

# Karreebosch Wind Energy Facility

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## Commissioned Opinion

The requirement for a “grazing area withdrawal agreement” as specified in the Environmental Authorization

DEA Reference: 14/12/16/3/3/2/807

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Commissioned by: Trusted Partners



Commissioned for: Karreebosch Wind Farm RF (Pty) Ltd



Opinion by: D. Balfour (*PhD*)

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Date: 28 July 2022

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# Background

## ENVIRONMENTAL AUTHORISATION HISTORY

Karreebosch Wind Farm RF (Pty) Ltd (the Applicant) applied for Environmental Authorisation (EA) for the proposed Karreebosch WEF in 2015. The original Environmental Impact Assessment (EIA) was undertaken in September of 2015 for up to 71 wind turbines with a hub height of up to 100m and a rotor diameter of up to 140m including associated infrastructure. Environmental authorisation (EA) for 65 turbines was granted on 29 January 2016 (EA Ref: 14/12/16/3/3/2/807). The project underwent subsequent amendments (EA Ref: 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2, 14/12/16/3/3/2/807/AM3) which included increases in the hub height (up to 125m), rotor diameter (up to 160m), blade length (up to 80m), and minor amendments to the wording of certain conditions of the authorisation, as well as an extension of the validity of the EA to 2026. The associated 132V overhead powerline (OHPL) and onsite 33/132kV substation are currently subject to a separate EA application process.

## KARREEBOSCH WEF PROJECT LOCATION

The Karreebosch WEF is located approximately 40km north of Matjiesfontein, and approximately 40 km south of Sutherland. The site falls within the Karoo Hoogland Local Municipality of the Namakwa District Municipality within the Northern Cape Province as well as the Laingsburg Local Municipality of the Central Karoo District Municipality and the Witzenberg Local Municipality of the Cape Winelands District Municipality within the Western Cape Province.

The Karreebosch WEF is currently authorised over seventeen (17) properties as per the original EA (14/12/16/3/3/2/807), however only the properties relevant to the WEF infrastructure are included in this amendment application. The proposed final layout of the Karreebosch WEF is located over thirteen (13) properties as highlighted in blue in the table below.

Table 1: Farm portions included in the Karreebosch WEF EA amendment (as per the original EA: 14/12/16/3/3/2/807).

FARM NAME AND NUMBER	21 DIGIT SG CODE	MUNICIPALITY/PROVINCE
Farm Roode Wal No. 187	C04300000000018700000	Karoo Hoogland LM / Northern Cape
Farm Appels Fontein No. 201	C04300000000020100000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Ek Kraal No. 199	C04300000000019900001	Karoo Hoogland LM / Northern Cape
Portion 2 (Nuwe Kraal) of Farm Ek Kraal No. 199	C04300000000019900002	Karoo Hoogland LM / Northern Cape
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Remainder of Farm Wilgebosch Rivier No. 188	C04300000000018800000	Karoo Hoogland LM / Northern Cape
Farm Rietfontein No. 197	C04300000000019700000	Karoo Hoogland LM / Northern Cape
Remainder of Farm Karreebosch No. 200	C04300000000020000000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Karreebosch No. 200 <sup>1</sup>	C04300000000020000001	Karoo Hoogland LM / Northern Cape
Farm Oude Huis No. 195	C04300000000019500000	Karoo Hoogland LM / Northern Cape
Portion 1 of Farm Karree Kloof No. 196	C04300000000019600001	Karoo Hoogland LM / Northern Cape
Remainder of Farm Brandvalley No. 75 <sup>2</sup>	C04300000000007500000	Laingsburg LM / Western Cape

<sup>1</sup> The existing access road connecting to the R354 which will be used as the main access point for the Karreebosch WEF will require minor road strengthening and modifications on Karreebosch 1/200. Although this main access road was included in the original EIA and layout assessed in 2015, the Karreebosch 1/200 property was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

<sup>2</sup> A portion of an existing access road that will require minor road strengthening falls on Brandvalley RE/75. This existing access road will only be used as a 4x4 access track and not as the main access route to the WEF. The full length of this access road was included in the original EIA and

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The Remainder of Bon Espirange 73	C04300000000007300000	Laingsburg LM / Western Cape
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## SURROUNDING AREA ENERGY PROJECTS

The South African government gazetted eight (8) areas earmarked for renewable energy development in South Africa. These areas are known as Renewable Energy Development Zones (REDZ) and this project falls within the Komsberg REDZ. The purpose of the REDZ is to cluster development of renewable energy facilities in order to streamline the grid expansion for South Africa, i.e., connect zones to one another as opposed to a wide scatter of projects. Therefore, a number of renewable energy developments within the surrounding area which have submitted applications for environmental authorisation (some of which have been approved). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The surrounding projects that have not already been awarded Preferred Bidder (PB) status under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid window 5 or the Risk Mitigation IPP procurement programme (RMIPPPP), are still subject to the REIPPPP bidding process or subject to securing an off taker of electricity through an alternative process. Some of the surrounding proposed WEFs secured EAs several years ago but have not obtained PB status (or a private off taker agreement) and as such have not been developed.

These existing surrounding projects of varying approval status have been detailed in the table and figure below. Given the site's location within the Komsberg REDZ, it is considered to be located within the renewable energy hub that is developing in this focus area.

Table 2: Renewable energy projects (by approval status) within a 30km radius of the Karreebosch WEF.

LABEL	DFFE REFERENCE	PROJECT TITLE	STATUS
1	12/12/20/1782/1/AM5	140MW Rietrug Wind Energy Facility near Sutherland, Northern Cape Province.	Preferred Bidder Round 5
2	12/12/20/1782/2/AM6	140MW Sutherland 1 Wind Energy Facility near Sutherland, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 5
3	12/12/20/1782/3/AM3	140 MW Sutherland 2 Wind Energy Facility near Sutherland, Northern Cape Provinces.	Preferred Bidder Round 5
4	12/12/20/1783/1/AM5	150MW Perdekraal (West)Wind Energy Facility, Western Cape Province.	Approved
5	12/12/20/1783/2/AM5	147MW Perdekraal (East) Wind Energy Facility, Western Cape Province.	Preferred Bidder Round 4, Operational
6	12/12/20/1988/1/AM6	140MW Roggeveld Phase 1 Wind Farm, North of Matjiesfontein, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 4, Operational

layout assessed in 2015. However, Brandvalley RE/75 was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

<sup>3</sup> No infrastructure associated with the Karreebosch WEF is located on Kranskraal 189 as indicated in the final layout. This property will therefore be removed from the EA.

