

NATURA VIVA cc
Palaeontological Impact Assessments & Heritage Management,
Natural History Education, Tourism, Research

Attn: Ms Thalita Koster
Savannah Environmental
PO Box 148, Sunninghill
Gauteng, 2157

Date: 3 October 2019

PALAEONTOLOGICAL HERITAGE RESOURCES COMMENT:

**Part 2 Amendment for the authorized Zen Wind Farm near Saron, Drakenstein
Magisterial District, Western Cape**

A desktop palaeontological heritage assessment for the Zen Wind Farm near Saron, Western Cape submitted by Almond (2013) concluded as follows:

The construction of the proposed Zen Wind Energy Facility is not considered to pose a serious threat to local fossil heritage because the Malmesbury Group bedrocks and overlying mantle of Late Caenozoic superficial sediments (terrace gravels, alluvium, soils etc) are of very low palaeontological sensitivity.

It is therefore recommended that, pending the discovery of significant fossil remains, exemption from further specialist palaeontological studies and mitigation be granted for this alternative energy development.

Should any substantial fossil remains (e.g. stromatolites, trace fossils, shells, vertebrate bones and teeth) be encountered during excavation, however, these should be reported to Heritage Western Cape for possible mitigation by a professional palaeontologist.

The project proponent, ZEN Wind Farm (Pty) Ltd, subsequently received an Environmental Authorisation for the development on 03 November 2016 (as subsequently amended on 11 February 2019).

The following further amendments of the authorised wind farm are now being proposed by FE Bonne Esperance (Pty) Ltd as a Part 2 Amendment to the EA:

- Reduction in the number of turbines from 46 to 27;
- Increase rated power of turbines from 3 MW to up to 6 MW per WTG;
- Increase rotor diameter from 122 m to up to 165 m;
- Increase hub height from 110 m to up to 140 m;
- Increase in the overall capacity of the wind energy facility from 140 MW to up to 147 MW;
- Potential increase to dimensions of the crane pad and laydown area (storage area per turbine);

NATURA VIVA cc (Reg. No. 2000/019296/23)
Members: Dr J.E. Almond (British)(Managing), M.L. Tusenius
P.O. Box 12410 Mill Street, CAPE TOWN 8010, RSA
Tel / Fax: +27 (21) 462 3622 E-mail: naturaviva@universe.co.za

- Increase in the concrete foundation from 20m x 20m x 4m to 25m x 25m x 6m;
- Update of the layout; and
- Change the holder of the EA.

In the author's opinion, given the overall low to very low palaeontological sensitivity of the project area, the proposed Part 2 amendments to the authorised Zen Wind Farm will not cause a marked change in the impact significance of the proposed development in terms of palaeontological heritage. The conclusions reached in the original palaeontological assessment report for this project are unchanged and there are no objections on palaeontological heritage grounds to authorisation of the proposed Part 2 Amendment of the Zen Wind Farm.

Should important new fossil remains - such as vertebrate bones, horn cores and teeth, plant-rich lenses or layers, fossil shells, fish remains or dense fossil burrow assemblages - be exposed during the construction phase, the responsible Environmental Control Officer should alert Heritage Western Cape as soon as possible (HWC Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za). This is so that appropriate action can be taken in good time by a professional palaeontologist at the developer's expense. Palaeontological mitigation would normally involve the scientific recording and judicious sampling or collection of fossil material as well as of associated geological data (*e.g.* stratigraphy, sedimentology, taphonomy). The palaeontologist concerned with mitigation work will need a valid fossil collection permit from HWC and any material collected would have to be curated in an approved depository (*e.g.* museum or university collection). All palaeontological specialist work should conform to international best practice for palaeontological fieldwork and the study (*e.g.* data recording fossil collection and curation, final report) should adhere as far as possible to the minimum standards for Phase 2 palaeontological studies developed by SAHRA (2013).

Recommendations for Chance Fossil Finds are summarized in tabular form in Appendix 2 and should be incorporated into the Environmental Management Programme (EMPr) for the wind farm development.



Dr John E. Almond
Palaeontologist, *Natura Viva* cc

KEY REFERENCES

ALMOND, J.E. 2013. Proposed Zen Wind Energy Facility near Saron, Drakenstein Magisterial District, Western Cape. Recommended exemption from further palaeontological studies, 7 pp. *Natura Viva* cc, Cape Town.

