

RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:

PROPOSED DEVELOPMENT OF THE GIHON SOLAR ENERGY FACILITY NEAR BELA-BELA, WATERBERG DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

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1. OUTLINE OF PROPOSED DEVELOPMENT

The company Networkx Renewables (Pty) Ltd is proposing to develop a commercial photovoltaic (PV) solar energy facility, known as the Gihon Solar Energy Facility with a generating capacity of up to 150 MW, as well as associated infrastructure, on portions 1, 2, 5 and 7 of the farm Turfbult 494 K, situated approximately 4 km south of Bela-Bela, Waterberg District Municipality, Limpopo Province (Fig. 1). The solar facility will be developed in two phases and has an anticipated footprint of 310 hectares located within the study area of 392 hectares.

The main infrastructural components of the proposed solar energy facility include:

- Arrays of PV panels and respective inverter stations;
- Appropriate mounting structures for panels;
- Cabling between the projects components, to be laid underground where practical;
- On-site transformers to step up the power and a substation to facilitate the connection between the solar energy facility and the Eskom electricity grid.
- An overhead power line to loop-in and loop out of the existing Pelly-Warmbad 132kV power line located at the northern boundary of the site.
- Building for maintenance, control and storage.
- Internal access roads and fencing.

This palaeontological heritage assessment comment was commissioned as a component of a comprehensive EIA for the proposed solar energy facility by Heritage Contracts and Archaeological Consulting CC (HCAC) (Contact details: Mnr Jaco van der Walt. Postnet Suite No. 426, Private Bag X4, Wierda Park, 0149. E-mail: contracts.heritage@gmail.com. Fax: 086 691 6461).

2. GEOLOGICAL BACKGROUND

The Gihon solar energy facility study area c. 4 km south of Bela-Bela lies about 6 km west of the N1 trunk road and straddles the R101 tar road to Hammanskraal. It comprises very flat-lying terrain at 1100-1120 m amsl, currently largely agricultural land, and satellite images show that bedrock exposure is negligible.

The geology of the study area is shown on 1: 250 000 geology map (metallogenic series) 2428 Nylstroom / Modimolle (Ehlers & Du Toit 2002)(Fig. 2). The area lies on the northwestern edge of the Springbok Flats Basin and is underlain by basaltic volcanics of the **Lebombo Group** (Karoo Igneous Province) of Early Jurassic age (Duncan & Marsh 2009). These are mapped as belonging to the **Letaba Formation** (picritic lavas) overlying Triassic continental sediments of the Stormberg Group in the Springbok Flats Basin (Ehlers & Du Toit 2002, their fig. 2, Johnson *et al.* 2009). The fossiliferous Stormberg Group rocks will not be impacted by the proposed

development. The Karoo volcanics are mantled by **Caenozoic superficial deposits** such as calcrete hardpans, downwasted gravels, alluvium and soils.

