



BPI for Palaeontological Research

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Ms Fiona Bolton
Metago
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Email: fiona@metago.co.za

Dear Fiona,

Vanggatfontein, Delmas – Desktop Palaeontological Impact Assessment.

As requested, I have undertaken a desktop EIA to assess the effect that the expansion of a coal mining operation on Vanggatfontein 251 IR in the Delmas district will have on palaeontological heritage. My report is included herewith.

From a palaeontological perspective this development can proceed but I have suggested some mitigation procedures.

Please come back to me if there is anything you do not understand or are unhappy with in the reports.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'B. Rubidge'.

Professor Bruce Rubidge PhD, Pr Sci Nat

EXPANSION OF COAL MINING OPERATION ON THE FARM VANGGATFONTEIN 251 IR, DELMAS DISTRICT– DESK TOP PALAEOLOGICAL IMPACT ASSESSMENT

Introduction

A desk top EIA was undertaken on the farm Vanggatfontein 251 IR on the farm Delmas approximately 10km east of Delmas in the Mpumalanga Highveld to determine the effect that the proposed expansion of an open cast coal mining operation will have on palaeontological heritage in the area (Figure 1).

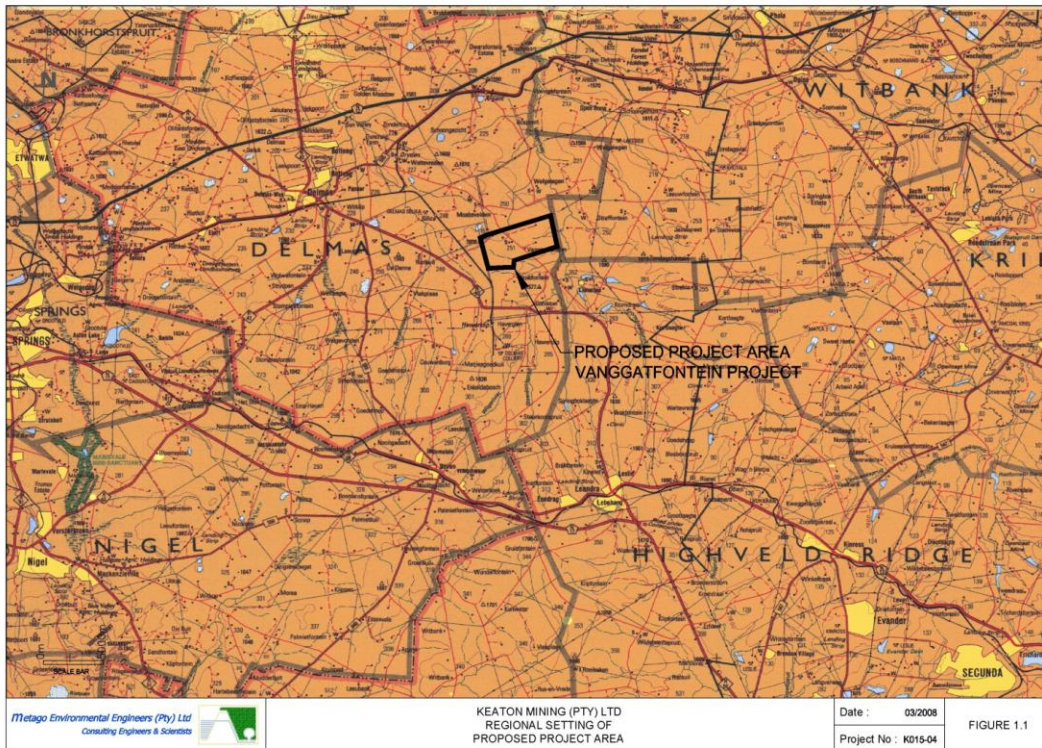


Figure 1: Map showing the locality of the farm Vanggatfontein 251 IR

Geology of the area

Most of the property is underlain by rocks of the Permian Vryheid Formation of the Ecca Group of the Karoo Supergroup. Following the Geological Map, in the northeastern portion of the property there are outcrops of the Carboniferous Dwyka Group and also the Precambrian Timeball Hill, Hekpoort and Loskop Formations of the Transvaal Supergroup. To the northwest and southwest of the property there are outcrops of the Malmani Subgroup of the Transvaal Supergroup and it is likely that this formation underlies the younger rocks of the Vryheid Formation on the farm Vanggatfontein 251 IR.

Palaeontological Heritage

The rocks of the Vryheid Formation of the Ecca Group are renowned for their wealth of plant fossils of the famous Gondwanan *Glossopteris* flora which has been described from Permian-aged rocks. This flora is the source of the coal which is mined from the Vryheid Formation in South Africa and on which this mine will be cited.

As the rocks of the Dwyka Group comprise coarse-grained diamictite and were deposited in a glacial environment in the Carboniferous Period it is unlikely that these rocks will contain fossils.

Apart from stromatolites, which are reasonably plentiful, the rocks of the Transvaal Supergroup are not known to contain fossils.

Recommendation

It is unlikely that the limited outcrops of the Timeball Hill, Hekpoort and Loskop Formations Transvaal Supergroup and the Dwyka Group in the northeastern part of the property will be affected by the proposed open cast mining development as this area is not being targeted for coal mining. Sinkholes will probably be present in the dolomitic rocks of the underlying dolomite-rich Malmani Subgroup, but as these were covered by rocks of the Permian Ecca Group there will not be Quaternary-aged breccias infill in the sinkholes.

Because important plant fossil localities are known from the Vryheid Formation the proposed opencast mining activities for coal will expose rocks of the Vryheid Formation. As construction activities will expose mudrocks of the Vryheid Formation, it will create a unique opportunity to explore the area for fossils.

It is thus recommended that, should fossil bearing mudrocks of the Vryheid Formation be exposed by excavation activities, a qualified palaeontologist be contacted to assess the exposure for fossils.

References

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A handwritten signature in blue ink, appearing to read 'B. Rubidge', is centered on the page. The signature is written in a cursive style with a large, stylized 'R'.

Professor Bruce Rubidge PhD, Pr Sci Nat