

14 September 2020

Caroline Evans
CES
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Dear Ms Evans

RE: PROPOSED AMENDMENTS TO APPROVED HAGA-HAGA WIND ENERGY FACILITY

1. Introduction and terms of reference

Subsequent to the granting of Environmental Authorisation (EA) for the proposed Haga Haga Wind Energy Facility (WEF) in the Eastern Cape Province, the developer has proposed some changes to the original turbine layout and specifications, as summarised in Table 1, and indicated in Figure 1.

A preliminary geotechnical report was prepared for the previously approved development by Outeniqua Geotechnical Services (OGS, 2017). The environmental consultant appointed by the developer for the proposed amendments, CES, has appointed OGS to review the original geotechnical report in light of the proposed revisions and provide comment on:

- a. Effect on current impacts;
- b. Effect on mitigation measures (including any new conditions based on new policy or guidelines);
- c. Effect on current EA Conditions (including any new conditions based on new policy or guidelines); and
- d. Effect on cumulative impacts.

Table1: Proposed amendments

COMPONENT	CURRENTLY AUTHORISED	PROPOSED AMENDMENT
Facility output	150MW	No change
Number of turbines	42	36
Hub Height m	134	180
Rotor diameter m	150	200
Tip Height m	200	280
Turbine output MW	3.2 to 5	No change
Turbine base footprint m ²	996	No change
Hard Stand Area m ²	3700	No change
Storage area m ²	140000	No change
Roads m ²	410 000	425 000
Substation m ²	11000	No change
Laydown Area m ²	10000	No change
Permanent Office m ²	5000	No change
Temporary Construction m ²	10000	No change
Remainder of Storage Area m ²	104000	No change
Total Footprint ha	74.7232	73.4056
Battery storage	None	New addition on "Remainder of Storage Area" footprint

