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Khomfini Vehicular Bridge

INTRODUCTION

UMzinyathi District Municipality is located in the north central areas of KwaZulu-Natal. The district consists of four local municipalities: Endumeni, Nquthu, Msinga, and Umvoti. The district lies between the main N3 Corridor between Durban and Gauteng and the Coastal Corridor, running along the east coast. The proposed Tugela (Khomfini) River Vehicular Bridge is within Msinga Local Municipality.

The proposed development will impact two sides of the river. The eastern side is currently used for low scale farming activities, while the western section of the river has an existing access road which has significantly cause erosion on section of the road. In general, the proposed bridge will traverse on an area which is extensively disturbed by activities related to agriculture and access road, such that if any archaeological sites existed in the past, it might have been completely disturbed or destroyed.

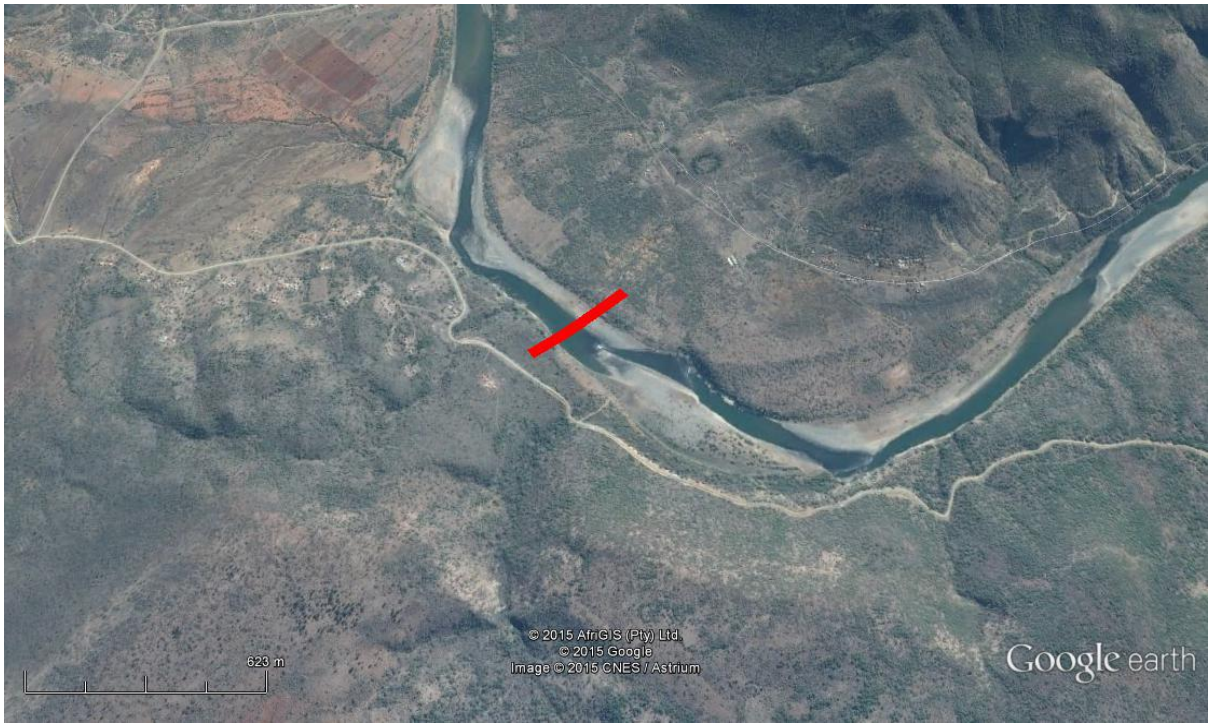

Figure 1: An overview of the area proposed for the bridge

Figure 2: Aerial overview of the proposed site of the bridge as indicated in blue

Geological Context

The municipality falls within the Karoo Supergroup. The study area is underlain by sedimentary rocks of the Permian aged Vryheid Formation of the Ecca Group (Cairncross, 1989). The strata consist primarily of sandstone, carbonaceious siltstone, shale, minor conglomerate and several coal seams (Cairncross, 2001).

The Vryheid Formation comprises a series of vertically stacked upward-coarsening and upward-fining facies assemblages that represent lobate deltaic and fluvial deposits, respectively (Cairncross, 1989). The deltaic systems originally deposited clastic sediment upon which swamps developed, and these sediments were later modified, either partially or entirely eroded away, by super imposed fluvial systems that cut down through the previously deposited deltaic sediment (Cairncross, 2001). The plant material that accumulated within these swamps formed the coal deposits mined today (Johnson, *et. al.*, 2006).