APPENDIX 1: SPECIALIST CV

Dr John Almond has an Honours Degree in Natural Sciences (Zoology) as well as a PhD in Palaeontology from the University of Cambridge, UK. He has been awarded post-doctoral research fellowships at Cambridge University and in Germany, and has carried out palaeontological research in Europe, North America, the Middle East as well as North and South Africa. For eight years he was a scientific officer (palaeontologist) for the Geological Survey / Council for Geoscience in the RSA. His current palaeontological research focuses on fossil record of the Precambrian - Cambrian boundary and the Cape Supergroup of South Africa. He has recently written palaeontological reviews for several 1:250 000 geological maps published by the Council for Geoscience and has contributed educational material on fossils and evolution for new school textbooks in the RSA.

Since 2002 Dr Almond has also carried out palaeontological impact assessments for developments and conservation areas in the Western, Eastern and Northern Cape, Limpopo, Northwest, KwaZulu-Natal, Mpumalanga and the Free State under the aegis of his Cape Town-based company *Natura Viva cc*. He has served as a long-standing member of the Archaeology, Palaeontology and Meteorites Committee for Heritage Western Cape (HWC) and an advisor on palaeontological conservation and management issues for the Palaeontological Society of South Africa (PSSA), HWC and SAHRA. He is currently compiling technical reports on the provincial palaeontological heritage of Western, Northern and Eastern Cape for SAHRA and HWC. Dr Almond is an accredited member of PSSA and APHP (Association of Professional Heritage Practitioners – Western Cape).