7	12/12/20/2370/1/AM6	140 MW Karusa Wind Energy Facility, Phase 1, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
8	12/12/20/2370/2/AM6	140MW Soetwater Wind Farm Phase 2, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
9	12/12/20/2370/3/AM5	140MW Great Karoo Wind Energy Facility Phase 3, Karoo Hoogland Municipality, Northern Cape Province.	Approved
10	14/1/1/16/3/3/1/2318	310MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
11	14/12/16/3/3/1/2441	360MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
12	14/12/16/3/3/1/1976/1/AM3	226MW Kudusberg Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces.	Approved
13	14/12/16/3/3/1115	325MW Rondekop Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces	Approved
14	14/12/16/3/3/1/1977/AM3	183MW Rietkloof Wind Energy Facility near Matjiesfontein in the Western Cape Province.	Preferred Bidder Round 5
15	14/12/16/3/3/1/2542	200 MW Esizayo Wind Energy Facility Expansion near Laingsburg, Western Cape.	In Process
16	14/12/16/3/3/2/2009/AM1	Oya Energy Facility, between Matjiesfontein and Sutherland in Western and Northern Cape Provinces.	Preferred Bidder Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP)
17	14/12/16/3/3/2/826	140MW Gunsfontein Wind Energy Facility Karoo Hoogland Municipality, Northern Cape Province.	Approved
18	14/12/16/3/3/2/856 /AM4	275MW Komsberg West near Laingsburg, Western Cape Provinces	Approved
19	14/12/16/3/3/2/857/AM4	275 Komsberg East near Laingsburg, Western Cape Provinces.	Approved
20	14/12/16/3/3/2/900/AM2	140MW Brandvalley Wind Energy Facility, WITHIN THE Laingsburg and Witzenberg Local Municipalities in the Western and Northern Cape Province.	Preferred Bidder Round 5
21	14/12/16/3/3/2/962/AM1	140MW Maralla East Wind Energy Facility, Namakwa and Central Karoo District Municipalities, Western and Northern Cape Provinces.	Approved
22	14/12/16/3/3/2/963/AM1	140Maralla West Wind Energy Facility, Karoo Hoogland local Municipality, Northern Cape Province.	Approved
23	14/12/16/3/3/2/967/AM3	140MW Esizayo Wind Farm, Laingsburg Local Municipality Western Cape Province.	Approved
24	12/12/20/2235	10MW Inca Photovoltaic Facility near Sutherland, Northern Cape Province.	Approved

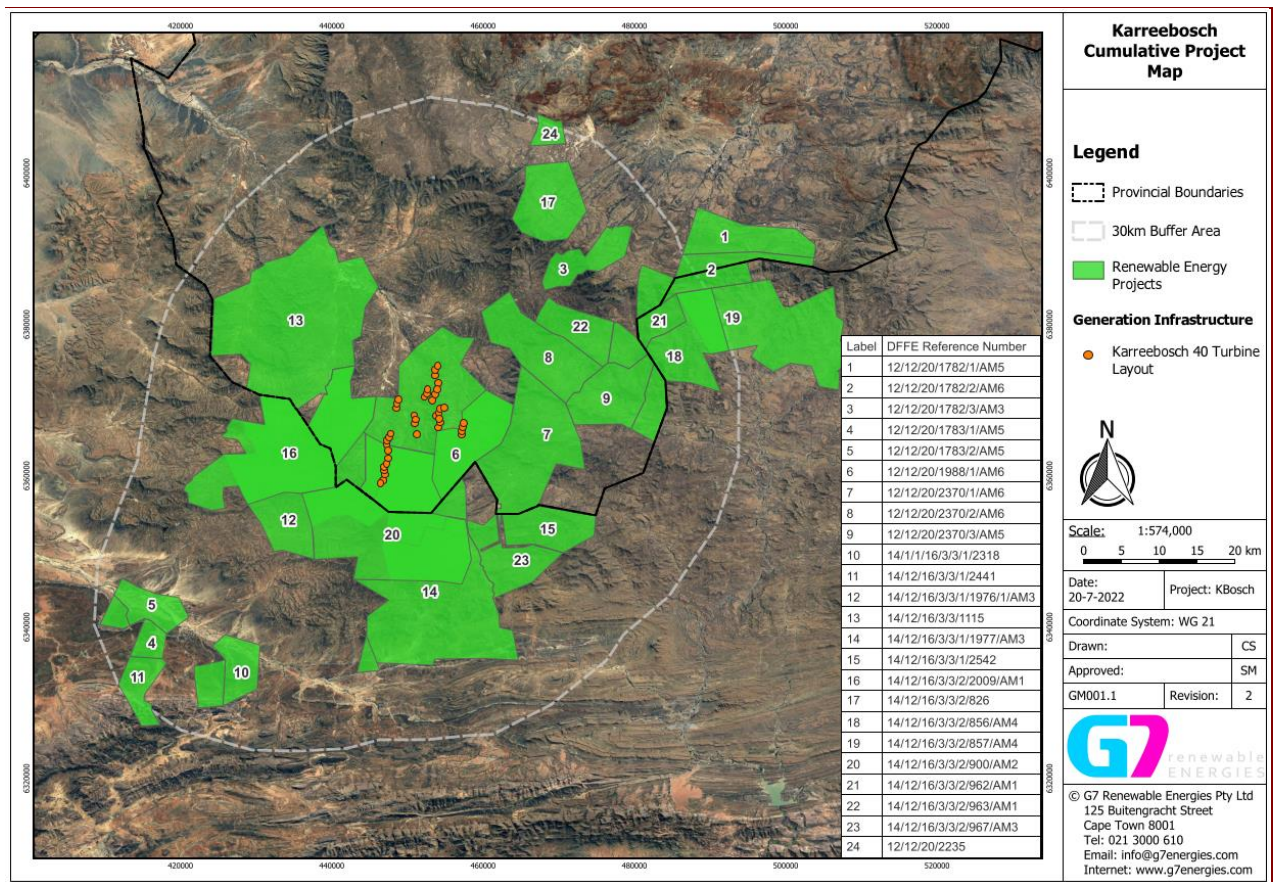


Figure 1: Renewable energy projects (by approval status) within a 30km radius of the Karreebosch WEF.

## The Brief

The Department of Department of Forestry, Fisheries and Environment (DFFE) issued an Environmental Authorisation<sup>4</sup> (EA, Ref: 14/12/16/3/3/2/807 and subsequent amendments 14/12/16/3/3/2/807/AM1, 14/12/16/3/3/2/807/AM2 & 14/12/16/3/3/2/807/AM3) in response to the Karreebosch Wind Farm and its associated infrastructure<sup>5</sup>. The site falls within the Karoo Hoogland Local Municipality and the Laingsburg Local Municipality in the Northern and Western Cape Provinces of South Africa respectively.

Conditions 19.2 and 37 of the EA<sup>6</sup> stipulates that a “grazing withdrawal area” of at least 1,300 ha must be set aside and that this area must be fenced and kept free of grazing by livestock for at least 20 years. The origins of this recommended action is the Fauna and Flora Specialist<sup>7</sup> report (FFSR) dated in 2014 and prepared to inform the Environmental Impact Assessment Report (EIAR).

<sup>4</sup> Environmental Authorisation issued in terms of the National Environmental Management Act, 1998: GN R. 9831984 and 985, date 29/01/2022.

<sup>5</sup> The first EA was granted on 29 January 2016 (14/12/16/3/3/2/807), with amendments to the EA issued on the 15 November 2018 (14/12/16/3/3/2/807/AM2) and 30 October 2019 ((14/12/16/3/3/2/807/AM3).

<sup>6</sup> Recommendation 37 on page 18 of the EA.

<sup>7</sup> Also termed the Ecology and Biodiversity Report

Selected text from the Conclusions and Recommendations section of the FFSR report (Todd, 2014 )reads as follows:

*Although off-site mitigation or offsets can be invoked to offset the impact of development, [...] on-site mitigation is viewed as the most practical and appropriate option for the current situation. As there is little scope for avoidance due to the limited extent of the ridges, improving the quality of the remaining habitat is a potential mitigation mechanism.*

*The priority high-elevation section of the ridges are identified below in Figure 13. Three different ridge sections have been identified as potential priority areas, but it is the larger central ridge that is considered the most important. The extent of the central ridge is approximately 3,000ha and the protection of this area from grazing would significantly improve the quality of the remaining habitat and is deemed to be the most suitable mitigation measure to address the likely impacts of the development on the ridgeline habitats. As this requires the co-operation of the landowners, it may not be possible to secure the entire area and a minimum of 1,300ha is identified as a minimum area required to “offset” the impact of the development. [...].*

*The rationale for setting these areas aside from grazing is that the ridgelines are currently grazed by livestock, and this has a visible impact on vegetation condition of these areas and also introduces alien species in sheep’s wool and dung. Setting these areas aside from grazing would release the vegetation from grazing pressure and improve the quality of the habitat for fauna as well as grazing sensitive species.*

The final EIAR<sup>8</sup> recommends that:

*Feasible mitigation measures as recommended by the fauna and flora specialist should be implemented. This includes releasing grazing pressure along priority ridgelines in an effort to improve habitat quality and species diversity and reduce the long-term impact of the development on listed and protected plant species.*

The brief was to review and critically analyse available and relevant documentation, undertake a site assessment and to express an opinion on:

- a) The merits and scientific integrity of the recommendation as expressed by the Fauna and Flora Specialist (Todd, 2014) which were included as Conditions 19.2 and 37 of the EA via the EIAR;
- b) The logical relationship (or lack thereof) between the described concern and the proposed remedy;
- c) The likely efficacy of the proposed remedy to achieve the desired outcome; and
- d) The practical implications of implementing the proposed remedy.

