



TITLE: A DESKTOP PALAEOLOGICAL IMPACT ASSESSMENT FOR THE PROPOSED CONSTRUCTION OF KEATES DRIFT BULKWATER SUPPLY SCHEME FOR PHASE 3 AND 4 SPANNING OVER THE FOLLOWING FARMS ETEMBENI MISSION ERF 8312, AANGELEGEN ERF 1201, DUIKER HOEK ERF 3283, IMPANZA RIVER 1843, OLIVEFONTEIN 4427 AND TUGELA LOCATION 4674 SITUATED BOTH IN UMVOTI LOCAL MUNICIPALITY AND MSINGA LOCAL MUNICIPALITY, KWAZULU NATAL PROVINCE.

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DECLARATION OF INDEPENDENCE

This report has been compiled by Professor Marion Bamford for NGT Consulting. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision making process for the project.

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EXECUTIVE SUMMARY

The proposed route for the Keates Drift Bulkwater Supply Scheme Phase 3 and 4 is on sedimentary rocks of the Ecca and Beaufort Groups (in particular the Vryheid Formation) which potentially contains fossil plants of the Glossopteris flora. No fossils, however, have been reported from here, and the area is very disturbed. In the unlikely event that fossil plants are discovered during the excavations then it is strongly recommended that a professional palaeontologist be called to assess the scientific value of the fossils and if necessary remove and preserve them once an AMAFA permit has been obtained.

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1. BACKGROUND

Magalela & Associates (Pty) Ltd have requested an impact assessment for the proposed construction of Keates Drift Bulkwater Supply Scheme for Phase 3 and 4 spanning over the following farms Etembeni Mission Erf 8312, Aangelegen Erf 1201, Duiker Hoek Erf 3283, Impanza River 1843, Olivefontein 4427 and Tugela Location 4674 situated both in uMvoti Local Municipality and Msinga Local Municipality, KwaZulu Natal Province. As such a desktop palaeontological study is reported here for this proposed construction (centered around 28°53'21"S and 32°33'16"E – taken from Google Earth Map), shown in Figure 1.

In accordance with the national legislation (National Heritage Resources Act (No. 25 of 1999)) the sites to be developed must be assessed for the occurrence of any palaeontological material. If any fossils are likely to be present then their importance and rarity must be gauged and if they are important then plans must be put in place to remove the fossils (under a SAHRA permit and housed in an recognized institution), protect them and/or divert the proposed construction.

