

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

Proposed iNca Energy wind farm project near Vredendal, Western Cape Province

John E. Almond PhD (Cantab.)
Natura Viva cc, PO Box 12410 Mill Street,
Cape Town 8010, RSA
naturaviva@universe.co.za

May 2011

The company iNca Energy is proposing to develop a 60MW wind farm on the south-western outskirts of Vredendal, Western Cape Province. The land is currently zoned as agricultural and lies on the south side of the Olifants River (Fig. 1).

The geology of the study site is shown in 1: 250 000 geological map 3118 Calvinia (Council for Geoscience, Pretoria) (Fig. 2). Apart from scattered small exposures of fluvial quartzites of the Peninsula Formation (Table Mountain Group) of Ordovician age, the development area is blanketed in a range of Late Caenozoic superficial deposits, including aeolian sands and various soils.

The Peninsula Formation is largely unfossiliferous, although a limited range of trace fossils have been recorded from heterolithic (interbedded sandstone and mudrock) intervals within the succession (De Beer *et al.* 2002, Almond 2008b). These heterolithic beds are unlikely to be represented at outcrop within the study site since they are generally recessive weathering.

The **Late Caenozoic “drift” deposits** in the study area, described by De Beer *et al.* (2002), are likewise of low palaeontological sensitivity. The only fossils mentioned by these authors are calcretised subfossil termitaria (termite mounds or *heuweltjies*) that may be several thousand years old and reflect past, more pluvial climatic episodes. Recent carbon dating gives dates in the range of 30-40 000 years BP for fossil termitaria in the West Coast region, *i.e.* preceding the last glacial maximum (Midgley *et al.* 2002, Potts *et al.* 2009 and refs. therein). The sparse fossil record of unconsolidated Quaternary wind-blown sands in southern Africa also includes calcretized rhizoliths (root casts), invertebrate burrows, ostrich egg shells (*Struthio*) and shells of land snails (*e.g.* *Trigonephrus*) (Partridge *et al.* 2006, Almond 2008a, Almond & Pether 2008). Other fossil groups such as freshwater bivalves and gastropods (*e.g.* *Corbula*, *Unio*) and snails, ostracods (seed shrimps), charophytes (stonewort algae), diatoms (microscopic algae within siliceous shells) and stromatolites (laminated microbial limestones) are associated with local watercourses and pans. Microfossils such as diatoms may be blown by wind into nearby dune sands. Underlying calcretes might also contain trace fossils such as rhizoliths, termite and other insect burrows, or even mammalian trackways.

Alluvial deposits of the Olifants River are not mapped within the study area but they may be buried beneath a mantle of younger superficial deposits here. Mammalian bones, teeth and horn cores (also tortoise remains, and fish, amphibian or even crocodiles in wetter depositional settings) may be occasionally expected, notably in association with older alluvial gravels (*cf* Almond 2008a). The Tertiary Olifants River Gravels at Vredendal have yielded a range of silicified woods of tropical angiosperms that are referred to the Miocene Epoch (Bamford 1999). The younger (Quaternary) fluvial sands and gravels that might be found within the proposed development area are unlikely to contain any substantial fossil or subfossil remains.

The overall palaeontological sensitivity of the Table Mountain Group and Late Caenozoic “drift” sediments mapped within the study region is low to very low (Almond & Pether 2008). **For this reason, no further palaeontological studies are recommended for this development.**

Should substantial fossil remains (e.g. fossil vertebrate remains or petrified woods in subsurface alluvial gravels, calcretized termitaria) be exposed during construction, however, the ECO should safeguard these, preferably *in situ*, and alert SAHRA as soon as possible so that appropriate action (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.