## Approach

The documents provided were reviewed and a site visit to each of the three ridges identified for wind turbine placement were undertaken. From this the opinions in relation to the four points (a-d) detailed above were developed.

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<sup>8</sup> Titled the “Final Impact Assessment Report”.

# Opinion

## Point a)

The FFSR (Todd, 2014) does not provide a) ecological evidence (e.g., species plot data or site based observations), b) reputable ecological referencing, or c) logical ecological reasoning as to why the ridgetops in general and specified ridgetops in particular are considered to be priority areas within the project site. In essence the text that establishes the ridges as important (not priorities) is contained in Section 3.2 (bottom of page 18):

*“The ridges are the most important habitats at the site since the turbines will be located on the ridges and the majority of the footprint would be along the ridges”.*

There is thus no clear ecological reason presented for the assertion that ridges should be seen as priorities. The logic is that the ridges will be impacted most as they will be used most, and for this reason they are priorities. The above quote continues:

*“[...]. In general, the eastern ridges can be considered more sensitive than the western ridges as [they] contain a significantly higher abundance of species of conservation concern as well as sensitive plant communities”.*

Referring to the above quote, it appears that the presence of species of conservation concern determines if a ridge should be classed as “sensitive”. There is little indication of the levels of congruence between the extent of “sensitive” plant communities and priority areas on the ridges. From the information provided the eastern ridges are identified as being more “sensitive” than the western ridges, as they have “significantly” greater numbers of species of conservation concern, although only 3 are listed as having been seen on site. At the same time, approximately 35% or more species are listed for the western ridges than for the eastern ridges (see pages 18, 19 and 20) and the final recommendations (fourth paragraph under heading 5. Conclusions and Recommendations<sup>9</sup>) suggest that the central ridge is the priority ridge. This information is not interpreted further for the reader, but it is clearly inconsistent and thus difficult to understand.

Other points are unclear or confusing, e.g., Appendix 1 lists plant species of conservation concern that are “known to occur in the vicinity of the Karreebosch project site”. What is meant by vicinity is not stated and although 35 species are listed in Appendix 1, only 4 are labelled as having been confirmed as being present at the project site<sup>10</sup> although not necessarily within the development footprint. How should one interpret this information, particularly when in the “Ridges Section” eight species of conservation concern are listed.

Lastly, new concepts, not previously mentioned are introduced in Section 5. Conclusions and recommendations. This is not good practice – the logic should have been established in the text and synthesized and summarized in the last section. This adds to a sense of unstructured thinking on the part of the specialist.

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<sup>9</sup> It is not useful to give a page number as the numbering has become inconsistent in the document at this point.

<sup>10</sup> Puzzlingly on page 24 (3.3 Listed and protected plant species) 8 species of conservation concern are listed.

In summary

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Ultimately, there is little to no substantiation for the assertion that the ridges are more sensitive than other areas and their claimed status as priority areas is also not substantiated (with the exception of some rocky outcrop areas), and the merits of the arguments and the scientific integrity of the recommendation, as expressed by the Fauna and Flora Specialist (Todd, 2014), based on the text of the report are highly questionable.

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### **Point b)**

The land that is being considered for the proposed Karreebosch WEF and associated infrastructure is small livestock farmland that has likely been used for this purpose for 150 years or more. In the absence of a windfarm, it is likely that the land will continue being used for this purpose for the near to medium term (5 to 20 years). The impact of grazing on the vegetation is clearly independent of the proposed development.

The recommended intervention, that of establishing a livestock grazing free area, possibly spread over three ridges, that functions for 20 years aims to remedy a perceived environmental harm that has no link to the proposed development. Neighbouring farms with no development have no similar obligation.

In summary

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The only relationship between the described concern and the proposed remedy is that the potential impact of the development footprint is being used to trigger the implementation of an action (the implementation of the grazing free area for 20 years) which is perceived to serve the conservation interests of portions of the ridgetop vegetation.

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### **Point c)**

The annual precipitation for the broad project area historically ranges between 200 and 400 mm per annum i.e., ecologically it is an arid landscape. Arid systems typically display episodic plant recruitment, survival and growth dynamics that remain poorly understood other than to say that all four dynamics are dependent on site-level rainfall events and their timing, volume and seasonality, as well as on post rainfall conditions such as temperature and grazing pressure. Site-level habitat recovery, which is reliant on individual plant recovery, also generally plays out over considerably longer time periods than one would experience in a mesic rainfall area. The reversal of 150 years of grazing of unknown historical intensity, is impossible to foresee but under current and past climatic regimes it is likely to require upwards of 50 years as opposed to 20 years to achieve. How this will play out under known climate change scenarios which suggest that the proposed development site is likely to gradually receive less and less mean annual rainfall over the next 50 years is unknown, but it is very unlikely that the process will speed up.

The purpose of implementing the zero grazing areas is stated to be to *“release the vegetation from grazing pressure and improve the quality of the habitat for fauna as well as grazing sensitive*



*species*". No target is set or metric for success mentioned, suggesting that holding a 1,300ha area free of sheep for 20 years could be an end in its own right – which is unsubstantiated.

What complicates the question further is that the recommended stocking density for the landscape by the Department of Agriculture, Land Reform and Rural Development ranges between 45 and 55 hectares per Large Stock Unit (LSU; or a cow equivalent). If this figure is conservatively converted to a density for sheep by multiplying by 4 (a factor of six is commonly used) that results in a stocking density for sheep of 11 to 14ha per sheep or 7 to 9 sheep per km<sup>2</sup>. The Karreebosch WEF site is 320km<sup>2</sup> which means that at currently recommended agricultural densities there could be between approximately 2,240 and 2,880 sheep on the project site. During the one-day site assessment, approximately 50-60% of the site was observed/visible, between 100 and 150 sheep were counted. It was noted that all sheep observed were all grazing on the lowlands the landscape, and not the upper mountain slopes or mountain ridges. Although this figure likely changes over time as animals are introduced and removed, it is clear that current stocking rates are already lower than recommended and potentially substantially so. When walking on the ridges more signs of baboon scat than sheep droppings were observed. This places a question mark over the need to reduce densities to zero.

In summary

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As no measurable target is set for the intervention, it is not possible to evaluate the value of the intervention in numerical terms. Will the intervention contribute in some undefined manner to the conservation of the vegetation? The above information suggests that this is far from certain and that more insight into what is actually happening at a stocking rate and an ecological level is required before such a recommendation is adopted and implemented. However, this is separate to the expected impacts of the development of the WEF.

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### **Point d)**

With the underlying information and understanding for the proposed intervention i.e., constructing and maintaining a 1,300ha fenced grazing exclusion site (or set of exclusion sites) for 20 years being so thin, the implementation of such a recommendation will be impractical and challenging. The guidance is too thin. Additionally, upwards of eight farms will need to be involved to implement the grazing withdrawal area and that will complicate matters to some extent.

