

**Palaeontological Impact Assessment for the proposed  
Kingbird powerline between the Fibre and  
Groblershoop substations, approximately 70km of  
132kV powerline, Northwest Province.**

**Desktop Study**

**For  
Landscape Dynamics  
Environmental Consultants**

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# **Palaeontological Impact Assessment for the proposed Eskom Kingbird powerline between the Fibre and Groblershoop substations, approximately 70km of 132kV powerline, Northwest Province**

## **Background**

As requested by Landscape Dynamics on behalf of their client, Eskom, a desktop palaeontological study is reported here for the proposed construction of about 70km of 132 kV powerline with pylons and a distribution substation. The powerline will go west around Groblershoop, southwards along the N10 highway to Draghoender and eastwards towards Fibre. The proposed routes of the powerline are on the west or on the east sides of the N10 highway (Fig 1). The properties that could be directly affected by this project are Farm 11/2, Farm 11/10, Farm 11/14, Farm 11/1, Farm 10/10, Farm 10/8, Farm 8/5, Farm 10/5, Farm 10/6, Farm 8/1, Farm 8/2, Farm 5(rem), Farm 5/2, Farm 3/1, Farm 2(rem), Erf 2642, Farm 8/7 and Erf 1885.

In accordance with the national legislation (National Heritage Act (Section 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.

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The published geological and palaeontological literature, unpublished records and databases were consulted to determine if there are any records of fossils from the sites and the likelihood of any fossils occurring there.

## **Geology and Palaeontology**

The proposed route for the powerline (both options) is on ancient rocks of the Randian, Vaalian and Mokolian Erathems. Around Groblershoop the rocks are covered with Quaternary alluvium, sand and calcrete which have no recorded fossils from this area. Southwards the route transects the Groblershoop Formation, Matsap Subgroup, Zeekoeibaart Formation, Draghoender Gneiss and the Skalkseput Granite. These are all ancient igneous rocks that have also been metamorphosed (Cornell et al., 2006; Moen, 2006) and range in age from 2900 to 2000 million years and are too old to preserve any forms of life other than microscopic bacteria or algae (Cowan, 1995). These types of rocks, however, do not even preserve microbes as the not sedimentary and have also been metamorphosed. The ages and types of the rocks are listed in Table 1.

## **Recommendation**

Since the rocks in this region are mostly much too old (Archaean to Proterozoic in age) to contain fossils or are sediments of the correct age but not known to have preserved any fossils (Neogene sands and alluvium) it is extremely unlikely that any fossils will be found along the two proposed routes for the powerlines. If, however, any fossils are discovered during the construction of the 132kV power line and 2 x 20MVA transformer foundations, then it is strongly recommended that a palaeontologist be called to assess their importance and rescue them if necessary.

As far as the palaeontology is concerned the proposed development can go ahead either any of the proposed routes. The substations are also no threat to the palaeontology.

