



## BPI for Palaeontological Research

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Private Bag 3, WITS 2050, South Africa • Telephone +27 11 717-6682 • Fax +27 11 717-6694

Email: [bruce.rubidge@wits.ac.za](mailto:bruce.rubidge@wits.ac.za)

30 April 2013

Mr Jonathan van de Wouw  
Prime Resources  
PO Box 2316  
Parklands  
2121

E-Mail: [jonathan@resources.co.za](mailto:jonathan@resources.co.za)

Dear Mr van de Wouw,

### **Palaeontological Desktop Report – KwaNgwane Antracite Mine**

As requested, herewith a Desktop Palaeontological Impact Assessment with regard to the proposed development of the Main Street 800 (Pty) Ltd - KwaNgwane Antracite Mine in the Nkomazi District of Mpumalanga Province.

Yours sincerely

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

**Bruce Rubidge** PhD, FGSSA, FRSSA, Pr Sci Nat

**PALAEONTOLOGICAL DESKTOP STUDY  
KWANGWANE ANTRACITE MINE IN THE NKOMAZI DISTRICT,  
MPUMALANGA PROVINCE.**

**AUTHOR:**

Professor Bruce Rubidge  
PO Box 85346  
Emmarentia

Tel: 072 575 7752

Email: [bruce.rubidge@wits.ac.za](mailto:bruce.rubidge@wits.ac.za)

**DEVELOPER:**

Name of Applicant: Main Street 800 (Pty) Ltd.  
Contact Person: Mr. Adam Wilkinson  
Address: 15th Floor  
World Trade Centre  
Johannesburg  
Cnr. West Road South & Lower Road  
Morningside  
Sandton

Postal Address: Postnet Suite 393  
Private Bag X9  
Benmore  
2010

Tel No.: 010 591 0630

Cell No: 084 562 3456

Fax No: 086 726 9196

Email: [awilkinson@zylimited.co.za](mailto:awilkinson@zylimited.co.za)

**DATE: 30 April 2013**

## EXECUTIVE SUMMARY

A desktop Palaeontological Impact Assessment was undertaken on the proposed KaNgwane anthracite mine, situated south of Komatipoort near the borders of Swaziland and Mocambique. The proposed development involves the development of a new opencast- and underground anthracite mine with typical supporting infrastructure.

Following the geological map (2530 Barbeton sheet 1:250 000 Geological Series, 1986 Geological Survey) the entire study area is underlain by sedimentary rocks of undifferentiated Permian-Triassic Karoo Supergroup.

As anthracite is present this part of the succession probably comprises rocks of the Ecca Group which is known to contain rich coal deposits which are derived from the famous Permian *Glossopteris* flora which has Gondwana-wide distribution. As the proposed development is to mine anthracite it has the potential to affect fossil plants.

The process of coal mining has the potential to destroy palaeontological heritage, and by its nature coal mining will destroy plant fossils. However, as these fossils are not currently exposed, the development of a coal mine will in fact enhance possibilities to discover plant and possibly other fossils. If fossils are exposed in the course expanding the mining development at KaNgwane a qualified palaeontologist must be contacted to assess the exposure for fossils so that the necessary rescue operations are implemented.

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# REPORT

## Background Information of the development

This desktop report is part of a Heritage Impact Assessment to determine the effect of the development of the KaNgwane anthracite mine on palaeontological heritage. The proposed development south of Komatipoort close to the borders of Swaziland and Mocambique comprises the development of a new anthracite mine (Figure 1). This development will occur on portions of the farms Walda 476, Joyde 477, Monson 478 and Waanhoop 485JU.

