

Visual Impact Assessment for Brandvalley Wind Energy Facility, Northern and Western Cape Provinces, South Africa

DEA Reference Number: 14/12/16/3/3/2/900/AM1

25 September 2018

To whom it may concern,

Brandvalley Wind Farm (Pty) Ltd wishes to modify their Environmental Authorisation for the 140 MW Brandvalley Wind Energy Facility as follows:

1. Increase the hub height to a possible maximum of 125m;
2. Increase the rotor diameter to a possible maximum of 160m.

The final turbine model selected may not actually have dimensions of 125m (hub height)/160m (rotor), but will not exceed these. For the purposes of this visual impact assessment, the maximum possible dimensions (i.e. 125m/160m) have been used in the viewshed analysis.

In the original Visual Impact Assessment (dated March 2016) the turbine dimensions used in the viewshed analysis were 120m/140m, resulting in a maximum possible blade tip height of 190m.

On the 15th of June 2018, I (Thomas King) was asked to make a statement regarding the impact of a proposed change in turbine dimensions to 120m/150m. The blade tip height in this scenario would have been 195m, only 5m higher than the 190m used in the original assessment, and a revised viewshed analysis was not deemed necessary.

However, a change in turbine dimensions to 125m/160m has now been proposed. These dimensions will result in a blade tip height of 205m. At the request of an I&AP, a revised viewshed analysis has been undertaken.

The operational phase impact relating to visual impacts was ***Impact 1: Impact of wind turbines on sensitive visual receptors***. This impact was rated as a **high (negative)** impact based on the following:

- The impact would last for longer than 20 years, which according to the rating scale used is considered permanent.

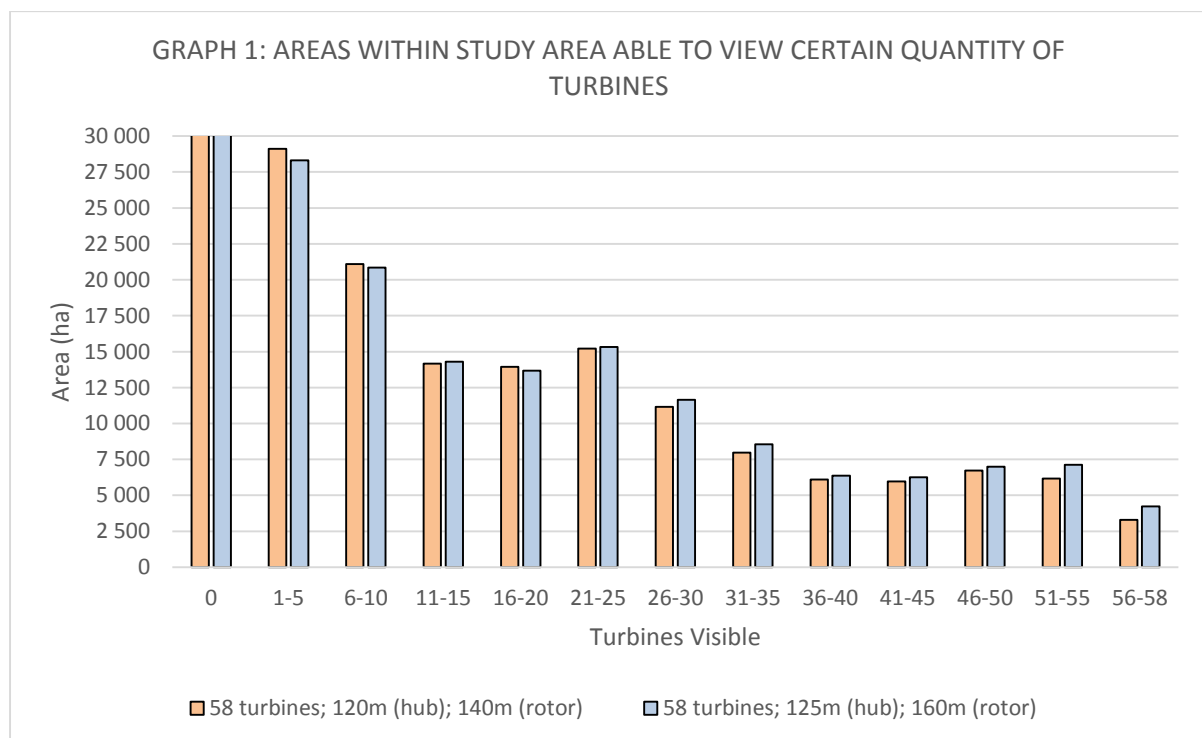
- The large size of the turbines, and the almost complete lack of tall vegetation which would provide some visual screening, means that turbines will be visible within the majority of the study area (defined as the farm portions upon which the turbines will be situated and an area within 20km of these farm portions).
- The impact was rated to be severe due to the strong contrast the turbines would introduce relative to the otherwise unmodified landscape.
- The impact will definitely occur if the turbines are built.

