

Nonhlanhla Vilakazi, PhD

Department of Anthropology and Archaeology

University of South Africa

Pretoria

HERITAGE IMPACT ASSESSMENT REQUESTED IN TERMS OF SECTION 38 OF THE NATIONAL HERITAGE RESOURCES ACT NO 25/1999 FOR THE PROPOSED MINE PROSPECTING ON REMAINING PORTION OF THE FARM JACOBSONTEIN (PLAAS 503 / WERDA) NEAR POSTMASBURG IN THE NORTHERN CAPE PROVINCE

INTRODUCTION

Z.T. Mgcawu District Municipality, formerly known as Siyanda District Municipality, forms the mid-northern section of the province on the frontier with Botswana (localgovernment.co.za). The district comprises six local municipalities namely: Mier, Kai! Garib, //Khara Hais, Tsantsabane, !Kheis and Kgatelopele (localgovernment.co.za). Upington is the district municipal capital, where the municipal government is located.

GEOLOGICAL CONTEXT

The municipality falls within the Campbell Rand Subgroup (previously included within the Ghaaplatto Formation) of the Ghaap Group (Almond, 2012). The Campbell Rand succession has been subdivided into a series of formations, some of which were previously included within the older Schmidtsdrift Formation or Subgroup (Eriksson, et. al., 2006).

This Subgroup (Campbell Rand) is a very thick (1.6-2.5 km) carbonate platform succession of dolomites, dolomitic limestones and cherts with minor tuffs that were deposited on the shallow submerged shelf of the Kaapvaal Craton, roughly 2.6-2.5 Ga (billion years ago) (McCarthy & Rubidge, 2005). A range of shallow water facies, often forming depositional cycles reflecting sea level changes, including stromatolitic limestones and dolostones, oolites, oncolites, laminated calcilutites, cherts and

marls, with subordinated siliclastics (shales, siltstones) and minor tuffs, can be seen (Almond, 2014). Exposure levels of these rocks are often very low due to their solubility and low resistance to weathering (Almond, 2012). The outcrop area of chert-rich subunits is often largely covered in down wasted, siliceous rock rubble (Almond, 2012).

Banded ironstone sand deposits are also present. These are distinctive units of sedimentary rock that are almost always Precambrian Age. They are important in that they are a commercial source of iron ore. This banded ironstone contains from 25 to 45% Iron (Taylor, et. al., 1988). The ore is very fine grained and made up predominantly of hematite, which can be successfully upgraded to suit blastfurnace operations (Taylor, et. al., 1988).



Figure 1: Photo showing some banded ironstone in the area.



Figure 2: Photo showing sedimentary layers on the slope of the ridge on Werda.

PALAEONTOLOGICAL CONTEXT

The shallow shelf and intertidal sediments of the carbonate-dominated lower part of the Ghaap Group are well known for their rich fossil biota of stromatolites or microbially-generated, finely-laminated sheets, mounds and branching structures (Almond, 2012). Some stromatolite occurrences on the Ghaap plateau of the Northern Cape are well preserved (Eriksson, *et. al.*, 2006).

The Tsineng Formation at the top of the Campbell Rand carbonate succession has yielded both stromatolites which were previously assigned to the Tsineng Member of the Gamohaam Formation, as well as filamentous microfossils named *Siphonophycus* (Altermann & Schopf, 1995).



Figure 3: Photo showing a possible fossil imprint.

CONCLUSION AND RECOMMENDATIONS

The Campbell Rand Subgroup has yielded well preserved stromatolites as well as filamentous microfossils. There is most likely to be good material around the proposed area. Once construction has begun, and if good exposures are found/uncovered, these should be safeguarded preferably *in situ* and reported as soon as possible to the relevant heritage management authority (South African Heritage Resources Agency). This will help in the preservation of our heritage/science.

REFERENCES

ALMOND, J.E. 2012. Palaeontological specialist assessment: desktop study. Proposed 16 MTPA expansion of Transnet existing Manganese ore export railway line and associated infrastructures' between Hotazel and the port of Ngqura, Northern and Eastern Cape

ALMOND, J.E. 2014. Palaeontological heritage basic assessment: desktop study. Proposed mineral prospecting on the farms Achambachs Puts 56, Plaas 53, Plaas 566 and Plaas 567 near Griekwastad, Siyancuma Local Municipality, Hay Magistrial District, Northern Cape

ALTERMANN, W. & SCHOPF, J.W. 1995. Microfossils from the Neoarchaeon Campbell Group, Griqualand West sequence of the Transvaal Supergroup, and their palaeoenvironmental and evolutionary implications. *Precambrian Research* **75**: 65-90

ERIKSSON, P.G., ALTERMANN, W. & HARTZER, F.J. 2006. The Transvaal Supergroup and its precursors. In: Johnson, M.R., Anhaeusser, C.R. & Thomas, R.J. (Eds.). *The geology of South Africa*, pp 237-260. Geological Society of South Africa, Marshalltown

McCARTHY, T. & RUBIDGE, B. 2005. *The story of Earth and life: a southern African perspective on a 4.6-billion-year journey*, 344 pp. Struik, Cape Town

TAYLOR, D.J.C., PAGE, D.C. & GELDENHUYS, P. 1988. Iron and steel in South Africa. *J. S. Afr. Inst. Min. Metall.* **88(3)**: 73-95

<http://localgovernment.co.za>