EIA as a Result of the Proposed Amendment

In terms of Regulation 32(1)(i), the following section provides an assessment of the impacts related to the proposed change. Understanding the nature of the proposed amendments the following has been considered:

» Noise impacts
» Visual impacts
» Impacts on birds
» Impacts on bats

The change in rotor diameter, hub height and overall generating capacity of the wind farm are expected to have no effect on the findings of the ecology report, heritage report, paleotolgocial report, freshwater report and the soils report. The footprint of the proposed infrastructure is not proposed to change and therefore the change in specifications will have no effect on the findings of these studies. Unless it is found that the visual impacts would significantly increase the findings of the social impact assessment would also remain unchanged.

The potential for change in the significance of impacts based on the proposed amendments as described within this motivation report is discussed below, and detailed in the specialists' opinion letters contained in Appendix A-D.

i) Noise impact (Appendix A):

Considering the sound power emission levels of the Vestas V117 3.3 MW wind turbine, the final EIA report indicated that the potential significance of the noise impact would be low during both the construction and operational phases. This wind turbine has a maximum sound power emission level of 104 dBA at a wind speed of 8 m/s and noise levels from the turbines were projected less than 38 dBA at the closest receptors.

The developer currently is considering using a turbine similar to the Enercon E-141, a wind turbine with a maximum sound power emission level of 105.5 dBA (at wind speeds exceeding 8 m/s). Considering the noise levels as modelled previously as well as the increased noise emission levels (1.5 dB higher), it is the specialist's opinion that the changes will not significantly increase noise levels (from the levels modelled) at the identified potential noise-sensitive receptors.

The specialist concluded that the noise magnitude (as well as probability of an impact occurring) would stay the same, or slightly reduce and the significance of the potential noise impact would remain low. It will therefore not be necessary to review the noise report and the recommendations and conclusions as contained in the noise report included with the Final EIA report are considered sufficient.

ii) Visual impact (Appendix B):

A visibility analysis was undertaken within the EIA from each of the wind turbine positions (31 in total) at an offset of 186m (maximum blade tip height) above ground level. The viewshed analysis was repeated as part of this amendment application process at an offset of 205m to indicate the visual exposure of the increased turbine dimensions.

It is clear (refer to specialist assessment Appendix B) that the approximately 9% increase in turbine dimensions, would have a relatively small influence on the overall visual exposure, due to the already tall turbine structures. The surface area (within the study area) of the original turbine exposure is 320km^2, compared to the 325km^2 of the increased dimensions turbine exposure. This is an increase of 5km^2, or alternatively, a 1.5% increase in potential visual exposure.

There are no additional sensitive visual receptors located within the area of increased visual exposure. Potential sensitive visual receptors (identified during the EIA phase) include:

» Klipfontein
» Disselskuil
» Vendusiekraal
» Rooiwal
» Slingershoek

» Pienaarskloof
» Tweefontein
» Garrenboom
» Groenpan
» Die Dam

Note: The location of the majority of these homesteads (excluding Klipfontein and Disselskuil) on properties earmarked for future or potential wind energy facility developments reduces the probability of this impact occurring. Others, e.g. Vendusiekraal and Kranskop, are believed to be derelict or uninhabited. In the event that the homesteads are deserted, the visual impact will be non-existent, until such time as these are inhabited again.

The increased area of visual exposure does not include a significant portion of additional exposure to major roads within the study area.

It is expected that the wind turbine structures, both the original dimensions and the proposed increased dimensions, would be equally visible and noticeable from both the roads and homesteads identified above.

iii) Impacts on Bats (Appendix C):

The proposed increase in rotor diameter, in combination with the proposed increased hub height will result in an increase of 1m for the minimum rotor swept ground clearance. Such a difference is minimal and insignificant. However, the larger rotor diameter will result in a larger airspace occupied per turbine and therefore will slightly increase the probability of impacting bats. Additionally, the closest rotor swept point to any high sensitivity buffer will be 9m closer to such a buffer/sensitivity with the proposed amendment. To compensate for this, turbines 1, 20, 24 and 28 (closest to high sensitivity buffers) will need to receive special attention during the operational monitoring, not necessarily excluding any of the other turbines on site. In addition, the wind farm operator will need to be made aware of the higher possibilities of these turbines requiring mitigation measures, if proven to be required by the operational monitoring.

It is important to note that even with the proposed amendments no turbines will intrude onto any high or moderate sensitivities or their buffers and is respective of the bat sensitivity map. Considering all factors, and on condition that the above recommendations are met, the proposed amendments will not affect the larger outcomes, conclusions and impact assessment as assessed during the bat EIA and long term preconstruction study, and is therefore still acceptable from a bat sensitivity perspective.

iv) Impacts on Birds (Appendix D):

Formal assessment of the significance of avifauna impacts as part of the final EIA report resulted in habitat destruction, disturbance of birds, and displacement of birds being rated as medium significance. Collision of birds with turbines was rated as low significance, and collision or electrocution on the grid connection power line was rated as medium-high significance.