The Brandvalley layout has changed in two ways since the original 2016 analysis was done:

1. New turbine dimensions of up to 125m (hub height) / up to 160m (rotor diameter) have been proposed.
2. The number of turbines has been reduced from 70 to 58. A statement confirming the impact of 58 turbines was provided dated 2 August 2016

58 turbines with dimensions 120m/140m were approved for the Brandvalley WEF in the Environmental Authorisation issued on 23 November 2016. Graph 1 compares two layouts:

- The 58-turbine, 120m/140m layout approved in the Environmental Authorisation; and
- The 58-turbine, 125m/160m layout currently proposed.



Note that the columns for zero turbines visible are not shown on the graph above, as they will dwarf the other values and reduce the usefulness of the graph. Total area from which no turbines are visible based on 120m/140m dimensions is 148 336 ha. With 125m/160m dimensions, this is reduced to 145 602 ha. Figures used to produce this Graph 1 are attached as Appendix A.

The viewshed results reveal that, with the taller turbines proposed, there has been a reduction in area that will see zero turbines (-2 735ha) and an increase in all the other categories (except 1-5, 6-10, and 16-20). The area that will see between 56 and 58 turbines has increased from 3 299ha to 4 225ha (+926ha). The general conclusion that can be drawn related to the increase in turbine height is that within the study area (the area within 20km of the farm portions involved in the project which is 289 260ha), smaller areas will see fewer turbines, and larger areas will see more turbines. The average increase in areas that will see more turbines is 450ha (max: 972ha, min: 136ha, median: 292ha).

COMMENT ON CUMULATIVE IMPACTS

At the time of the original assessment (March 2016) there were 13 records for wind or wind and solar projects within 50km of the Brandvalley WEF. Each record had a unique DEA Reference Number (see Table 6.6 of the Visual Impact Assessment, March 2016). The source for this information was the most recent version (at the time) of the South African Renewable Energy EIA Application Database (dataset title: REEA_OR_2015_Q4.shp).

The most recent version of this database, REEA_OR_2018_Q2.shp (1), lists 39 records for the same types of projects within the same area. After removing 6 duplicates (i.e. records with the exact same DEA Reference Number), the number of records is 33.

However most of these new records have come about as a result of amendments or splits from the original project. For example: a project with the DEA Reference Number 12/12/20/XXXX after being split into two projects has become 12/12/20/XXXX/1 and 12/12/20/XXXX/2. The table in Appendix A provides more detail in this regard. The only new WEF appears to be the Rietkloof WEF (DEA Reference: 14/12/16/3/3/2/899) which was considered at the time of the original assessment, since that assessment was done concurrently with the Brandvalley WEF assessment. As a result, the cumulative impact remains as originally assessed: high (negative).