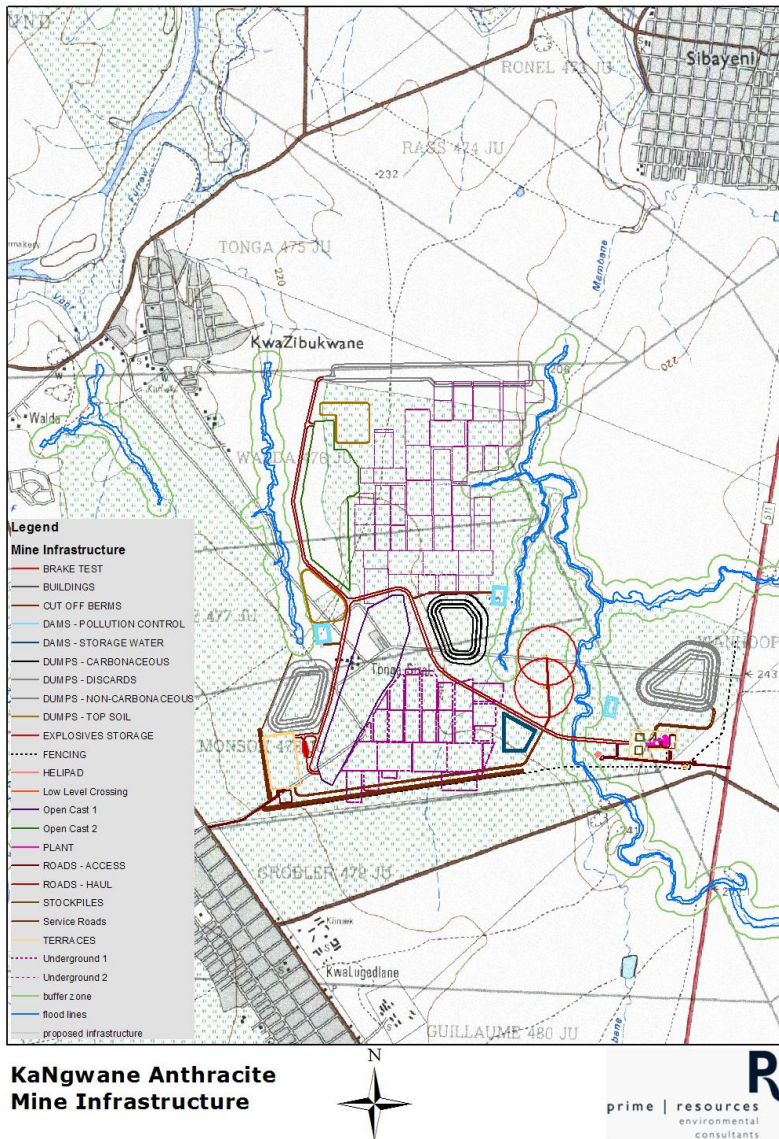


Figure 1: 1:50 000 topographic map showing the position of the proposed new mining development.

The study was commissioned by Prime Resources Environmental Consultants for Main Street 800 (Pty) Ltd. and, following a directive from SAHRA, I was asked to provide a desk top assessment of the affect that the proposed development will have on the palaeontological heritage.

### Details of the study area

The study area is situated on portions of the farms Walda 476, Joyde 477, Wonson 478 and Waanhoop 485JU and is covered by the 1:50 000 topographical map sheet 2531 DB - Tonga.

### Geological Setting

The entire area is underlain by rocks of the Karoo Supergroup comprising sedimentary rocks of undifferentiated Permian and Triassic deposits (Figure 2). The fact that the geological map does not differentiate between the Permian and Triassic deposits suggests that the outcrops are poor.

As anthracite is present it appears that the mining development will be in rocks of the Ecca Group, equivalent to the Vryheid Formation, which were deposited in a delta plain depositional environment.