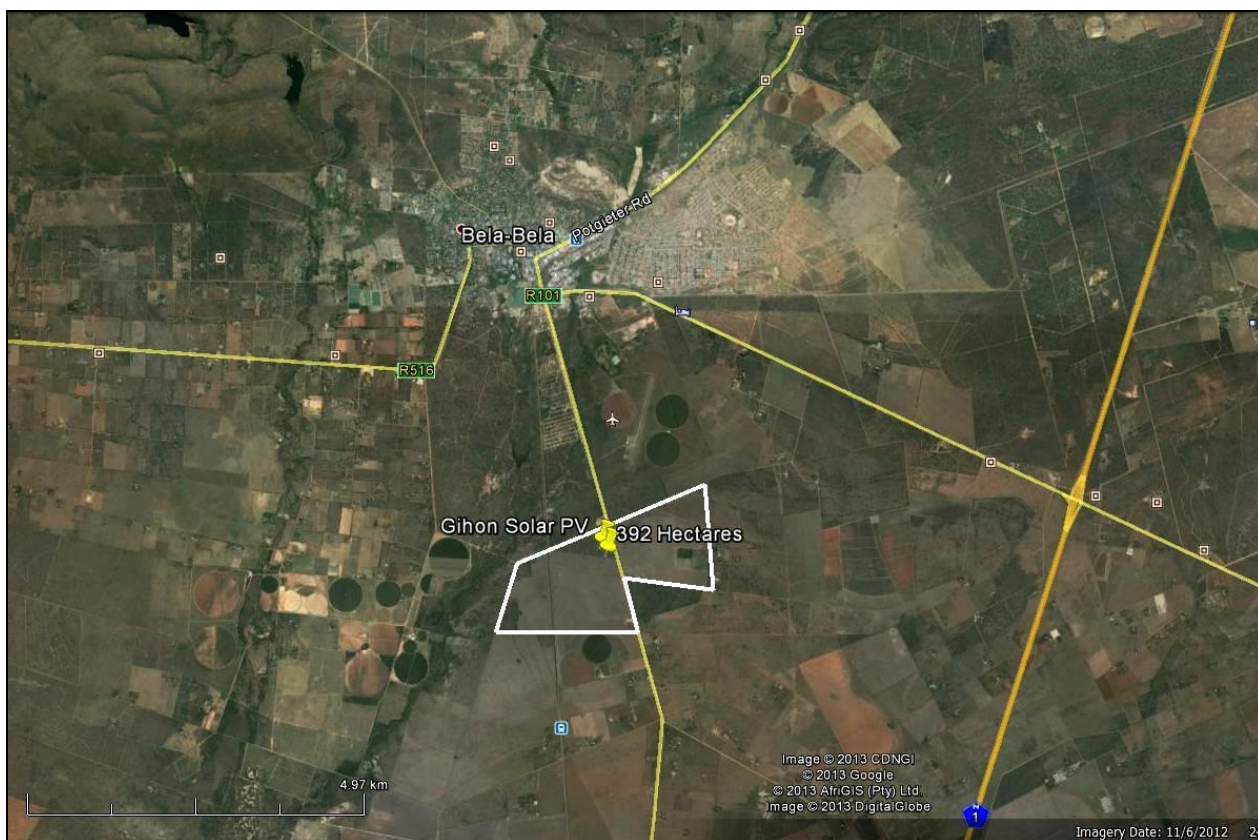


Figure 1: Google earth© satellite image showing the boundaries of the study area for the proposed Gihon solar energy facility situated c. 4 km south of Bela-Bela, Limpopo (white polygon).

3. PALAEOLOGICAL HERITAGE

Igneous rocks such as basaltic lavas are generally unfossiliferous and to the author's knowledge, no fossils have been recorded from the Letaba Formation succession of the Lebombo Group in the Springbok Flats Basin. Fossils (e.g. plants, traces, vertebrate bones) might occur within thin sedimentary intervals between the successive lava flows but are likely to be very sparse indeed. The overlying Caenozoic superficial sediments are likewise of low to very low palaeontological sensitivity.