The specialist concluded that the proposed amendment will have no bearing on the significance of habitat destruction, disturbance of birds, displacement of birds, and collision/electrocution on power lines. The only impact that could be affected by the amendment is that of collision with turbines: height above ground of rotor and the total area of risk window posed by the rotors.

The change in the rotor zone height above ground (from 54-186m, to 55-205m) as a result of the change in turbine model would have no material effect on the original EIA findings.

Examination of available international literature on the relationship between turbine size and bird fatalities revealed that the proposed amendment would have little effect on the original findings. The proposed change to the turbine model and the effect on the height above ground of the rotor zone will make very little difference to the previous findings, since most recorded bird flights were well below rotor zone anyway. Therefore, the change in risk window presented by the amendment of turbine dimensions is of no consequence as birds do not fly through it anyway. Only 7 species were recorded flying more than once in 192 hours of observation during the pre-construction monitoring. This is an exceptionally low flight activity. Three of these species were Red Listed: Verreaux's Eagle (7 records - Vulnerable); Karoo Korhaan (3 records - Near-threatened); and Ludwig's Bustard (2 records - Endangered). These species are at low risk of collision based on data collected on site.

In summary, the proposed amendment does not substantially alter the risk to avifauna, and does not change the significance of the impacts as previously assessed. The significance of collision of birds with turbines remains of LOW significance. As a result there is no need for additional mitigation as a result of the proposed amendment.

4.2. Advantages and Disadvantages of the Proposed Amendments

In terms of Regulation 32(1)(a)(ii), this section provides details of the advantages and disadvantages of the proposed amendment.

Advantages of the amendment	Disadvantages of the amendment
The increase in maximum blade length, hub	No disadvantages are expected. The

Advantages of the amendment	Disadvantages of the amendment
height and MW for each turbine will increase the efficiency of the facility and consequently the economic feasibility thereof. In addition, this would result in an increased capacity (albeit small at 9.5 MW) within the same footprint reducing the need for additional power generation facilities on additional footprints, thereby reducing the environmental impact of power generation projects on a cumulative basis.	proposed amendment will not result in any additional new impacts beyond those identified in the EIA, and will not increase the significance of impacts as defined in the EIA.

Based on the above, it can be concluded that the advantages of the proposed change outweigh the disadvantages from an environmental and technical perspective.

4.3. Requirement for Additional Mitigation as a Result of the Proposed Amendments

As required in terms of Regulation 32(1)(a)(iii), consideration was given to the requirement for additional measures to ensure avoidance, management and mitigation of impacts associated with the proposed change. Inputs provided by the avifauna, noise and visual specialist into this amendment motivation, conclude that the mitigation measures proposed within the EIA would be sufficient to manage potential impacts within acceptable levels. Additional management measures recommended by the bat specialist as a result of this proposed amendment must be included within the project EMPr. The EMPr was not approved in the EA (8 May 2015) and must therefore still be amended and submitted to DEA for final approval. These additional mitigation measures will be included in this updated EMPr.

5. PUBLIC PARTICIPATION

A public participation process is being conducted in support of a Part 2 application for amendment of the Environmental Authorisation for the Castle Wind Energy Facility in the Northern Cape. This process is being undertaken in accordance with Regulations 39 – 44 of GNR982.

This public participation includes:

- Release of this amendment motivation report for a 30 day public review period between **21 October 2016 and 21 November 2016** at www.savannahsa.com/projects. CD copies can be provided to stakeholders on request.
- Notification of registered I&APs regarding the availability of the amendment motivation report.
- Placement of an advert in the printed press
- Placement of site notices at the site on 17 October 2016.

Comments received during the public review process for this report will be included in the final submission to the DEA for consideration in the decision-making process.

6. CONCLUSION

Based on the specialist findings, it is concluded that the proposed amendments will not result in changes to the assessed impacts within the EIA. In addition, there are no new impacts identified as a result of the proposed amendment. The amendment in itself does not constitute a listed activity. The mitigation measures described in the original EIA document are adequate to manage the expected impacts for the project. Additional management measures recommended by the bat specialist as a result of this proposed amendment must be included within the project EMPr.

Taking into consideration the conclusions of the studies undertaken for the proposed amendments associated with the revised turbine specifications (as detailed in Appendix A – D), it is concluded that these amendments are considered acceptable from an environmental perspective.

APPENDIX A: NOISE SPECIALIST REPORT

APPENDIX B: VISUAL SPECIALIST REPORT

APPENDIX C: BAT SPECIALIST REPORT

APPENDIX D: BIRD SPECIALIST REPORT

APPENDIX E: PUBLIC PARTICIPATION DOCUMENTATION