In summary

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The recommendation to establish a 1,300h sheep fenced exclusion area and to maintain it for 20 years is a weakly justified and impractical intervention and that it should be removed from the Environmental Authorisation. The recommendation is based on weak evidence and scientific logic.

As such it the opinion of the specialist that the requirement for a non-grazing plan should not form part of the Environmental Authorisation (EA - 14/12/16/3/3/2/807) and that the following conditions should be removed from said Environmental Authorisation in their totality:

Condition 19.2: *“The grazing withdrawal area agreement as per condition 37”*; and

Condition 37: *“The grazing withdrawal area recommended by the Ecological Specialist must form part of the Lease Agreement between the holder of this authorization and the landowners. A minimum of 1300 ha must be set aside for the grazing withdrawal area; this area must be fenced and not grazed by livestock for at least 20 years. A copy of this agreement must be included in the EMPr”*.

If you have any queries with regards to the above opinion, please contact me directly.

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D. Balfour

Caryn Clarke  
Environmental Manager  
Karreebosch Wind Farm (Pty) Ltd  
5th floor, 125 Buitengracht Street,  
Cape Town 8001, SOUTH AFRICA

Dear Caryn,

**CONSIDERED OPINION**  
**KARREEBOSCH WIND ENERGY FACILITY – NON-GRAZING PLAN**

**ENVIRONMENTAL AUTHORISATION HISTORY**

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The Karreebosch WEF is currently authorised over seventeen (17) properties, as per the original EA (14/12/16/3/3/2/807) and as described in the table below. The properties highlighted in grey in the table below are relevant only to the proposed 132kV Karreebosch Overhead Powerline, which is subject to a separate application for Environmental Authorisation. These properties are therefore not affected by the proposed amended Karreebosch WEF final layout. Thus, only the properties relevant to the WEF infrastructure are included in this amendment application. The proposed final layout of the Karreebosch WEF is located over thirteen (13) properties as highlighted in blue in the table below.

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2	12/12/20/1782/2/AM6	140MW Sutherland 1 Wind Energy Facility near Sutherland, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 5
3	12/12/20/1782/3/AM3	140 MW Sutherland 2 Wind Energy Facility near Sutherland, Northern Cape Provinces.	Preferred Bidder Round 5

<sup>1</sup> "The existing access road connecting to the R354 which will be used as the main access point for the Karreebosch WEF will require minor road strengthening and modifications on Karreebosch 1/200. Although this main access road was included in the original EIA and layout assessed in 2015, the Karreebosch 1/200 property was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

<sup>2</sup> A portion of an existing access road that will require minor road strengthening falls on Brandvalley RE/75. This existing access road will only be used as a 4x4 access track and not as the main access route to the WEF. The full length of this access road was included in the original EIA and layout assessed in 2015. However, Brandvalley RE/75 was omitted from the original application and was therefore not included on the original Environmental Authorisation (14/12/16/3/3/2/807).

<sup>3</sup> No infrastructure associated with the Karreebosch WEF is located on Kranskraal 189 as indicated in the final layout. This property will therefore be removed from the EA.

LABEL	DFFE REFERENCE	PROJECT TITLE	STATUS
4	12/12/20/1783/1/AM5	150MW Perdekraal (West)Wind Energy Facility, Western Cape Province.	Approved
5	12/12/20/1783/2/AM5	147MW Perdekraal(East) 2 Wind Energy Facility, Western Cape Province.	Preferred Bidder Round 4, Operational
6	12/12/20/1988/1/AM6	140MW Roggeveld Phase 1 Wind Farm, North of Matjiesfontein, Northern Cape and Western Cape Provinces.	Preferred Bidder Round 4, Operational
7	12/12/20/2370/1/AM6	140 MW Karusa Wind Energy Facility, Phase 1, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
8	12/12/20/2370/2/AM6	140MW Soetwater Wind Farm Phase 2, Karoo Hoogland Municipality, Northern Cape Province.	Preferred Bidder Round 4, Operational
9	12/12/20/2370/3/AM5	140MW Great Karoo Wind Energy Facility Phase 3, Karoo Hoogland Municipality, Northern Cape Province.	Approved
10	14/1/1/16/3/3/1/2318	310MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
11	14/12/16/3/3/1/2441	360MW Pienaarspoort Wind Energy Facility Phase 1, Witzenberg local Municipality, Western Cape Province.	Approved
12	14/12/16/3/3/1/1976/1/AM3	226MW Kudusberg Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces.	Approved
13	14/12/16/3/3/1115	325WM Rondekop Wind Energy Facility between Matjiesfontein and Sutherland in Western and Northern Cape Provinces	Approved
14	14/12/16/3/3/1/1977/AM3	183MW Rietkloof Wind Energy Facility near Matjiesfontein in the Western Cape Province.	Preferred Bidder Round 5
15	14/12/16/3/3/1/2542	200 MW Esizayo Wind Energy Facility Expansion near Laingsburg, Western Cape.	In Process
16	14/12/16/3/3/2/2009/AM1	Oya Energy Facility located near Laingsburg, Western and Northern Cape Provinces.	Preferred Bidder Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP)
17	14/12/16/3/3/2/826	140MW Gunsfontein Wind Energy Facility Karoo Hoogland Municipality, Northern Cape Province.	Approved
18	14/12/16/3/3/2/856 /AM4	275MW Komsberg West near Laingsburg, Western Cape Provinces	Approved
19	14/12/16/3/3/2/857/AM4	275 Komsberg East near Laingsburg, Western Cape Provinces.	Approved
20	14/12/16/3/3/2/900/AM2	140MW Brandvalley Wind Energy Facility, WITHIN THE Laingsburg and Witzenberg Local Municipalities in the Western and Northern Cape Province.	Preferred Bidder Round 5
21	14/12/16/3/3/2/962/AM1	140MW Maralla East Wind Energy Facility, Namakwa and Central Karoo District Municipalities, Western and Northern Cape Provinces.	Approved
22	14/12/16/3/3/2/963/AM1	140Maralla West Wind Energy Facility, Karoo Hoogland local Municipality, Northern Cape Province.	Approved
23	14/12/16/3/3/2/967/AM3	140MW Esizayo Wind Farm, Laingsburg Local Municipality Western Cape Province.	Approved
24	12/12/20/2235	10MW Inca Photovoltaic Facility near Sutherland, Northern Cape Province.	Approved