CONCLUDING REMARKS

There are no new mitigation measures suggested as a result of the proposed amendment to 125m/160m dimensions. The mitigation measures suggested in the original visual assessment remain unchanged, as does the impact assessed: which remains high (negative).

An objection was lodged to the current application from Mr. van der Spuy representing the landowner of Zeekoegat 96. Therefore, further details are provided specific to this property. Parts of the farm Zeekoegat will see more turbines with the proposed layout compared to the approved layout. The change in number of turbines visible (Figure 1) and the total number of turbines visible (Figure 2) are displayed below. Being between 15km (nearest border of farm) and 25km (furthest border of farm) from the turbines will result in them being quite indistinguishable during the day. But at dawn, dusk and at night, the flashing red lights situated on the hub will be clearly visible at this distance. A mitigating factor is that Civil Aviation Authority requirements for this area require that turbines are fitted with pilot activated red lights and will only flash when the aircraft passes, not constantly.

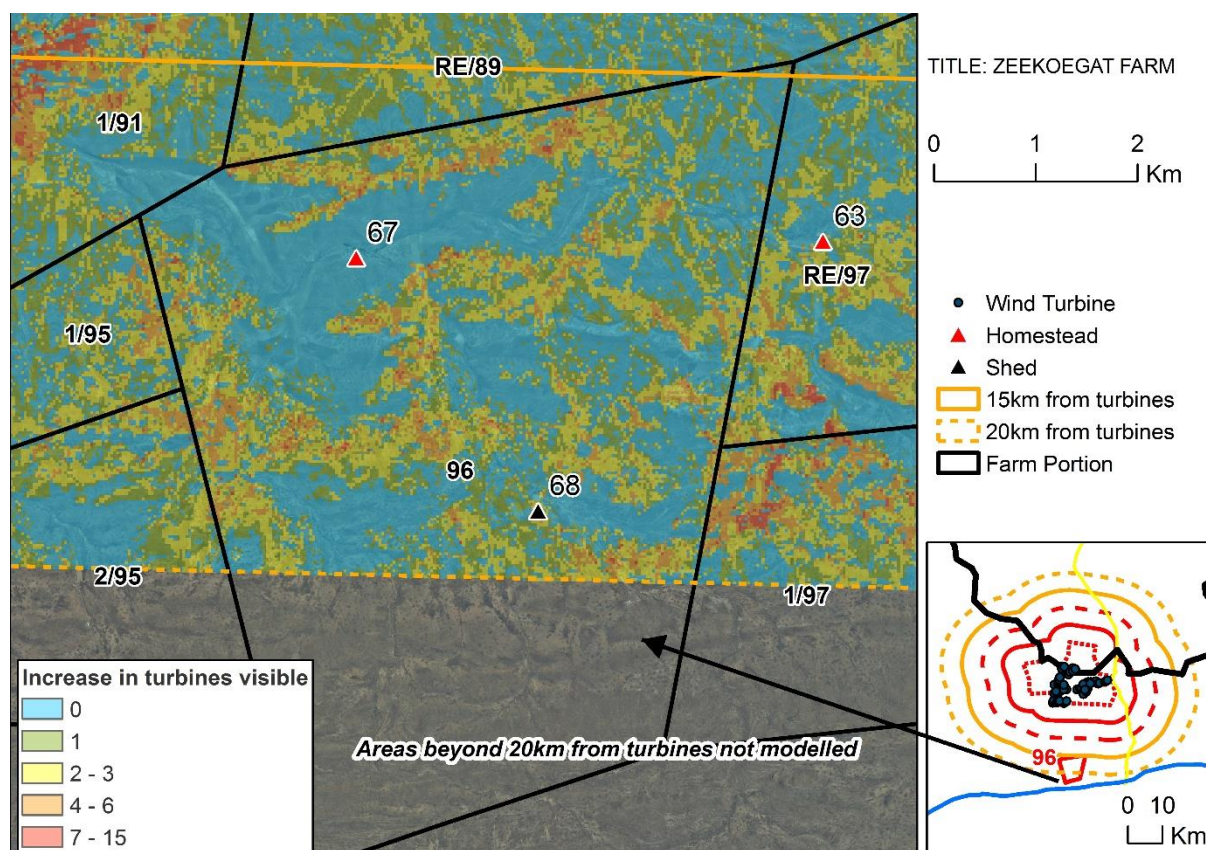


FIGURE 1: CHANGE IN NUMBER OF TURBINES VISIBLE FOR PROPOSED LAYOUT COMPARED TO APPROVED LAYOUT, ZEEKOEKAT FARM (FARM NUMBER 96).

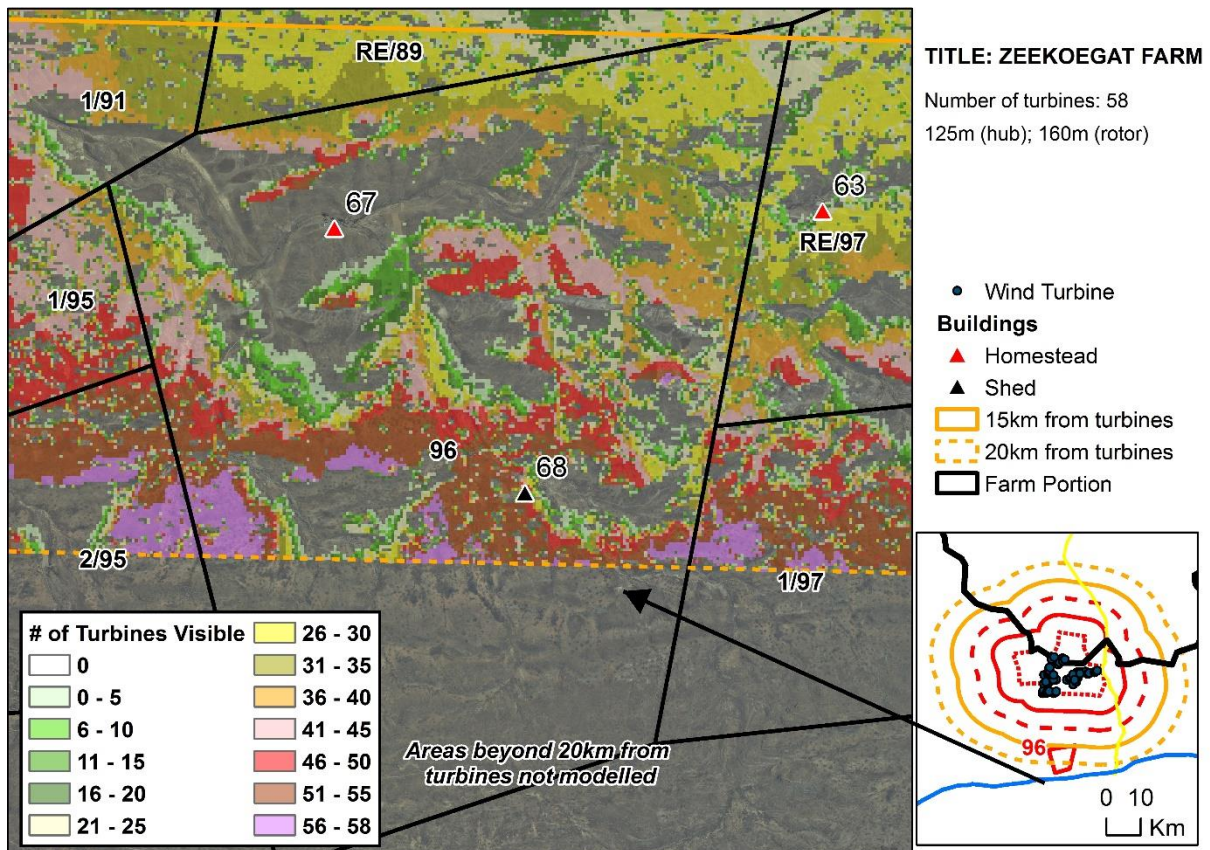


FIGURE 2: TURBINES VISIBLE FOR PROPOSED LAYOUT, ZEEKOEKAT FARM (FARM NUMBER 96).