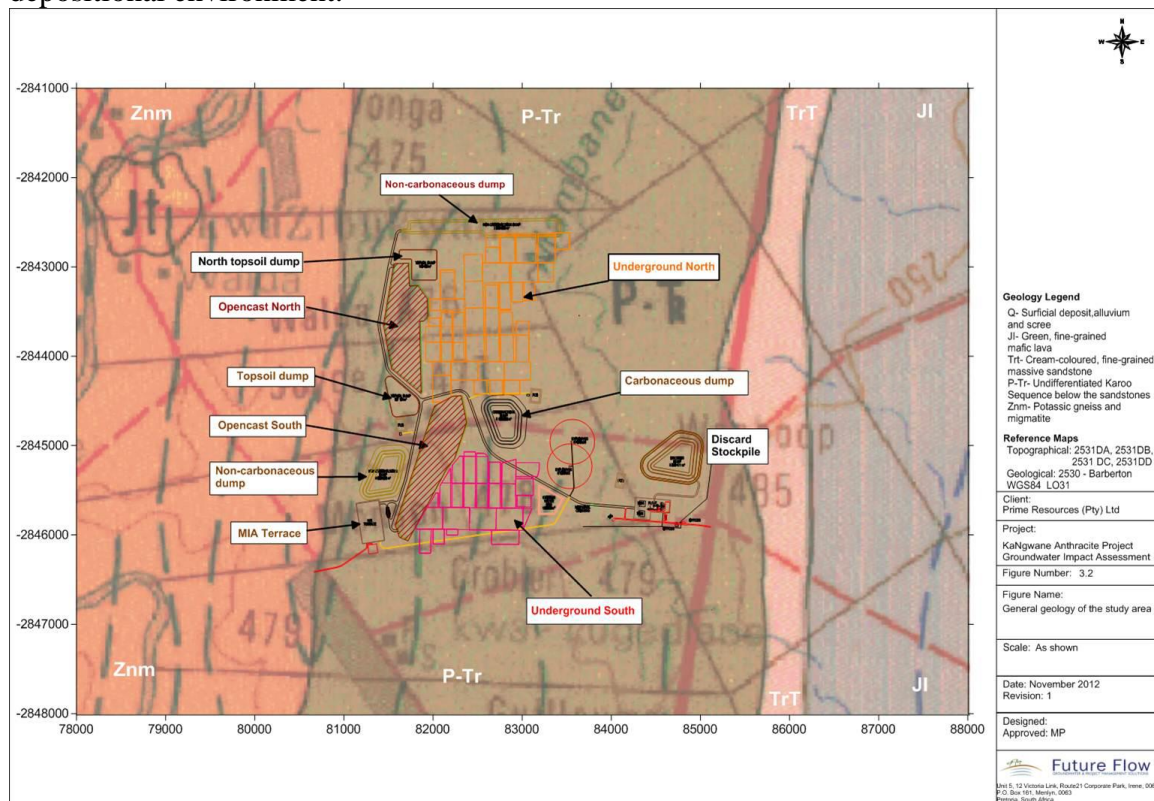


Figure 2: Map showing the geology of the study area in dicating that the entire study is situated on undifferentiated Permian – Triassic deposits.

## **Palaeontological Heritage**

The rocks 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 is the reason for the coal mining operations. Within the Vryheid Formation there are occurrences of well-preserved elements *Glossopteris* flora comprising wood and/or leaves. Large collections of fossil flora from this Formation are present in the collections of the Council for Geoscience in Pretoria and the BPI Palaeontology at the University of the Witwatersrand in Johannesburg.

## **Recommendation**

Because important plant fossil localities are known from the Ecca Group the proposed mining development activities may expose fossil bearing rocks of the Karoo Supergroup which are not currently visible as they are covered by soil and vegetation.

If construction activities expose extensive mudrocks of the Karoo Supergroup, it will create a unique opportunity to explore the area for fossils. It is thus recommended that, should fossils be exposed, a qualified palaeontologist be contacted to assess the exposure for fossils before further development takes place so that the necessary rescue operations are implemented. Depending on the nature of the fossils discovered this could entail excavation and removal to a registered palaeontological museum collection. A list of professional palaeontologists is available from South African Heritage Resources Agency (SAHRA).

## **Conclusions**

The proposed development of KaKgwane anthracite mine will cover Permian-aged sedimentary rocks of the Karoo Supergroup. There is a good possibility that the rocks could contain fossil plant material of *Glossopteris* flora. It is considered that the development of the anthracite mine as set out in Figure 1 should proceed, but that if fossils are uncovered in the course of construction activities, the developer immediately calls in a qualified palaeontologist to assess the situation and, if necessary, undertake excavation of the fossils.

## **Bibliography**

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