John E. Almond

Dr John E. Almond
Palaeontologist
Natura Viva cc, CAPE TOWN

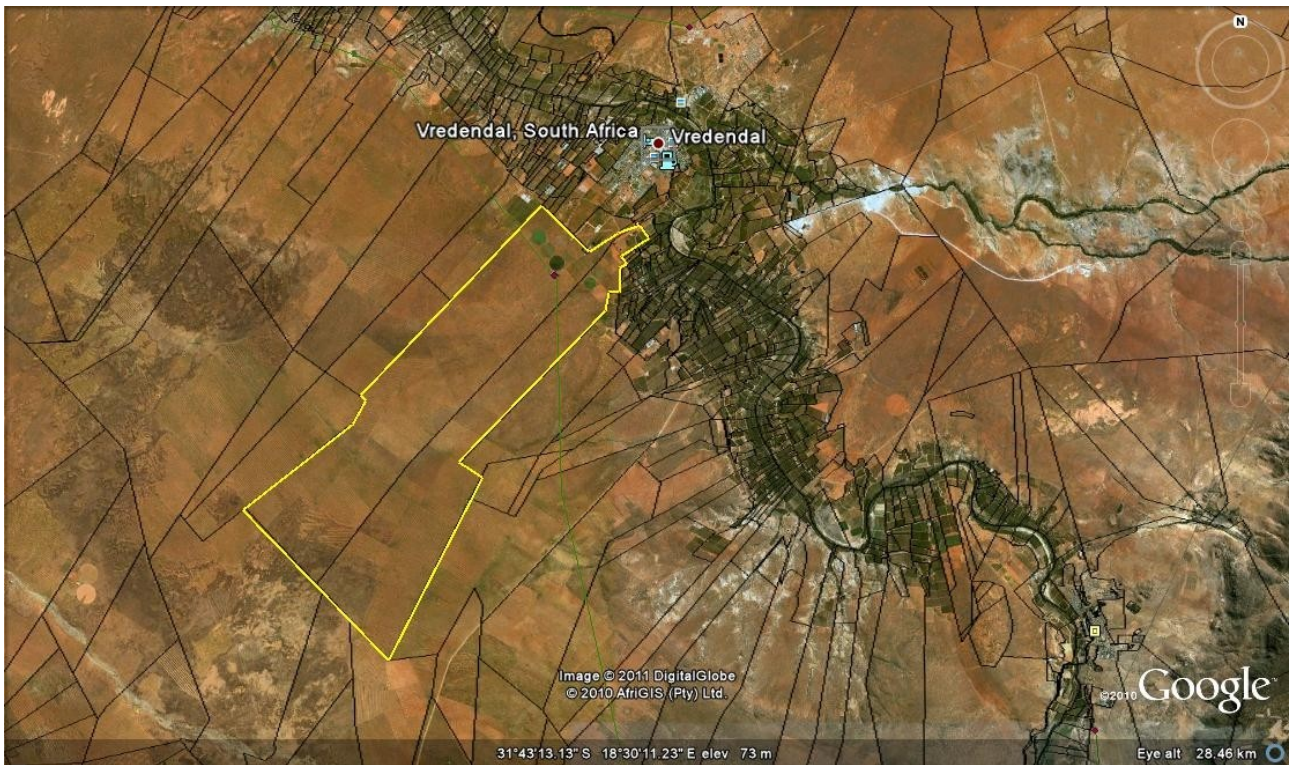


Fig. 1. Google Earth satellite image of the Vredendal area showing location of the proposed wind farm (yellow polygon).