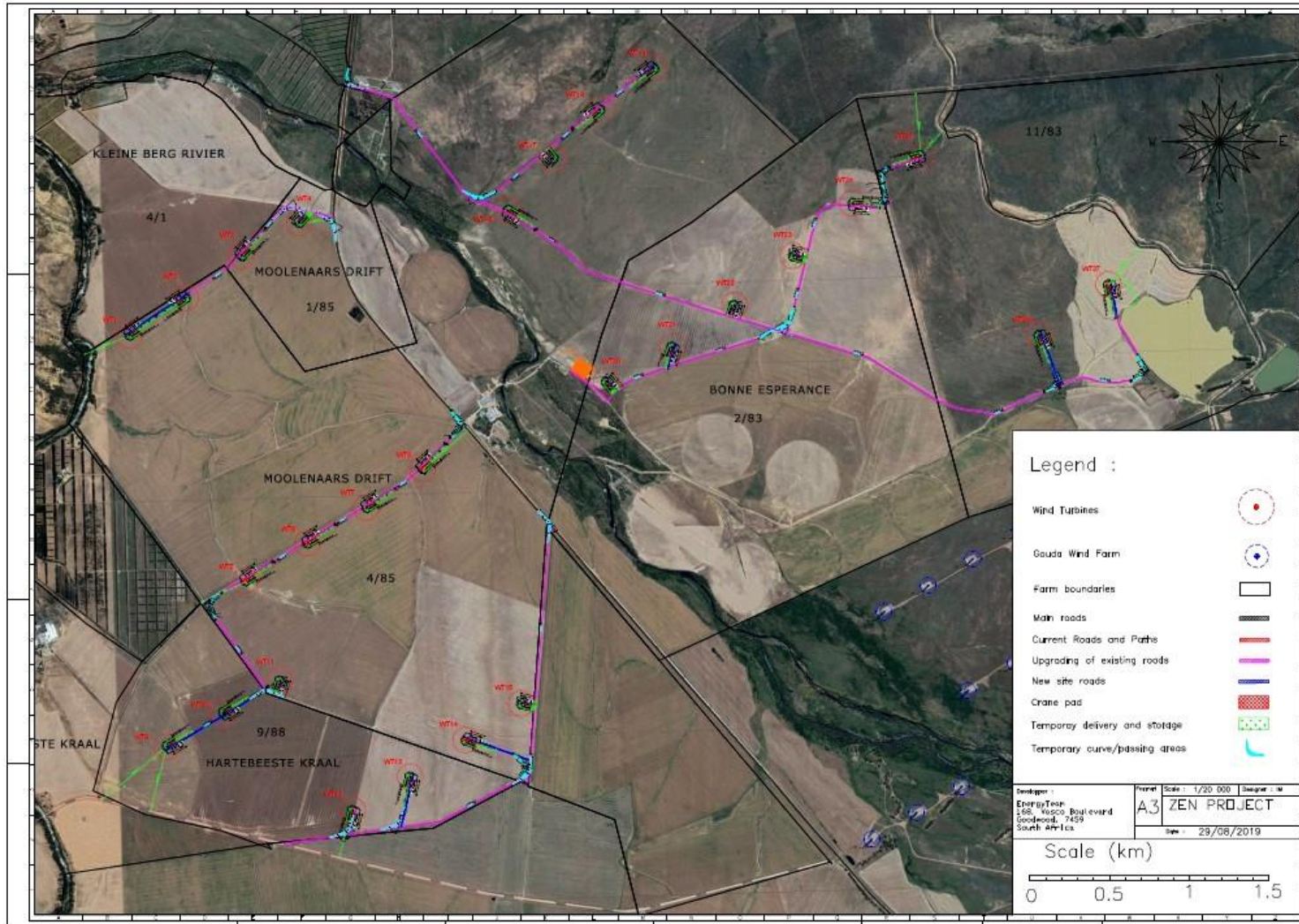


Figure 1: Revised layout (Part 2 Amendment) for the authorized Zen Wind Farm near Saron, Western Cape

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Appendix 2: CHANCE FOSSIL FINDS PROCEDURE: Zen Wind Farm near Saron, Western Cape	
Province & region:	Western Cape, Drakenstein Municipality
Responsible Heritage Resources Authority	HERITAGE WESTERN CAPE (Contact details: Protea Assurance Building, Green Market Square, Cape Town 8000. Private Bag X9067, Cape Town 8001. Tel: 086-142 142. Fax: 021-483 9842. Email: hwc@pgwc.gov.za)
Rock unit(s)	Malmesburg Group <i>sensu lato</i> , Late Caenozoic alluvium and soils
Potential fossils	Possible teeth, bones and horncores of mammals, freshwater molluscs, plant remains within older alluvial deposits.
ECO protocol	1. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (<i>N.B.</i> safety first!), safeguard site with security tape / fence / sand bags if necessary.
	2. Record key data while fossil remains are still <i>in situ</i> : <ul style="list-style-type: none"> • Accurate geographic location – describe and mark on site map / 1: 50 000 map / satellite image / aerial photo • Context – describe position of fossils within stratigraphy (rock layering), depth below surface • Photograph fossil(s) <i>in situ</i> with scale, from different angles, including images showing context (e.g. rock layering)
	3. If feasible to leave fossils <i>in situ</i> : <ul style="list-style-type: none"> • Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation • Ensure fossil site remains safeguarded until clearance is given by the Heritage Resources Authority for work to resume
	3. If <i>not</i> feasible to leave fossils <i>in situ</i> (emergency procedure only): <ul style="list-style-type: none"> • <i>Carefully</i> remove fossils, as far as possible still enclosed within the original sedimentary matrix (e.g. entire block of fossiliferous rock) • Photograph fossils against a plain, level background, with scale • Carefully wrap fossils in several layers of newspaper / tissue paper / plastic bags • Safeguard fossils together with locality and collection data (including collector and date) in a box in a safe place for examination by a palaeontologist • Alert Heritage Resources Authority and project palaeontologist (if any) who will advise on any necessary mitigation
	4. If required by Heritage Resources Authority, ensure that a suitably-qualified specialist palaeontologist is appointed as soon as possible by the developer.
	5. Implement any further mitigation measures proposed by the palaeontologist and Heritage Resources Authority
Specialist palaeontologist	Record, describe and judiciously sample fossil remains together with relevant contextual data (stratigraphy / sedimentology / taphonomy). Ensure that fossils are curated in an approved repository (e.g. museum / university / Council for Geoscience collection) together with full collection data. Submit Palaeontological Mitigation report to Heritage Resources Authority. Adhere to best international practice for palaeontological fieldwork and Heritage Resources Authority minimum standards.

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