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Ref: Haha Haga WEF Change

Coastal & Environmental Services
67 African Street
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Attention: Ms. Caroline Evans

Dear Madam

SPECIALIST STUDY: NOISE IMPACT ASSESSMENT: PROPOSED AMENDMENT – HAGA HAGA WIND ENERGY FACILITY: CHANGE OF WIND TURBINE LAYOUT AND SPECIFICATIONS

The above-mentioned issue as well as report TEC-HHWF/ENIA/201711-Rev 2 is of relevance.

I conducted an Environmental Noise Impact Assessment (ENIA) during 2017 for the proposed Haga Haga Wind Energy Facility (WEF). The potential noise impact was evaluated using a sound propagation model with conceptual scenarios were developed for construction and operational phases.

The output of the **unmitigated** construction and operational modelling indicated a potential noise impact risk with the significance being:

- of medium significance if the access roads are constructed at night;
- of high significance due to construction traffic at night; and
- of potential medium significance if the wind turbines operate at night (due to a noise level exceeding 45 dBA at NSD18 and NSD33).

The developer of the Haga Haga WEF has since optimized the layout (proposed new layout superimposed on the previously evaluated layout illustrated on **Figure 1**) of the facility, locating the wind turbines at optimal locations and changing the Wind Turbine Generators (WTGs) specifications as defined below:

Component	Currently Authorized	Proposed Amendment
Number of Wind Turbines	42 turbines	36 turbines
Hub Height	134 m	180 m

Rotor Diameter	150 m	200 m
Tip Height	200 m	280 m
Storage Area	140 000 m^2	No change requested
Roads	410 000m^2 (6 m wide)	425 000m^2 (8 m wide)
Battery Energy Storage System	None	Proposed on "Remainder of Storage Area" footprint

It should be noted that the change in wind turbine specifications such as the wind turbine hub height and rotor diameter does not relate to sound power emission levels, which depends on the model and make of a wind turbine. For the same model and make, a change in specifications such as hub-height and rotor diameter have an insignificant impact on sound power emission levels. Therefore, there is no advantage or disadvantage in terms of acoustics by changing the wind turbine specifications such as turbine hub height as well as rotor diameter. By changing the wind turbine model and make to a wind turbine with a lower sound power emission levels will have a significant advantage on acoustics (reduced noise emissions). However, changing the wind turbine model or make to a wind turbine with a higher sound power emission level will similarly increase the operational noise levels and the potential noise impact significance.

The wind energy market is fast changing and adapting to new technologies as well as site specific constraints. Optimizing the technical specifications can add value through, for example, minimizing environmental impact and maximizing energy yield. As such the developer has been evaluating several turbine models, however the selection will only be finalized at a later stage once the most optimal wind turbine is identified (factors such as meteorological data, price and financing options, guarantees and maintenance costs, etc. must be considered). As such the developer cannot commit to a specific wind turbine model, but it should be noted that the previous noise impact assessments did consider a worst-case scenario, using a wind turbine that have a very high noise emission level.

The proposed layout:

- reduce the total number of wind turbines which will reduce the cumulative noise level;
- the layout removed some of the wind turbines around NSD18 and NSD19, resulting in a reduction in noise levels at NSD18 (to less than 45 dBA);
- projected maximum noise levels increased slightly at NSD19 (less than 1 dB). The new layout was modelled and the projected noise level will be less than 45 dBA (using the sound power emission levels of 108.5 dBA re 10^{-12} w) at NSD19; and
- the noise levels at NSD33 will still exceed 45 dBA (46 dBA) as with the previous report.

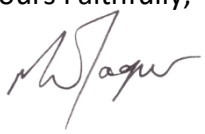
Therefore, considering the proposed locations of the WTGs and the potential noise impact, it is my opinion that:

- the change will not increase the projected noise levels at any significant levels and will not increase the significance of the noise impact;
- a full noise impact assessment will not be required and the recommendations as contained in the previous document will still be valid;
- the cumulative noise impact will not change, as there are no new or proposed wind turbines (from a different WEF), located within 2,000m from identified NSDs that will cumulatively increase the noise levels;
- there are no new limitations or assumptions.