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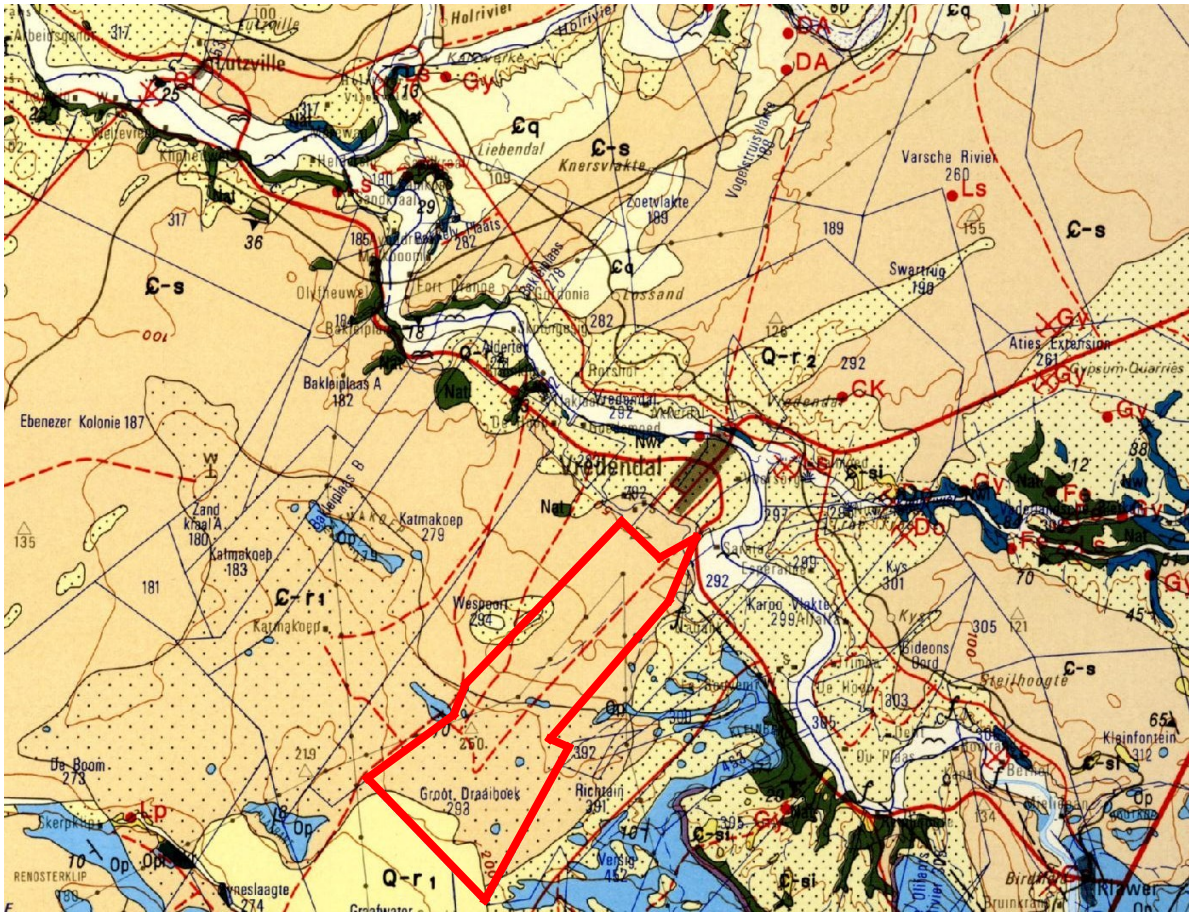


Fig. 2. Extract from 1: 250 000 geology sheet 3118 Calvinia showing the geology of the study area on the south side of the Olifants River to the southwest of Vredendal, Western Cape Province (red polygon).

- Op = Peninsula Formation (Table Mountain Group)
- Q-r1 = white to pale red sandy soil
- c-s = red aeolian sand
- c-r1 = loam and sandy soil

QUALIFICATIONS & EXPERIENCE OF THE AUTHOR

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 under the aegis of his Cape Town-based company *Natura Viva* cc. He is 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 APHAP (Association of Professional Heritage Assessment Practitioners – Western Cape).

Declaration of Independence

I, John E. Almond, declare that I am an independent consultant and have no business, financial, personal or other interest in the proposed development project, application or appeal in respect of which I was appointed other than fair remuneration for work performed in connection with the activity, application or appeal. There are no circumstances that compromise the objectivity of my performing such work.



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