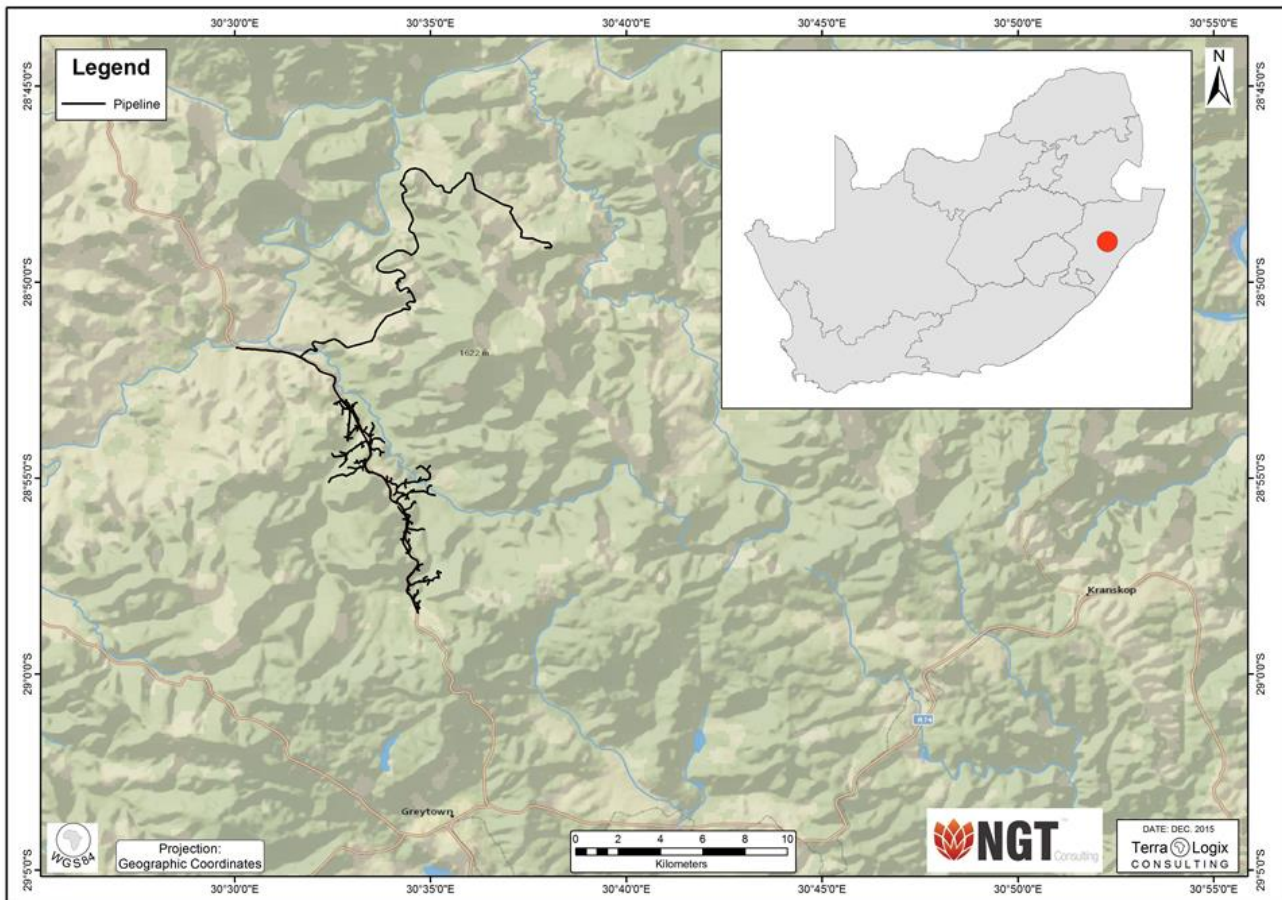


Figure 1 –Map showing the proposed project area

2. METHODS

The published geological and palaeontological literature, unpublished records and databases were consulted to determine if there are any records of fossils from the sites and the likelihood of any fossils occurring there.

3. A GEOLOGICAL AND PALAEOONTOLOGICAL CONTEXT OF THE STUDY AREA

3.1. Geological Context

The geology of the region comprises shales, sandstones, mudstones and some coal of the Ecca Group (Pietermaritzburg, Vryheid, lower Volksrust Formations) and Beaufort Group with components: Adelaide subgroup and Volksrust Formation. Numerous dolerite dykes of Jurassic age intrude through the Karoo sediments in this area. Any fossils in close proximity to the dykes are most commonly destroyed.