REFERENCES

1. **Affairs, Department of Environmental.** EGIS. [Online] Department of Environmental Affairs, July 05, 2018. [Cited: September 24, 2018.]
[https://egis.environment.gov.za/data_egis/data_download/current.](https://egis.environment.gov.za/data_egis/data_download/current)

APPENDIX A – FIGURES USED TO PRODUCE GRAPH 1

Turbines Visible	AREA (ha) 58 turbines; 120m (hub); 140m (rotor)	AREA (ha) 58 turbines; 125m (hub); 160m (rotor)
0	148 336	145 602
1-5	29 118	28 314
6-10	21 098	20 855
11-15	14 162	14 298
16-20	13 947	13 681
21-25	15 207	15 323
26-30	11 163	11 642
31-35	7 975	8 556
36-40	6 108	6 379
41-45	5 965	6 257
46-50	6 723	6 999
51-55	6 158	7 130
56-58	3 299	4 225
Σ	289 260	289 260

APPENDIX B – COMPARISON OF VIEWSHEDS

APPENDIX C – RENEWABLE ENERGY APPLICATIONS (WIND AND WIND + SOLAR) WITHIN 50km OF THE BRANDVALLEY WEF STUDY AREA

REEA_OR_2015_Q4* - DEA Reference Number	REEA_OR_2018_Q2** - DEA Reference Number	Notes
12/12/20/1782	12/12/20/1782	
	12/12/20/1782/1	
	12/12/20/1782/2	
	12/12/20/1782/3	
	12/12/20/1782/AM1	
12/12/20/1783/1	12/12/20/1783/1	
12/12/20/1783/2	12/12/20/1783/2	
12/12/20/1783/2/AM1	12/12/20/1783/2/AM1	
	12/12/20/1783/2/AM3	
12/12/20/1787	12/12/20/1787	
12/12/20/1966	12/12/20/1966	
	12/12/20/1966/A2	
	12/12/20/1966/AM4	
12/12/20/1988	12/12/20/1988	
	12/12/20/1988/1/AM1	
	12/12/20/1988/1/AM2	
	12/12/20/1988/1/AM3	
	12/12/20/1988/2	
12/12/20/2228	12/12/20/2228	
12/12/20/2370	12/12/20/2370	
12/12/20/2370/1	12/12/20/2370/1	
	12/12/20/2370/1/AM1	
12/12/20/2370/2	12/12/20/2370/2	
	12/12/20/2370/2/AM1	
12/12/20/2370/3	12/12/20/2370/3	
	12/12/20/2370/3/AM1	
14/12/16/3/3/2/395	14/12/16/3/3/2/395	

REEA_OR_2015_Q4* - DEA Reference Number	REEA_OR_2018_Q2** - DEA Reference Number	Notes
	14/12/16/3/3/2/807	Kareebosch WEF, a phase of the greater Roggeveld WEF (12/12/20/1988)
	14/12/16/3/3/2/807/AM1	
	14/12/16/3/3/2/826	A branch of Gunstfontein WEF (14/12/16/3/3/2/395)
	14/12/16/3/3/2/856	A branch of Komsberg West WEF (12/12/20/2228)
	14/12/16/3/3/2/899	Rietkloof WEF
	14/12/16/3/3/3/395	A branch of Gunstfontein WEF (14/12/16/3/3/2/395)

Total

13

33

Records

* Records from REEA_OR_2015_Q4.shp within 50km of Brandvalley WEF study area

** Records from REEA_OR_2018_Q2.shp within 50km of Brandvalley WEF study area – six
duplicates have been removed