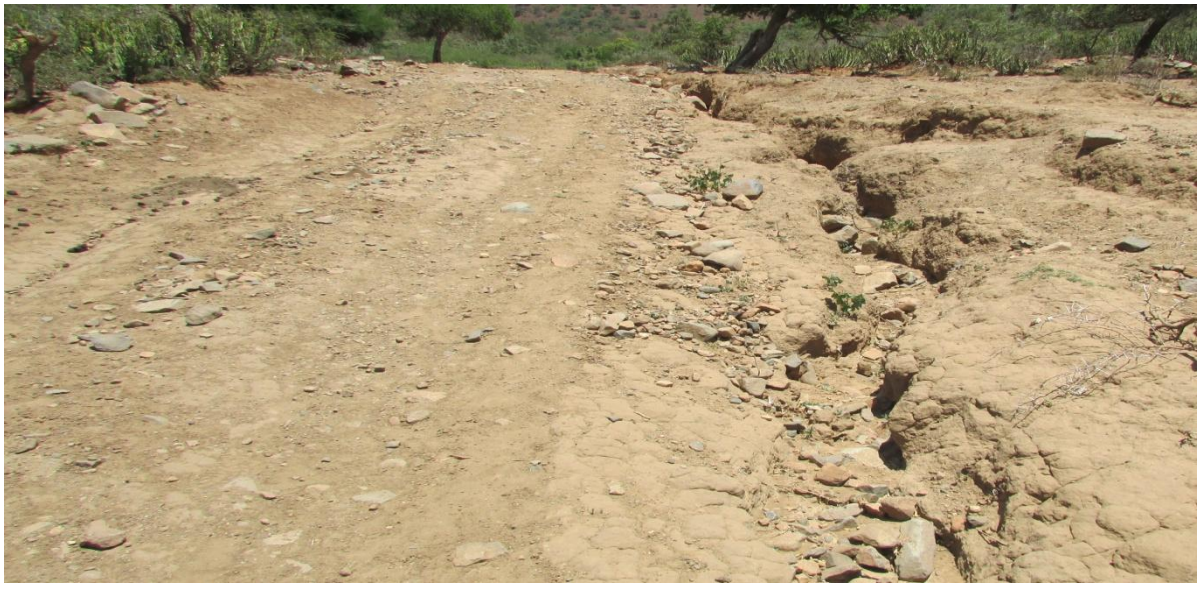

Figure 3: Overview of the western section which will be used in the construction of access roads. No fossils could be found on the surface.

Palaeontological Context

The Vryheid Formation is well-known for the occurrence of coal beds that resulted from the accumulation of plant material over long periods of time (Johnson, *et. al.*, 2006). Plant fossils from the Vryheid Formation are mainly *Glossopteris* plants. Little data has been published on these potentially fossiliferous deposits (Bamford, 2011). Good fossil material is likely to be found around the coal mines, and in other areas the exposures may be too poor. When these plant fossils occur, they are usually abundant but not all sites may be preserved and maintained in the interest of science, these sites should be well recorded, sampled, and fossils kept in an appropriate/suitable institution.

Although no vertebrate fossils have been recorded from the Vryheid Formation, invertebrate trace fossils have been described in some detail by Mason and Christie (1986). *Mesosaurus*, which is the earliest known aquatic reptile from the Karoo Basin, as well as fish (*Palaeoniscus capensis*), have been recorded in equivalent-aged strata in the Whitehill Formation in the southern part of the basin (MacRae, 1999). Indications are that the Whitehill Formation in the main basin might be correlated with the mid-Vryheid Formation. If this assumption proves correct, there is a possibility that *Mesosaurus* could be found in the Vryheid Formation.

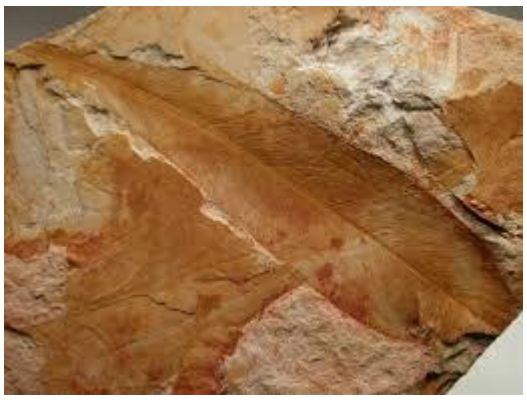

Figure 4: Photo showing the *Glossopteris* leaf that might be found in the area

Figure 5: Photo showing another type of the *Glossopteris* plant

Figure 6: Photo showing the *Palaeoniscus* species that might be found in the area

Conclusion and Recommendation

The above mentioned reasons, therefore, suggest that no further palaeontological studies are recommended for this development. Should substantial fossil remains be exposed during construction however; proper procedures should be followed. These include safeguarding the fossils preferably *in situ* and alerting SAHRA and/or AMAFA as soon as possible so that appropriate action (e.g. recording, sampling, and collection) can be taken by a qualified palaeontologist. This will help in the preservation of our heritage/science.

References

BAMFORD, M. 2011. Desktop study Palaeontology Ermelo to Empangeni-Eskom powerline. Internal report Bernhard Price Institute for Palaeontolgical Research, University of the Witwatersrand.

CAIRNCROSS, B. 2001. An overview of the Permian (Karoo) coal deposits of southern Africa. *African Earth Sciences* **33:** 529-562

CAIRNCROSS, B. 1989. Paleodepositional environments and tectono-sedimetary controls of the post glacial Permian coals, Karoo basin, South Africa. *International Journal of Coal Geology* **12:** 365-380

JOHNSON, M.R., van VUUREN, C.J., HEGENBERGER, W.F., KEY, R. & SHOKO, V. 1996. Stratigraphy of the Karoo Supergroup in southern Africa: an overview. *Journal of African Earth Sciences* **23:** 3-15

MACRAE, C. 1999. Life etched in stone. Geological Society of South Africa

MASON, T.R. & CHRISTIE, A.D.M. 1986. Palaeoenvironmental significance of ichnogenus *Diplocraterion torell* from the Permian Vryheid Formation of the Karoo Supergroup, South Africa. *Palaeogeography, Palaeoclimatology, Palaeoecology* **53(4):** 249-265

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