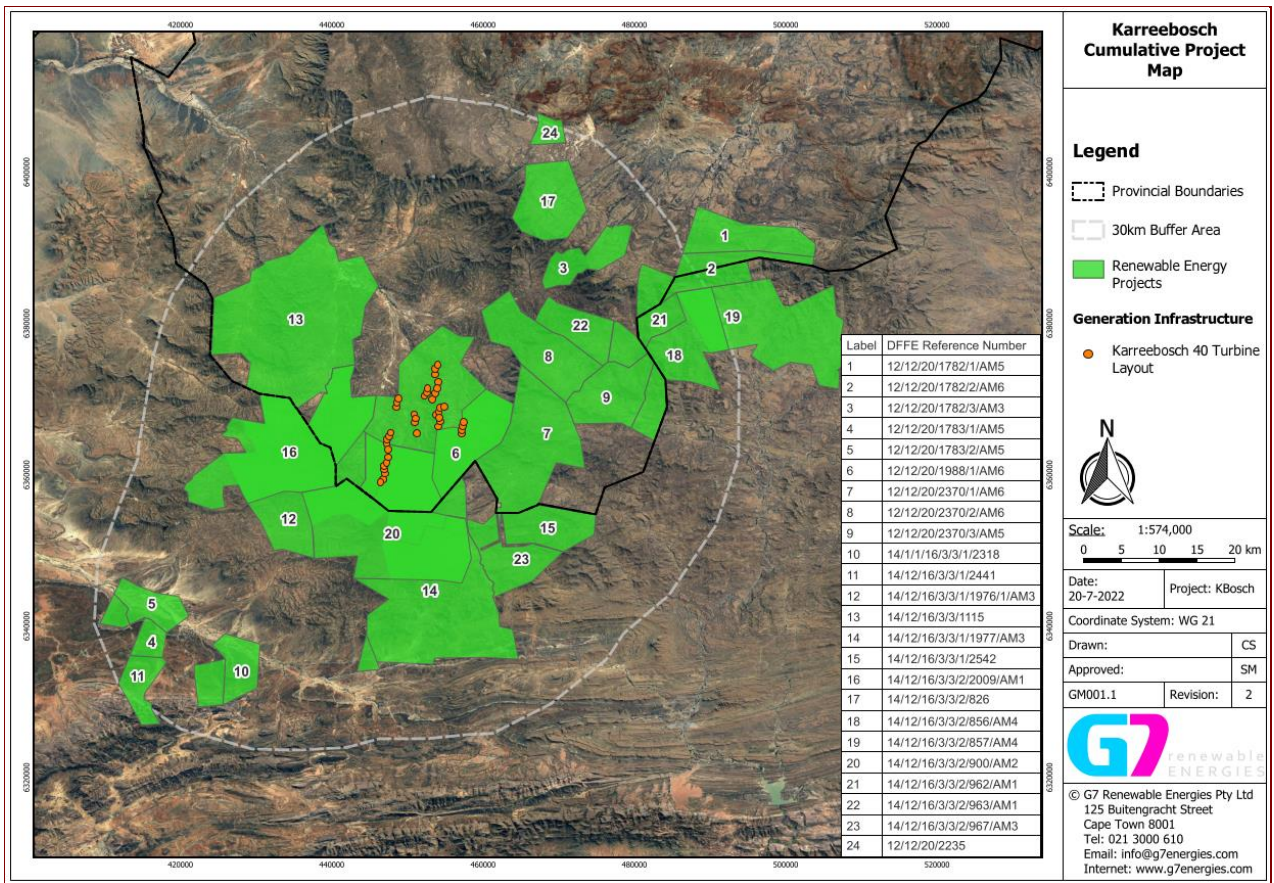


Figure 1: Renewable energy projects (by approval status) within a 30km radius of the Karreebosch WEF.

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**Trusted Partners** have extensive experience in the region inasmuch that they have been engaged on several other WEF's immediately adjacent to the Karreebosch WEF (KB-WEF) as well as numerous others in the region in preparing Biodiversity and Critical Habitats Assessment (International Finance Corporation: Environmental & Social Standard 6 (IFC PS 6)), Terrestrial Ecological Assessments (prepared under NEMA Protocols), Biodiversity Management Plans and various other supporting projects as Environmental & Social Risk Management Adviser.

This opinion is provided on the basis of information contained in:

- ENVIRONMENTAL IMPACT ASSESSMENT PROCESS FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT - PROPOSED CONSTRUCTION OF THE KARREEBOSCH WIND FARM AND ASSOCIATED INFRASTRUCTURE DEA REF. NO: 14/12/16/3/3/2/807 prepared by Savannah Environmental and dated September 2015;
  - APPENDIX D1 – FAUNA AND FLORA SPECIALIST REPORT FOR EIA prepared by Simon Todd Consulting and dated October 2014;
  - APPENDIX D2 – Mitigation Letter entitled KARREEBOSCH WIND ENERGY FACILITY AND PROPOSED MITIGATION MEASURES FOR TURBINES ALONG SENSITIVE RIDGES, dated September 2015;
  - APPENDIX G – SOIL, LAND USE, LAND CAPABILITY AND AGRICULTURAL POTENTIAL EIA REPORT prepared by Savannah Environmental and dated July 2015;
- KARREEBOSCH ENVIRONMENTAL AUTHORISATION (DEA REF 14/12/16/3/3/12807), dated JANUARY 01, 2016; and
- Various site Assessment and reports prepared by **Trusted Partners**:
  - TP210521-01B KARREEBOSCH WEF – TERRESTRIAL ECOLOGY REPORT dated October 2021
- TP210521-01 WSP EURONOTUS WEFs - KARREEBOSCH GRID CONNECTION TERRESTRIAL BIODIVERSITY REPORT DATED NOVEMBER 2021
- Numerous other Biodiversity reports on the adjacent:
  - ROGGEVELD WEF (DEA References: 12/12/20/1988/1/AM1, 12/12/20/1988/1/AM2, 12/12/20/1988/1/AM3, 12/12/20/1988/1/AM4, 12/12/20/1988/1/AM5, 12/12/20/1988/1/AM6),
  - BRAND VALLEY WEF (DEA References: 14/12/16/3/3/2/900, 4/12/16/3/3/2/900, 14/12/16/3/3/2/900/AM1, 14/12/16/3/3/2/900/AM2 (pending authorization in 2022), Overhead Powerline - 14/12/16/3/3/1/1591 ), and
  - RIETKLOOF WEF (DEA References: 14/12/16/3/3/2/899, 14/12/16/3/3/1/1977, 14/12/16/3/3/1/1977/AM1, 14/12/16/3/3/1/1977/AM1, 14/12/16/3/3/1/1977/AM2, 14/12/16/3/3/1/1977, 14/12/16/3/3/1/1977/AM3, Rietkloof Powerline 14/12/16/3/3/1/1590)

Figure 2 shows the current site layout plan.

### Ecological Setting of KB-WEF

The Karreebosch Wind Energy Facility (KB-WEF) and the associated infrastructure is located on a site ~40km north of Matjiesfontein and ~40km south of Sutherland. The site falls within the Karoo Hoogland Local Municipality (Namakwa District Municipality) in the Northern Cape and the Laingsburg Local Municipality (Central Karoo District Municipality) in the Western Cape. It must be noted that the Karreebosch Wind Farm is located within the Komsberg Renewable Energy Development Zone (REDZ) as determined by the Strategic Environmental Assessment for Wind and Solar Photovoltaic Energy in South Africa (2015 – CSIR/DEA) and formally gazetted on 16 February 2018 (GN 114).