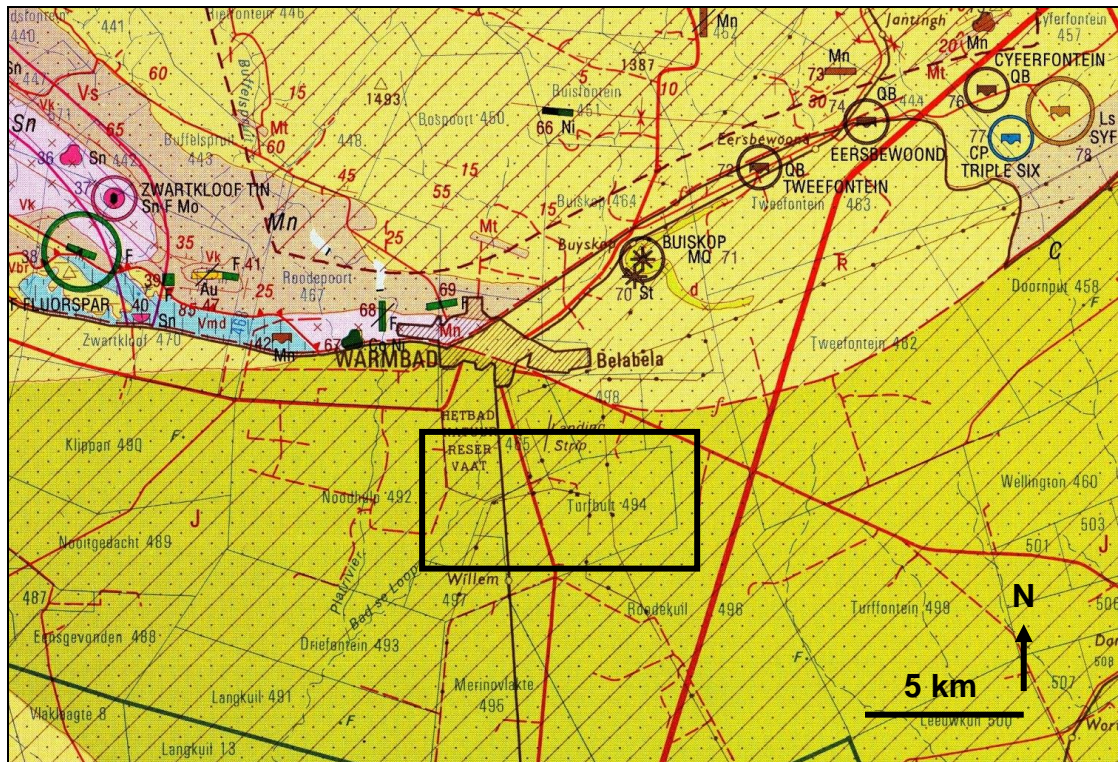


Fig. 2. Extract from 1: 250 000 geological map (metallogenic series) 2428 Nylstroom / Modimolle (Council for Geoscience, Pretoria) showing the approximate location of the proposed Gihon solar energy facility study area (black polygon) to the south of Bela-Bela (previously Warmbad). The area is entirely underlain by Jurassic lavas of the Letaba Formation, Lebombo Group (pea green, J).

4. CONCLUSIONS & RECOMMENDATIONS

The proposed Gihon solar energy facility near Bela-Bela, Limpopo, is underlain by unfossiliferous volcanic bedrocks (Letaba Formation basalts, Lebombo Group) as well as superficial sediments (gravels, soils etc) of low palaeontological sensitivity. The impact significance of the development on local fossil heritage resources is considered to be LOW.

It is therefore recommended that exemption from further specialist palaeontological studies is granted for the proposed Gihon solar energy facility near Bela-Bela.

Any substantial fossil remains (e.g. fossil shells, petrified wood or plant remains, vertebrate bones, teeth) encountered during excavation should be reported to SAHRA (Contact details: Ms. Colette Scheermeyer, South African Heritage Resources Agency, 111 Harrington Street. P.O. Box 4637, Cape Town 8000. Tel: 021 462 4502. Email: cscheermeyer@sahra.org.za. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za) for possible mitigation by a professional palaeontologist.

5. REFERENCES

- DUNCAN, A.R. & MARSH, J.S. 2006. The Karoo Igneous Province. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 501-520. Geological Society of South Africa, Marshalltown.
- EHLERS, D.L. & DU TOIT, M.C. 2002. Explanation of the Nylstroom metallogenic map sheet 2428. Scale 1: 250 000, 118 pp. Council for Geoscience, South Africa.
- JOHNSON, M.R., VAN VUUREN, C.J., VISSER, J.N.J., COLE, D.I., De V. WICKENS, H., CHRISTIE, A.D.M., ROBERTS, D.L. & BRANDL, G. 2006. Sedimentary rocks of the Karoo

Supergroup. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.) The geology of South Africa, pp. 461-499. Geological Society of South Africa, Marshalltown.

8. 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 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.



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