

**Palaeontological Impact Assessment for  
Eskom Kimberley Strengthening Phase 4 Project**

**Manganore-Ferrum**

**Desktop study  
For**

**Landscape Dynamics CC**

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# Palaeontological Impact Assessment for Eskom Kimberley Strengthening Phase 4 Project

## Manganore-Ferrum

### Background

As requested here is a report for a PIA for the fourth of four proposed sections of the Eskom Kimberley Strengthening Phase 4 Project: Manganore-Ferrum (Approximately 67km Double circuit 400kV powerline from Manganore to Ferrum, including a new Manganore Tx Substation adjacent to the existing Manganore Dx Substation). According to the national legislation (National Heritage Resources Act (Act 25 of 1999)) any site to be developed must be assessed to determine the likelihood of palaeontological remains occurring there and if so then their importance and possible protection or removal.

### Terms of Reference

In order to determine the likelihood of fossils occurring in the affected area geological maps, literature, palaeontological databases and published and unpublished records must be consulted.

If fossils are likely to occur then a site visit must be made to locate and assess the fossils and their importance.

Unique or rare fossils should be collected (with the relevant SAHRA permit) and either removed to a suitable storage and curation facility (such as a Museum, geological survey or university Palaeontology department) or protected on site.

Common fossils can be sacrificed if they are of no importance but a representative collection could be made if deemed necessary.

### Locality

There are two possible routes for the powerline between Manganore and Ferrum (north east of Sishen and northwest of Kathu) shown in Figure 1. The maximum width between the northern and southern routes is 20km and this whole area is considered for the palaeontological impact assessment.

The land surface is currently under cultivation and there are numerous farms and some small towns. The topography is relatively flat.



## Geology and Palaeontology

The proposed substations and powerline routes fall within a number of geological formations as indicated in Figure 2 and Table 1, including ancient rocks of the Griqualand West Sequence of the Transvaal Sequence and young (Tertiary to Quaternary) Kalahari sands, alluvium and limestones.

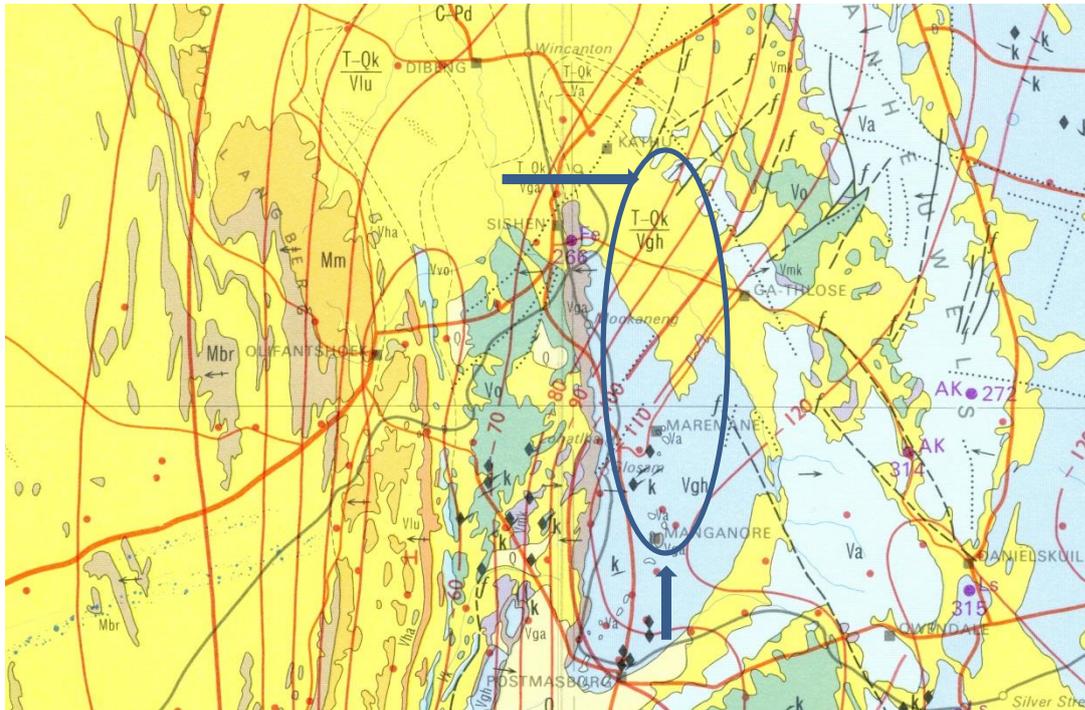


Figure 2: Geological map indicating Manganore (southern arrow) and Ferrum (northern arrow) and the area within the oval outline includes both sets of first and second alternate corridors. Symbols for geological formations are listed in Table 1; Map enlarged from Geological Survey, Pretoria; 1984, 1: 1 000 000.

Symbol	Formation	Lithology	Age
Q	Quaternary	Alluvium, calcrete, sand	Less than 2.5 Ma
T-Qk	Kalahari	Sand, limestone	Tertiary (65 – 0 Ma)
Vo	Ongeluk	Andesite	Griqualand West Sequence; Posmasburg Subgroup: 2222 Ma; Campbell Group; 2555-2516 Ma; Schmidtsdrift subgroup base 2642 Ma
Vmk	Makganyeni	Diamictite, jaspilite, sandstone	
Vga	Gamagara	Shale, quartzite, conglomerate	
Va	Asbestos Hills	Iron formation, jaspilite	
Vgh	Ghaap Plateau	Dolomite, limestone, chert	
Vsc	Schmidtsdrif	Dolomite, shale	

Table 1: Symbols for the geological map above and approximate ages from various sources.

The powerlines and substations will be built on rocks of the Ghaap Plateau formation of the Campbell Group, Ventersdorp Supergroup which range in age from 2650 – 2588 Ma (Eriksson et al., 2006) which is much too old for vertebrates and plants. Algae, fungi and bacteria had evolved by this time but were seldom preserved. These rocks are sedimentary (dolomites) and igneous (andesite) and do not appear to have any microfossils.

The unpublished records at the Evolutionary Studies Institute, University of the Witwatersrand, do not record any fossils from this area. The overlying Quaternary Kalahari sands are Aeolian and there is no record of fossils.

## **Recommendation**

Since none of the rock formations or sediments in the region is potentially fossiliferous, being too old or too young, the project to erect approximately 67km Double circuit 400kV powerline from Manganore to Ferrum, including a new Manganore Tx Substation adjacent to the existing Manganore Dx Substation), as one of the four phases of the Eskom strengthening project, may continue as far as the palaeontology is concerned. If however, any fossils are discovered during the excavations then it is strongly recommended that the fossils are rescued and a palaeontologist is called to assess their importance and make further recommendations.

No phase 2 palaeontological impact assessment is required.

## **References**

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