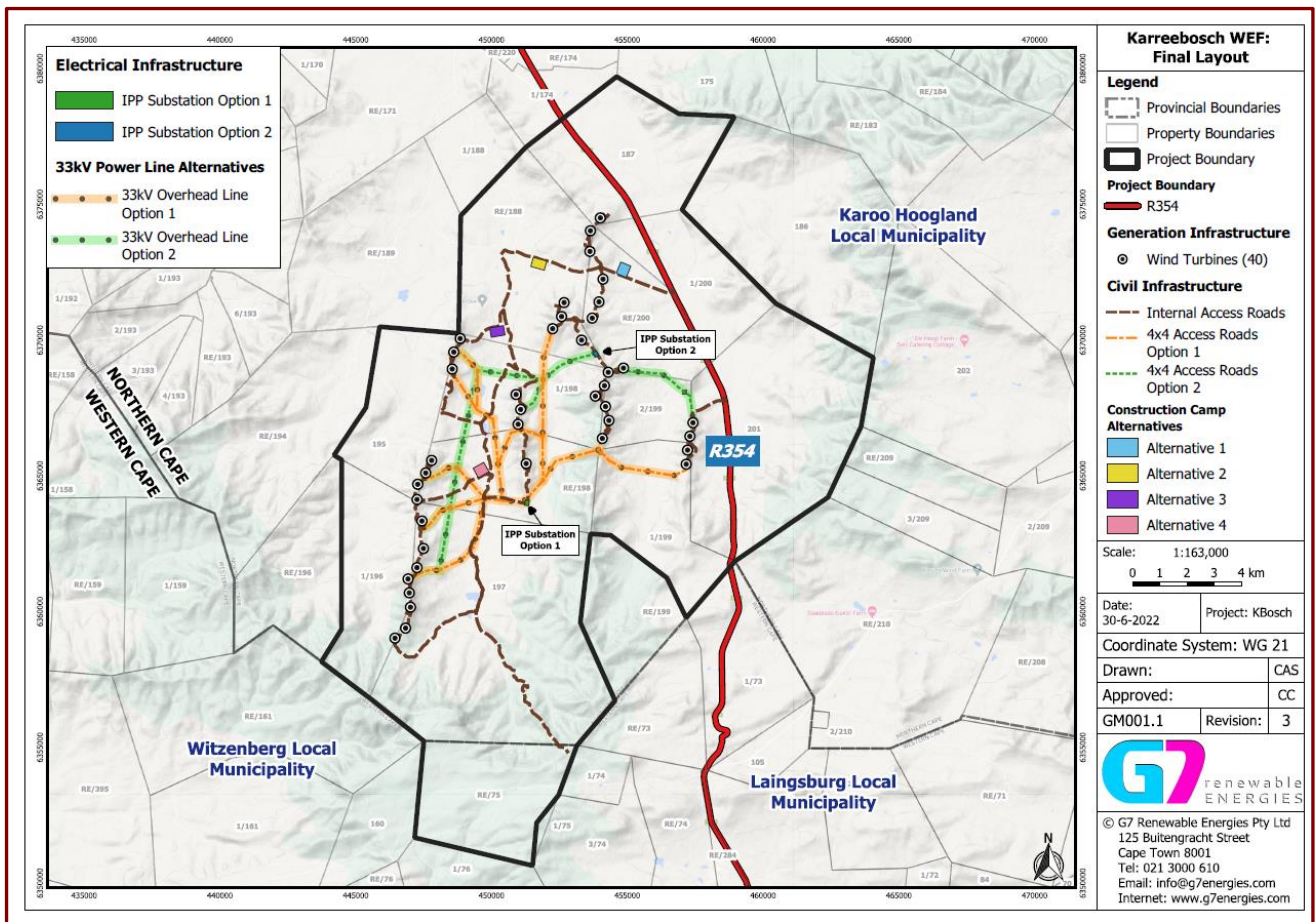


Figure 2: Karreebosch WEF development final layout plan.

The approved KB-WEF consists of the following (*this currently subject to a Part 2 EA Amendment application, final layout & EMPr approval process*):

- 65 wind turbines with a maximum generating capacity of 140MW;
- Permanent compacted hard standing areas (crane pads) and transformers per turbine;
- Temporary construction camp and laydown areas including an on-site batching plant;
- Access roads;
- Overhead 33kV powerlines and above and underground cabling;
- 33/132kV substation;
- Up to four 125m tall wind measuring lattice masts.

**Trusted Partners** recently prepared a report on the Terrestrial Ecology of the KB-WEF as required in the aforementioned EA's (as required for the Part 2 EA Amendment application, final layout & EMPr approval process), in order to ensure that the micro-siting of the turbines and power line has the least possible impact and all protected plant species impacted are identified. As a secondary outcome, a list of protected species as well as species suited to rescue/translocation was provided.

The Terrestrial Ecology of the KB-WEF is one of several Terrestrial Ecology reports **Trusted Partners** have undertaken for a series of adjacent WEFs within an overlapping Area of Influence. The general descriptions provided in the report are thus an overview of the broader area and contains information that has been summarised from separate but contiguous / overlapping site assessments in order to more effectively contextualise the broader environment and the Area of Influence as well as to better understand the 'bigger picture', since the natural environment is interconnected and is strongly influenced by the surrounding ecological dynamics.

The Terrestrial Ecological Assessment for the KB-WEF was undertaken in the time-period between August 30, 2021, and September 11, 2021, in support of the REIPPPP Bid Round 5 submission. However, the project was not awarded.



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The Level-of-Effort for the August/September 2021 Terrestrial Ecological Assessment was three persons, consisting of two Natural Scientists and one Technician. The on-site assessment was undertaken shortly after a particularly rainy period, which was evident in the notable flowering proliferation, which progressed throughout the site visit period. While the seasonal response of local flora does vary throughout the year, with certain species flowering during different seasons, the time during which the walkdown was undertaken is deemed to have been at a time that would most effectively identify the most species. Many geophytic species which may be dormant for large parts of the year were visible, if not flowering. It is possible that certain flora were not visible at the time of the on-site assessment. However, **Trusted Partners** has been on-site the KB-WEF and/or in the Koedoesberge Mountain on numerous occasions in different seasons since late 2019 and as such have a strong understanding of the ecology and its functioning.

A comprehensive list of references, including data sources as provided in Section 13 of the report (**Trusted Partners** Report: TP210521-01B Karreebosch WEF - Ecological DRAFT 20210007). Additional data sources that were utilised for the walkdown and report include the following:

- National (DFFE) Web Based Screening Tool – to generate the sites potential environmental sensitivity;
- National Vegetation Map 2018, Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019) – description of vegetation types, species (including endemic) and vegetation unit conservation status;
- National and Regional Legislation including Provincial Nature Conservation Ordinance. NEM:BA Threatened or Protected Species;
- Botanical Database of Southern Africa and New Plants of Southern Africa – lists of plant species and potential species of concern found in the general area;
- International Union for Conservation of Nature - Red List of Threatened Species;
- Animal Demography Unit Virtual Museum – potential faunal species;
- Global Biodiversity Information Facility – potential faunal species;
- Southern African Bird Atlas Project 2 – bird species records;
- National Red Books and Lists - mammals, reptiles, frogs, dragonflies & butterflies;
- National Freshwater Ecosystem Priority Areas assessment - important catchments;
- National Protected Areas Expansion Strategy and South Africa Protected Area database (2020) – protected area information;
- Northern Cape Protected Area Expansion Strategy (2017)
- Critical Biodiversity Areas of the Northern Cape (2016) – Bioregional Plan;
- Namakwa District Biodiversity Sector Plan (2008) – Bioregional Plan;
- Succulent Karoo Ecosystem Planning (2002);
- SANBI BGIS – All other biodiversity GIS datasets;
- Aerial Imagery – Google Earth, Esri, Chief Surveyor General (<http://csg.dla.gov.za>);
- Cadastral and other topographical country data - Chief Surveyor General (<http://csg.dla.gov.za>);
- Original Ecological Assessments conducted for the project, excluding bats and avifauna by Todd (2011, 2014, 2016, 2019);
- Critical Habitat and Biodiversity Assessments by **Trusted Partners** (2020); and
- Other sources include peer-reviewed journals, regional and local assessments and studies in the general location of the project and its area of influence, landscape prioritization schemes (Key Biodiversity Areas), systematic conservation planning assessments and plans, and any pertinent masters and doctoral theses, among others.

### General Terrestrial Biodiversity

It is evident from the site investigation that the vegetation units which represented within the project Area of Influence are transitional rather than distinct units. The Renosterveld complex, of which the Shale Renosterveld is recognised as one unit is clearly associated with the higher lying mountains which extend along the Roggeveldberge from the Hantam Karoo near Calvinia in the north-west to the Nuweveldberge between Fraserburg and Merweville in the north-east and extending southwards into the Koedoesberge towards Matjiesfontein. The higher-lying mountainous areas receives a higher rainfall compared to the surrounding

distinctly karroid areas, which promotes a less and distinctly wood succulent shrub and herbaceous component compared to the strongly succulent karroid vegetation.