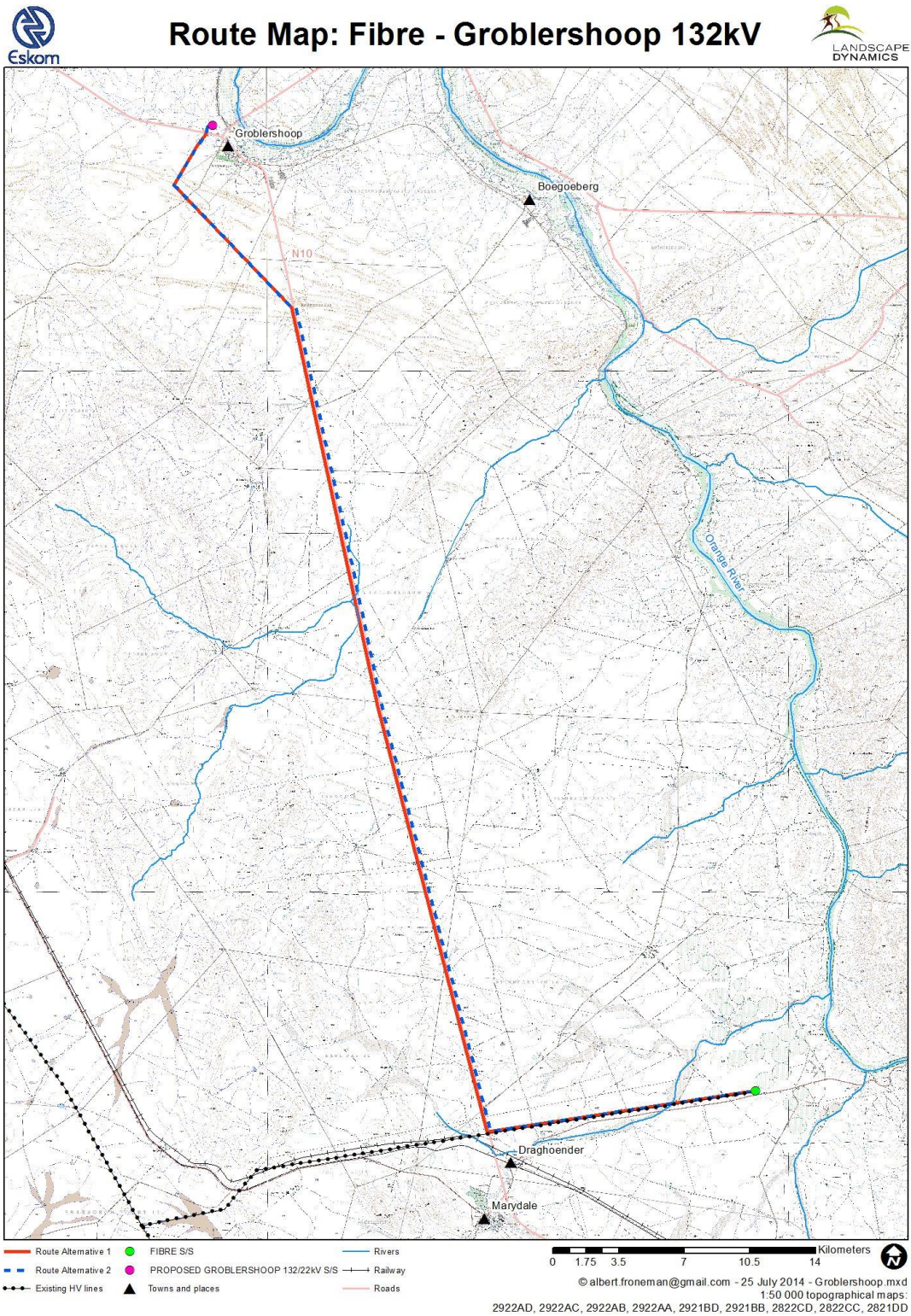


Figure 1: Map of proposed route of the approximate 70km 132 kV powerline from Groblershoep (north) to Fibre (southeast). This shows the powerline on the east of the highway; the other alternative is along the west side of the highway. Map supplied by Landscape Dynamics.

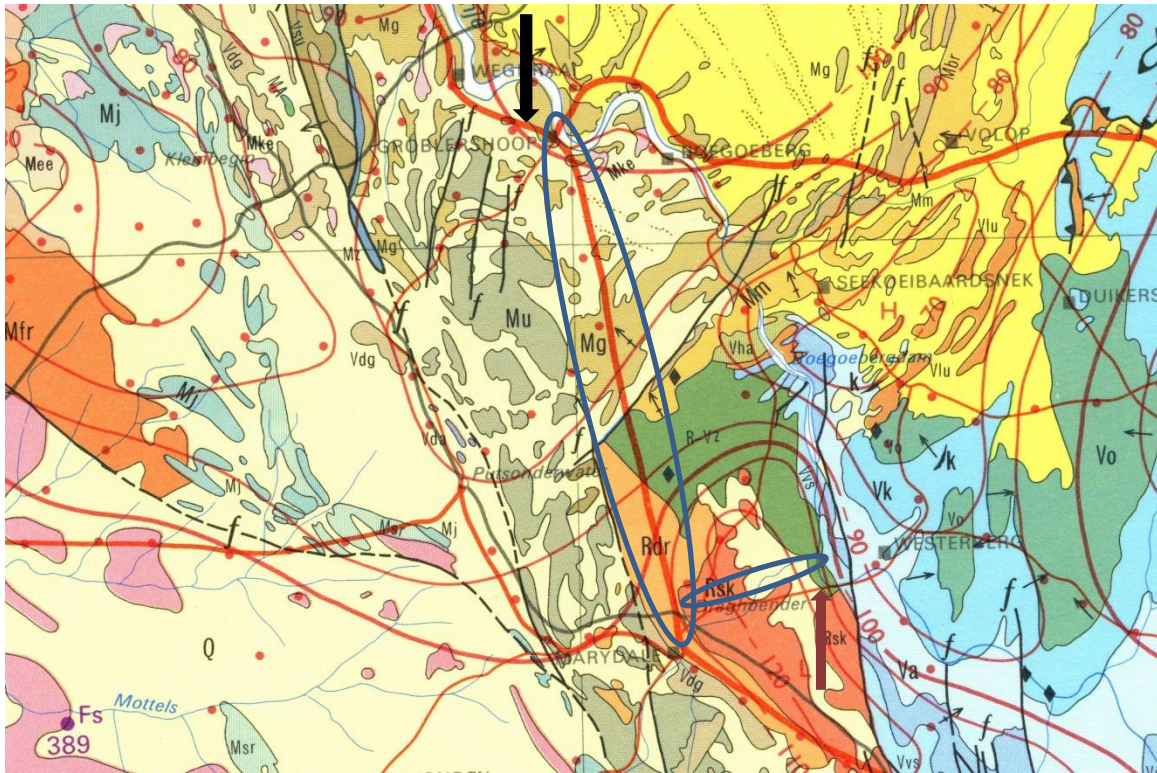


Figure 2. Geological map of the proposed powerline route between Groblershoop to the north and Fibre to the south east. Areas to be affected very are broadly outlined by blue loops. Abbreviations of the rock types are explained in Table 1. Map enlarged from the Geological Survey 1: 1 000 000 map 1984.

Symbol	Group/Formation	Lithology	Approximate Age
Q	Quaternary	Alluvium, sand, calcrete	Neogene (last 25 Ma)
Mg	Groblershoop Fm, Brulpan Group, Olifantshoek Supergroup	Schist, quartzite, metalava	2000 Ma (A)
Mu	Uitdraai Fm, Brulpan Group	Quartzite	Ca. 1780 Ma (B)
Mm	Matsap Subgroup, Volop Group,	Subgreywacke, quartzite, conglomerate	2070 Ma (C)
Vdg	Dagbreek Fm, Vaalkoppies Group	Schist, quartzite, amphibolite	2800 - 1950 Ma (A)
R-Vz	Zeekoibaart Fm,	Andesite, dactite, tuff	2630 Ma (C)
Rsk	Skalkseput Granite (intrusive)	Biotite-muskovite granite	2938 Ma (A)
Rdr	Draghoender Granite (intrusive)	Muscovite and biotite granite, gneiss	2953 Ma (A)

Table 1: Explanation of symbols for the geological map and approximate ages with the references: A = Cornell et al., 2006; B = Moen, 2006; SACS (1980).

## References

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Cowan, R., 1995. History of Life. 2<sup>nd</sup> Edition. Blackwell scientific Publications, Boston. 462pp.

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