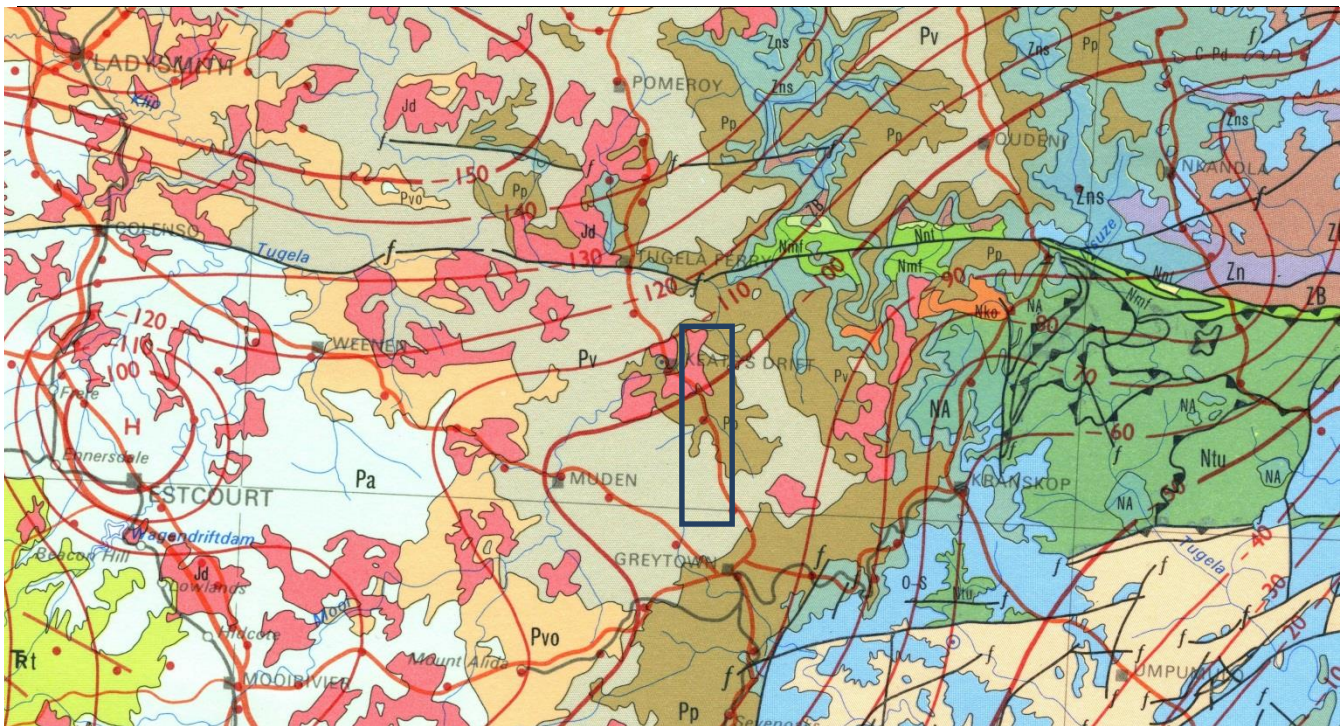


Figure 2- Geological map of the Keates' Drift area to be developed in the Msinga and Mvoti municipalities (north of Greytown) in the Permian shales. Abbreviations of the rock types are explained in Table 1. Map enlarged from the Geological Survey 1: 1 000 000 map 1984.

Table 1-Explanation of symbols for the geological map and approximate ages with the references: Johnson et al., (2006) Rubidge, (2005) SACS.

Symbol	Group/Formation	Lithology	Approximate Age
Jd	Jurassic dykes	dolerite	ca 183 Ma
Pa	Adelaide subgroup and Estcourt Fm	Mudstones, shales	Middle and Late Permian
Pvo	Volksrust Fm	shale	Middle and Late Permian
Pv	Vryheid Fm	Sandstones, shales, coal	Early Permian
Pp	Pietermaritzburg Fm	shale	Early Permian

3.2. Palaeontology

Fossil plants of the Glossopteris flora (lycopods, sphenophytes, ferns, seed ferns, gymnosperms) are known from the Ecca and Beaufort and vertebrates are known from the Beaufort Group but are not common in KwaZulu Natal (Anderson and Anderson, 1985). The coal fields are well to the north of the area that has been proposed for the development. To the north east in the Lebombo Basin from the Emakwazini Formation an Upper Permian Glossopteris flora has been described (Bordy and Prevec, 2008). Although the SAHRIS palaeontology map indicates that the area has a few sensitive patches (red), more green (desktop required) and grey (no fossils, no fossils, however, have been described from the area north of Greytown).

4. CONCLUSIONS

Based on the geological and palaeontological context of the region under consideration the following conclusion is made about the study area. Rocks in this area are the correct age to contain fossil plants but to date none has been exposed or recorded. The area is densely populated and highly disturbed with numerous small holdings, houses, roads, tracks and cultivated patches. It is unlikely that any fossils of any significance or sufficiently well preserved to be of scientific interest would be found along the proposed routes for the Keates Drift Bulkwater Supply Scheme for Phase 3 and 4.

5. RECOMMENDATIONS

If in the unlikely event that any fossils are discovered during the construction of the Bulkwater Supply Scheme and related access or infrastructure, then it is strongly recommended that a palaeontologist be called to assess their importance and rescue them if necessary after having acquired the relevant permit from Amafa. As far as the palaeontology is concerned the proposed development can go ahead along the proposed route.

6. REFERENCES

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