An updated noise impact assessment will not be required and the findings, mitigation measures and recommendations as contained in the previous document (report TEC-HHWF/ENIA/201711-Rev 2) will still be valid, subject that the developer use a wind turbine with a sound power emission level less than 108.5 dBA (re 10^{-12} watt). In terms of noise, this amendment will not affect the conclusion of the noise study and the revision is acceptable.

Should you require any further details, or have any additional questions, please do not hesitate to call me on the above numbers.

Yours Faithfully,



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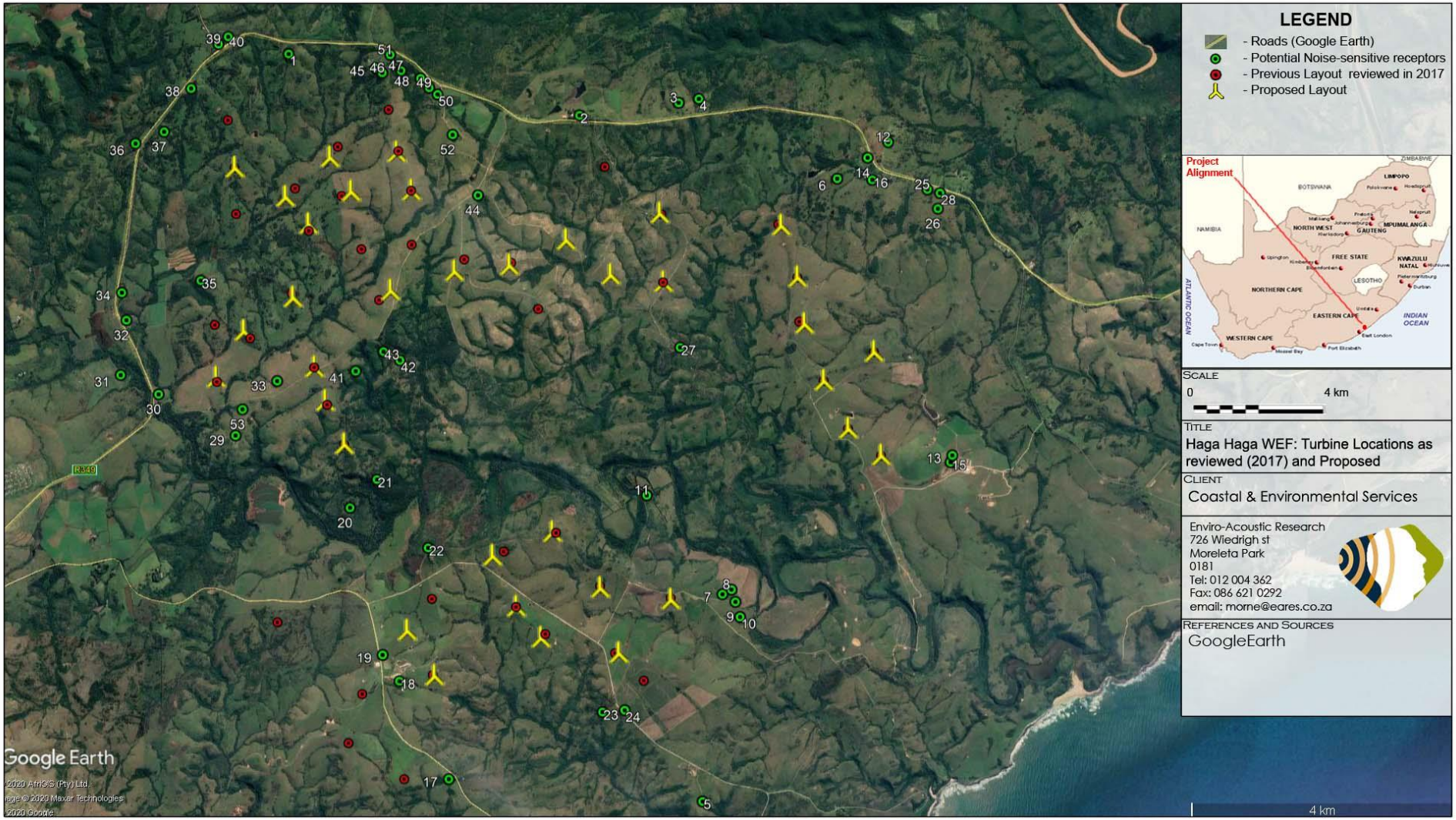

Figure 1: Layout previously evaluated as well as the proposed WTG locations