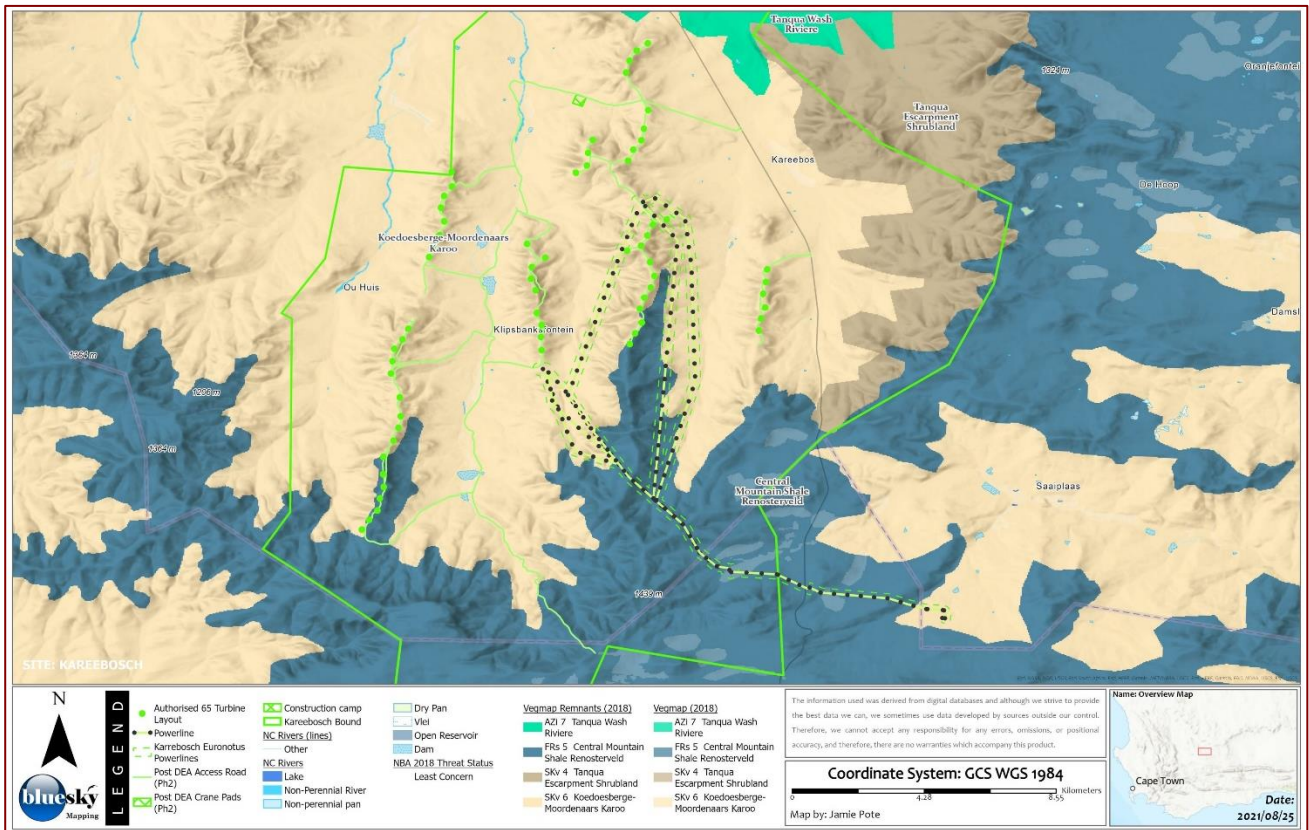


Figure 3: Karreebosch WEF – regional vegetation units. The proposed 132kV powerline and onsite substation is subject to a separate EA application process.

Note: The WEF layout shown here is as per the 2016 EA authorised layout and is only shown to depict the overall regional vegetation units. Current WEF layout is depicted in Figure 1.

The vegetation occurring within the area surrounding the site and Area of Influence is broadly according to the national vegetation classification and descriptions (National Vegetation Map 2018, Mucina & Rutherford (2006) and National Biodiversity Assessment (NBA, 2019)) for Central Mountain Shale Renosterveld on the higher mountains and slopes, transitioning with Koedoesberge-Moordenaars Karoo on the lower mountains and valleys in the south, east and west with strong Tanqua Karroo influences in the west and Tanqua Escarpment Shrubland in the north. Tanqua Wash Riviere elements are found encroaching towards the site from the west, into the lower lying valleys running south, north and westwards. It is further evident that the Koedoesberge-Moordenaars Karoo that is present on the west side of the project area has several dominant species not occurring on the south-eastern side, with appearance of species such as *Euphorbia hamata* suggesting that the vegetation unit in this area may be more closely aligned with the Tanqua Karroo than with the Moordenaars Karoo found to the east.

At least 50 mammal species potentially occur at the site (Skinner and Chimimba, 2005). The mammalian community is therefore relatively rich and due to the remote and inaccessible nature of the general area (and in particular the mountain ridges), probably has not been highly impacted by human activities. In general, the ungulates present at the site are likely to be fairly widespread. Springbuck are confined by fences and occur only where farmers have introduced them or allowed them to persist and should be considered as part of the farming system rather than as wildlife *per se*. Both Duiker (*Sylvicapra grimmia*) and Steenbok (*Raphicerus campestris*) are adaptable species that can tolerate high levels of human activity and are not likely to be highly sensitive to the disturbance associated with the development. Klipspringer (*Oreotragus oreotragus*) and Grey Rhebok (*Pelea capreolus*) are somewhat more specialized in their habitat requirements and make use of the upper slopes of the site. The Riverine Rabbit (*Bunolagus monticularis*) which is listed as Critically Endangered (IUCN 2010) and is regarded as the most threatened mammal in South Africa is known to occur within the broad area. Populations of this species occur between Sutherland and Fraserburg to the northeast as well as

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around Touwsriver to the southwest. Based on the available information, the habitat at the site does not appear to be suitable for this species and there are no known records from the area, indicating that it is highly unlikely that the Riverine Rabbit occurs at the KB-WEF project site.

There is a wide range of environments present for reptiles at the site, including rocky uplands and cliffs, open lowlands and densely vegetated riparian areas. As a result, the site has a rich reptile fauna which is potentially composed of 7 tortoise species, 20 snakes, 17 lizards and skinks, two chameleons and 10 geckos. The site falls within the range of the little-known Fisk's House Snake (*Lamprophis fiskii*) which is listed as Vulnerable and has usually been recorded in karroid sandy areas. This species may therefore occur within the lowlands of the site and as such would probably not be significantly impacted by the development especially given its nocturnal, largely subterranean and secretive nature. Several protected and listed lizard species are likely to occur at the site including the Namaqua Plated Lizard *Gerrhosaurus typicus* (Near Threatened), the Karoo Girdled Lizard *Cordylus polyzonus* (protected) and the Cape Crag Lizard *Pseudocordylus microlepidotus*. Since the Karoo Girdled Lizard and Cape Crag Lizard are associated with rocky outcrops, it is not likely that these species will be directly affected by the development if the turbines are not positioned in areas with steep slopes where such outcrops are likely to be located. The Namaqua Plated Lizard may be more common than believed (Alexander & Marais 2007) and occurs in karroid succulent veld where it digs burrows at the base of shrubs. This species is therefore it is unlikely that these species will be largely affected by the development provided that the turbines avoid steeper slopes with rocky outcrops, where practical/technological possible. Tortoises were relatively abundant at the site and many Angulate Tortoises, (*Chersina angulata*) were observed as were several Karoo Tent Tortoises (*Psammobates tentorius tentorius*).