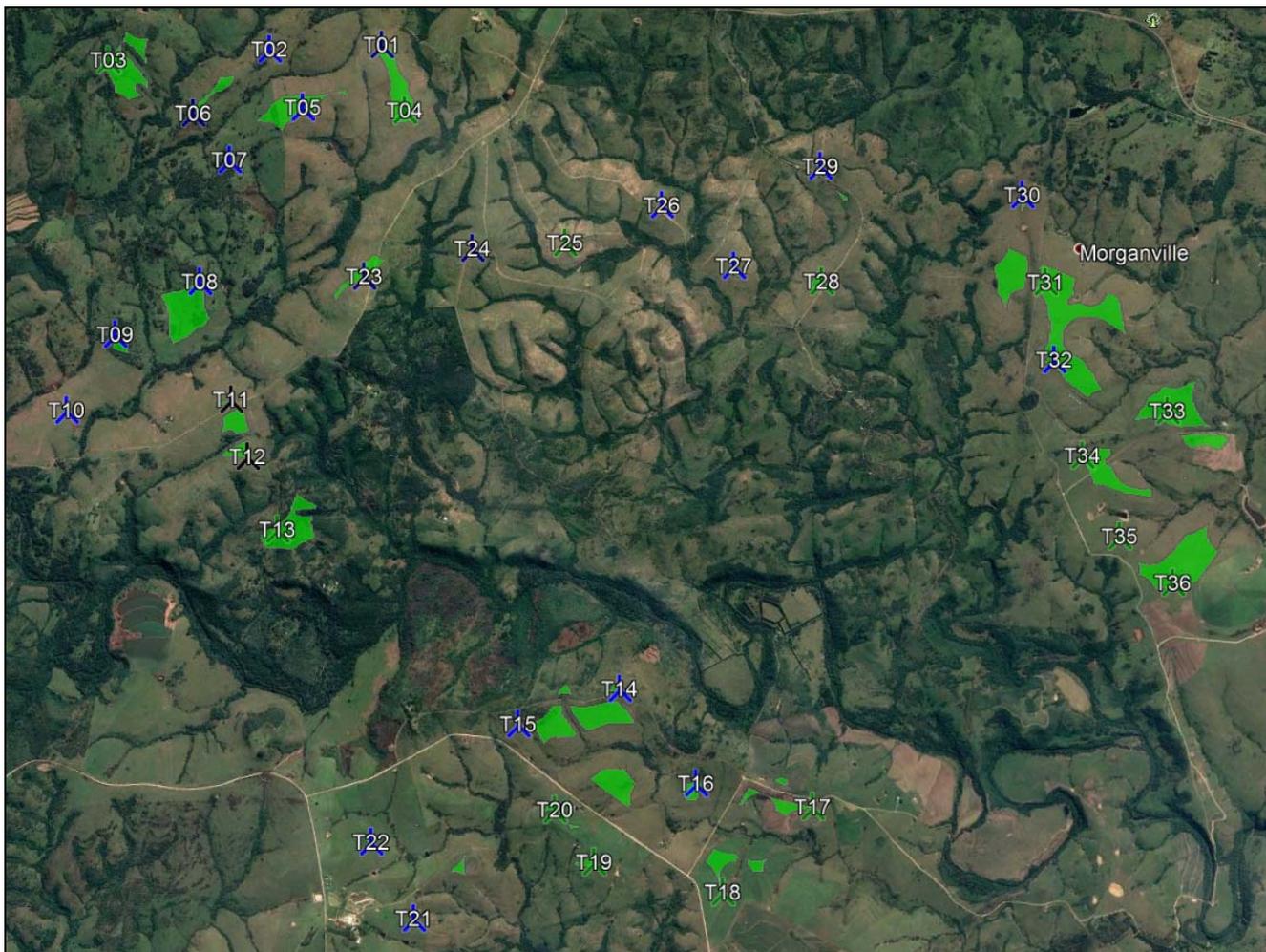


Figure 1: Proposed revised site layout showing positioning of 36 turbines

2. Previous assessments

The preliminary geotechnical report prepared by OGS (OGS, 2017) described the general geology and geotechnical conditions of the receiving environment. The assessment defined suitable areas for development and highlighted potential constraints and possible geotechnical risks associated with the proposed original development layout and specifications. The report concluded that the geology of the site was generally suitable for the proposed development, and also provided preliminary recommendations for the engineering design. In terms of environmental impacts, the main constraints identified in the report related to topographical features, including steep slopes, natural drainage lines and areas of poor drainage which relate to potential erosion and/or unstable ground.

Through the EA process, which incorporated other specialist studies, several zones of low environmental sensitivity or “buildable areas” were identified on the site, which were deemed suitable to accommodate wind turbines.

3. Assessment of impacts of proposed amendments

The proposed amendments of turbine positions within the identified buildable areas are generally suitable. Specific attention was drawn to the proposed turbine position T15, which was located on a moderate slope (estimated 1v:6h to 1v:4h) near a natural drainage line (see Fig 2). Following several discussions with the developer, this turbine was shifted slightly westward to a more suitable location further up the slope and away from the adjacent drainage line to a position outside the recommended 50m buffer zone. The turbine position remains on a moderate slope (1:6) and some engineering challenges may be encountered in the design, such as excessive cut-to-fill operations, erosion control, embankment stability, foundation design, etc. The turbine position is, however, suitable in terms of the environmental impacts. All other proposed turbine positions are deemed to be suitable with negligible additional impacts.

Other amendments include changes in the road layout, although this is unlikely to carry any significant additional impact.

The changes in potential impacts of the proposed infrastructure amendments are assessed in Table 2.

