Ceres Golf Estate, Hotel and Housing Developments

PALAEONTOLOGICAL IMPACT ASSESSMENT

Desktop study prepared for
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1. Outline of geological units and relevant palaeontology

The proposed developments are situated on the southwestern edge of Ceres at the foot of the Skurweberge (northeastern end of Michell's Pass). All three developments are situated above geologically young (Quaternary) surface deposits overlying much older sandstone bedrock of the Rietvlei Formation, the uppermost subunit of the Table Mountain Group (Nardouw Subgroup) (1: 250 000 geological sheet Worcester).

The **Quaternary colluvium** (slope deposits) and **alluvium** (river deposits) along the foot of the Skurweberge and Hexrivierberge are unlikely to contain significant palaeontological material, since their coarse-grained, porous nature generally does not favour fossil preservation.

The **Rietvlei Formation**, of Early Devonian age (*c.* 410 million years), consists of thin- to medium-bedded pale siliceous and occasionally feldsapthic sandstones with thin pebbly beds and minor mudrocks (Theron & Basson 1989, Malan & Theron 1989, Gresse & Theron 1992). In the eastern outcrop area of this formation in the Little Karoo, these rocks were laid down in a cool, shallow marine setting at high palaeolatitudes and contain a restricted faunule of **shelly invertebrates** dominated by the articulate brachiopod *Pleurothyrella*, with rare homalonotid trilobites, inarticulate brachiopods, bryozoans and gastropods. Highly bioturbated (burrowed) horizons are also common here. Identifiable **trace fossils** include mud-lined horizontal burrows (*Palaeophycus*), vertical spreiten burrows (*Rosselia*) and rare giant trilobite burrows (*Rusophycus*; Almond pers. obs). This shallow marine fauna permits accurate correlation with equivalent-aged beds in South America. However, such fossil assemblages have not yet been recorded within the Rietvlei Formation west of the Warmwaterberg (shelly fossils) or Montagu (trace fossils) (Theron & Basson

1989, Almond pers. obs.). The western successions, such as those exposed in the Ceres area, may therefore have been laid down in a more proximal, inshore marine or even coastal alluvial environments, and are probably unfossiliferous as far as macroscopic fossils are concerned. There is potential for microfossils in finer-grained, mudrock interbeds (*e.g.* those recorded at Matroosberg; Gresse & Theron 1992) but these are rarely exposed and are usually highly weathered in near-surface occurrences.

2. Conclusions and recommendations

The proposed golf estate, hostel and housing developments at Ceres are unlikely to significantly compromise palaeontological heritage. Should fossil material be exposed during development, however, this may well be of considerable scientific interest and Heritage Western Cape should be informed by the responsible ECO at the earliest opportunity to allow appropriate mitigation and recording by a professional palaeontologist to take place.

3. References

Gresse, P.G. & Theron, J.N. 1992. *The geology of the Worcester area.* Explanation of 1: 250 000 geological Sheet 3319. 79 pp *plus* appendix. Council for Geoscience, Pretoria.

Malan, J.A. & Theron, J.N. 1989. Nardouw Subgroup. Catalogue of S. African lithostratigraphic units, pp. 50-51. Council for Geoscience, Pretoria.

Theron, J.N. & Basson, W.A. 1989. *Lithostratigraphy of the Rietvlei Formation (Table Mountain Group).* Lithostratigraphic Series No. 7, Council for Geoscience, Pretoria, 5pp *plus* chart.