An aggregating, ground-nesting bee (*Hymenoptera*) was observed at several places generally associated with lower-lying alluvial deposits. While it is not possible to accurately identify without collected specimens, it has been determined that it possibly within one of six bee families/subfamilies, based on the fact that they were ground-nesting on flat, non-friable soil with no turrets marking each nest; aggregating in a large population; and some photographed specimens appeared to have pollen on their bodies. These families/subfamilies are *Melittidae*, *Andrenidae*, *Colletidae*, *Halictidae*, *Megachilidae* (subfamily *Fideliinae*) and *Apinae* (Tribe *Anthophorini*). Based on the robustness of the bodies, it is more likely that they are Andrenids, Megachilids or in the *Apinae*, as the other groups mentioned above tend to have slimmer body designs. All of these groups are largely data-deficient, and it is thus difficult to find information on population sizes, ranges and conservation statuses. None the less, based on available literature sources, ground-nesting bees are vulnerable to any activities that will till the soil, such as agriculture or construction, or loss of their host plants from which they collect pollen or leaf material for nest provisioning. All of these groups are important pollinators, although undervalued because of the general focus on the African Honeybee as a pollinator. Since the bees are found in populations that are not confined to a single burrow, but occupy numerous burrows in a wider area, making relocation not feasible, together with their important ecological role as pollinators, these populations should be retained where identified, as they were found to be uncommon across the broader project Area of Influence.

Although there are no perennial rivers at the site, several of the larger drainage lines in the area were observed to contain rocky, sheltered pools that are likely to contain water on a permanent basis. Several wetlands with dense stands of sedges were also observed at the site and are likely to represent important amphibian habitats. Consequently, amphibians which require near-permanent water as well as those adapted to more arid conditions are likely to occur at the site. Nevertheless, only eight frog and toad species are likely to occur at the site, all of which are quite widespread species of low conservation concern.

### Summary points from Ecological Report by Simon Todd Consulting

In 2014, Savannah Environmental commissioned Simon Todd Consulting (STC) to prepare report entitled a FAUNA & FLORA SPECIALIST REPORT FOR EIA, for the then proposed KB-WEF. The report provided, *inter alia*, a:

- Introduction
- Methodology
- Description of the Affected Environment;
- Impact Assessment;
- Impact Assessment Summary;
- Conclusions and Recommendations;

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- Appendix 1: List of Plant Species;
  - Appendix 2: List of Mammals;
  - Appendix 3: List of Reptiles;
  - Appendix 4: List of Amphibians

The STC Report (2014) describes an Assessment Approach and Methodology that would provide: “A description of the broad ecological characteristics of the site ... in terms of patterns and processes.” Where patterns include “significant landscape features or rare or important vegetations associations”; and processes include “key ecological drivers of ecosystems such as fire, spatial components of ecological processes”

The STC Report (2014) also clearly states that “the site visit took place on the 10<sup>th</sup> and 11<sup>th</sup> of October 2014. The western ridges were accessed on foot at representative sites as there are no access roads to the ridgelines. Vegetation surveys were conducted along the ridges as well as lower down within the development footprint ... certain habitats such as rocky outcrops or wetlands were specifically searched for reptiles and amphibians.”

However, in 2.3 Limitations and Assumptions of the Study Approach, the STC report then reads “as the site has been visited on numerous occasions, a good temporal sample of the vegetation at the site has been obtained”... and “the western ridges are more arid than the eastern ridges” ... “the site is however relatively homogenous”

The STC Report states “... the protection of this area (i.e., mountain ridges) from grazing would significantly improve the quality of the remaining habitat and is deemed to be the most suitable mitigation measure recommended to redress the likely impacts of the development on the ridgeline habitats. The protection from livestock grazing of a minimum of 1300ha of priority habitat is identified as a minimum area required to counter the impacts of grazing...”

Critically the STC confirms that “... **the rationale for setting these areas aside from grazing would be to release the vegetation from grazing pressure ...**”

### Concluding Opinion

As indicated above **Trusted Partners** have over the past three years conducted numerous assessments on four WEFs on the Koedoesberge, as has STC across the same projects. Whilst **Trusted Partners** have sought to understand the Koedoesberge as a larger ecological domain and sought to align impact management practices across the various projects, STC has for some reason elected (without scientific basis as indicated herein) that a fenced non-grazing area should be established on the KB WEF – this on the basis that there is a perceived impact of overgrazing by sheep on the mountain tops ridges and not as a result of the development of the KB-WEF.

Given the above, it is the considered opinion of **Trusted Partners** that:

- The biodiversity across Koedoesberge cannot be managed on a piecemeal basis;
- The ecological functioning across the KB-WEF, the broader Koedoesberge, and the current farming practice appear to be in relative harmony with each other;
- Based on extensive assessment of KB-WEF (and the three adjacent WEF projects) **Trusted Partners** find no evidence whatsoever of overgrazing by sheep on the mountain slopes and especially not on top of the mountain ridges. **Trusted Partners** have not observed anything which would suggest that the various farms are in anyway overstocked or overgrazed;
- The only distinguishing ‘pattern’ **Trusted Partners** have observed on the mountain is that the numerous rocky cliffs and overhangs certainly provide for increased species diversity, but that such is specifically localized to these rocky areas. Overall vegetation profiling up the mountain slopes and onto the ridges is relatively homogenous in species composition. Any sub-variations hereto are associated with very localised changes in soil profiles and water availability and are not due to overgrazing by sheep;
- STC in their report clearly and irrevocably states **the reason for the non-grazing area is to release the desired 1300ha from grazing pressure** and not because of impact from the development of the KB-WEF. Thus, the establishment of a non-grazing area, as envisaged by STC, in no way provides any mitigation whatsoever to any impacts that are resultant from the KB-WEF. Nonetheless, it is improper to attempt to link the KB-WEF to a perceived impact from the farming practices.

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- STC has not presented any scientific evidence that, in any manner, endorses the setting aside of land for non-grazing for a period of 20 years so as to achieve the desired goal of benefiting the broader ecological functionality. In this arid region ecology, a period of twenty years is simply too short for any effective change in ecological functioning to be established **and** then after twenty years normal farm practice would just simply resume; i.e., a pointless and fruitless exercise from an ecological perspective. Any recovery of overgrazing in this ecology would take at least 50+ years to self-remedy;
  - Furthermore, short-term isolation of a parcel of land (or several parcels making up the 1300ha) will, by all reasonable scientific deduction, have no effect on the broader ecological function of the farms that make up the KB-WEF or the broader ecological functioning of the Koedoesberge mountains.
  - The conservation plan is especially punitive upon the landowner and fails to address matters such as:
    - Is the suggested 1300ha a single unit or multiple smaller units; what are the financial implications to the landowners?
    - Does excluding 1300ha from grazing land increase grazing pressure in other areas?
    - What are the scientific assessment criteria to determine if such land isolation is in fact having the desired impact?

In summary, the non-grazing plan mooted by STC and included in the Environmental Authorisation for the KB-WEF, i.r.o:

*Condition 19.2 The grazing withdrawal area agreement as per condition 37; and  
Conditions 37 The grazing withdrawal area recommended by the Ecological Specialist must form part of the Lease Agreement between the holder of this authorisation and the landowners. A minimum of 1300 ha must be set aside for the grazing withdrawal area; this area must be fenced and not grazed by livestock for at least 20 years. A copy of this agreement must be included in the EMPr;*

has been founded on weak scientific evidence, if any at all, causing the non-grazing plan to be a fatally flawed mitigation strategy and ecological management philosophy. As such, it is the considered opinion of **Trusted Partners** that there are exceptionally strong grounds for the removal of the non-grazing plan requirement (as per conditions 19.2 and 37 of the EA - 14/12/16/3/3/2/807) from the Environmental Authorisation in totality.

Whereas you may have any queries with regards to the above opinion, please contact me directly.

Yours sincerely



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**PARTNER**

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