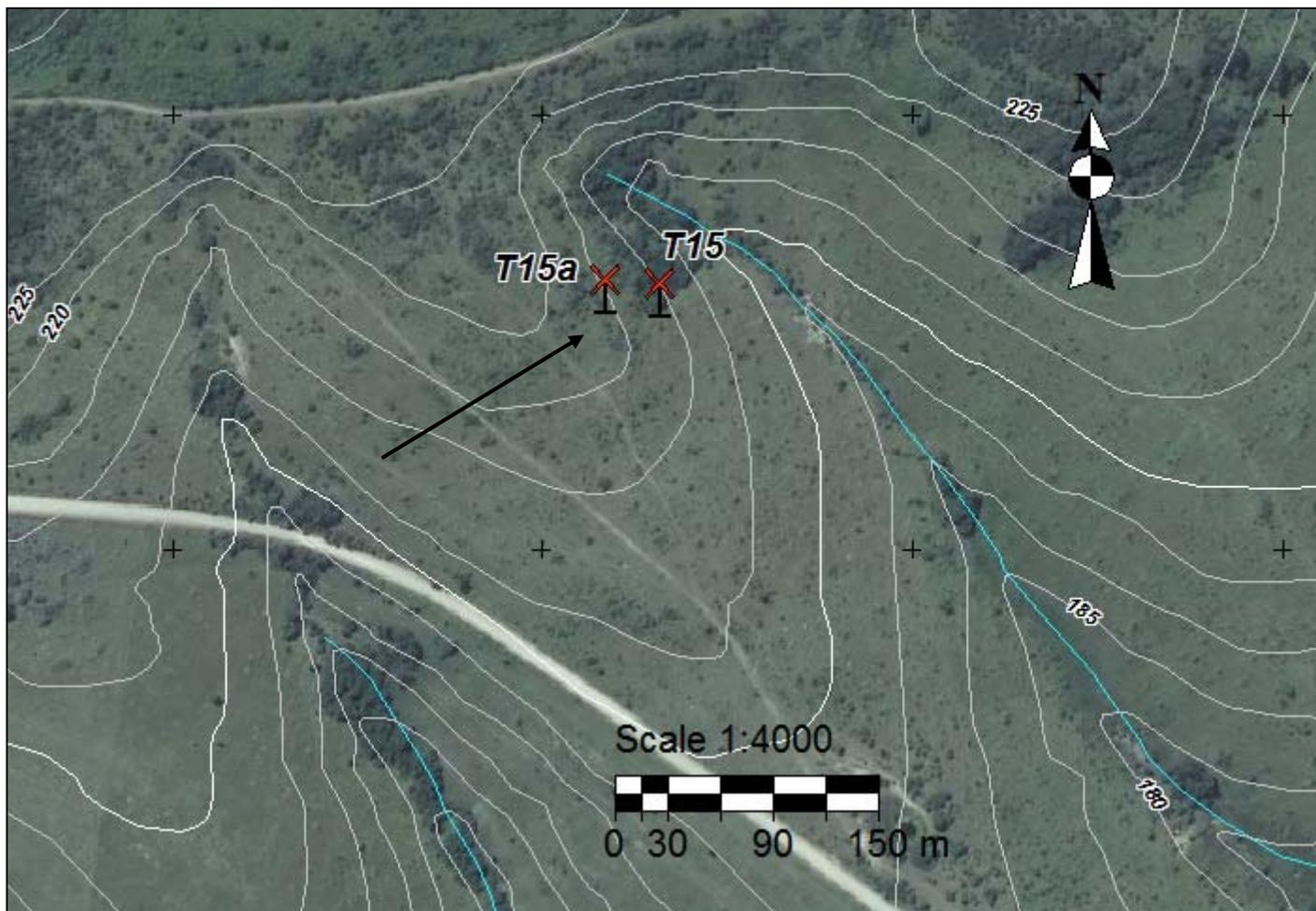


Figure 2: New position T15a

Table 2: Assessment of impacts of proposed amendments

<i>Component</i>	<i>Authorised</i>	<i>Amendment</i>	<i>Direct impacts</i>	<i>Cumulative impacts</i>
Hub Height m	134	180	Negligible negative	Negligible negative
Rotor diameter m	150	200	Negligible negative	Negligible negative
Tip Height m	200	280	Negligible negative	Negligible negative
No of Turbines	42	36	Minor positive	Minor positive
Turbine base area m ²	996	996	No change	No change
Hard Stand Area m ²	3700	3700	No change	No change
Storage area m ²	140000	140000	No change	No change
Roads m ²	410 000	425 000	Negligible negative	Negligible negative
Substation m ²	11000	11000	No change	No change
Laydown Area m ²	10000	10000	No change	No change
Permanent Office m ²	5000	5000	No change	No change
Temporary Construction m ²	10000	10000	No change	No change
Remainder of Storage Area m ²	104000	104000	No change	No change
Total Footprint ha	74.7232	73.4056	Negligible positive	Negligible positive

4. Conclusions

The proposed amendments do not present any significant change in the current or cumulative geological/geotechnical impacts other than those identified in the original assessment.

Yours faithfully

A handwritten signature in black ink, appearing to be 'Iain Paton', written in a cursive style.

Iain Paton Pr Sci Nat Pr Tech Eng

References

Outeniqua Geotechnical Services (OGS). 2017. Preliminary Geotechnical Report. Proposed Haga Haga Wind Energy Facility in the Eastern Cape Province of South Africa. Unpublished Internal Report.