

**RECOMMENDED EXEMPTION FROM FURTHER PALAEOLOGICAL STUDIES:**

**PROPOSED CONSTRUCTION OF THE GUNSTFONTEIN SWITCHING STATION,  
132KV OVERHEAD POWER LINE (SINGLE OR DOUBLE CIRCUIT) AND ANCILLARY  
INFRASTRUCTURE FOR THE GUNSTFONTEIN WIND FARM NEAR SUTHERLAND,  
NORTHERN CAPE PROVINCE**

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## 1 BACKGROUND

In two separate EIA applications the development of the Gunstfontein and Soetwater Wind Farms is proposed [(Gunstfontein Wind Farm (Pty) Ltd -DEA ref no.: 14/12/16/3/3/2/826 and Soetwater Wind Farm (Pty) Ltd- DEA ref no.: 12/12/20/2370/2]. Palaeontological Heritage Impact Assessments (desktop and field based studies) have been conducted by Dr John E Almond (2016).

Both study areas are completely underlain by the fluvial Abrahamskraal Formation (Adelaide Subgroup, Lower Beaufort Group, Karoo Supergroup) and overlying Late Cenozoic superficial sediments. Dr Almond concluded that the Lower Beaufort Group bedrocks and overlying Late Cenozoic superficial sediments in the study area are generally of low palaeontological sensitivity and that construction of the proposed wind farms is unlikely to involve significant impacts on local fossil heritage resources. Due to the general lack of well-preserved fossil remains as well as the extensive superficial sediment cover, the overall significance of the impacts associated with the construction phase of the developments is considered as low.

Dr Almond deemed no further specialist palaeontological heritage studies or mitigation will be necessary pending the potential discovery or exposure of substantial new fossil remains (e.g. vertebrate bones and teeth, plant-rich fossil lenses, fossil wood or dense fossil burrow assemblages) in which case the ECO responsible for these developments should be alerted immediately. Such discoveries ought to be protected (preferably *in situ*) and the ECO should alert SAHRA (South African Heritage Research Agency) so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional paleontologist.

The specialist involved would require a collection permit from SAHRA. Fossil material must be curated in an approved collection (e.g. museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA.

## **2 OUTLINE OF PROPOSED DEVELOPMENT**

To connect the proposed Gunstfontein Wind Farm to the National Eskom grid, an on-site switching station (Gunstfontein Switching Station), a new 132kV overhead power line and ancillary infrastructure will be necessary. The infrastructure includes access tracks/roads, laydown areas and a system metering installation. The Gunstfontein Switching Station (circa 120m x 120m) will be located adjacent to the Gunstfontein Substation (EIA application – DEA ref: 14/12/16/3/3/2/826), within the proposed Gunstfontein Wind Energy Facility site, and the 132kV overhead power line will connect the Gunstfontein Switching Station to the Soetwater Switching Station.

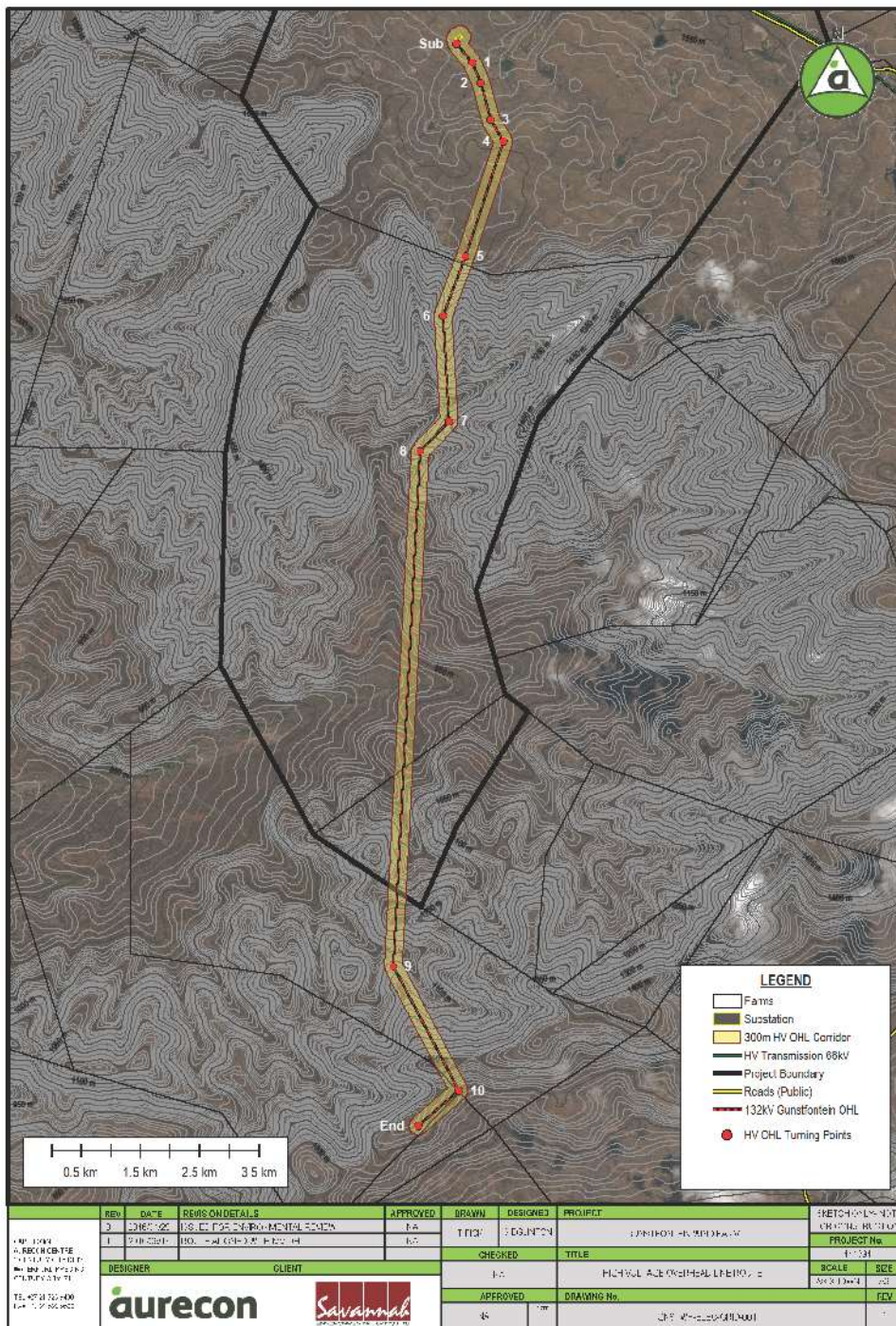
## **3 GEOGRAPHICAL LOCATION OF THE SITE**

The proposed switching station (Figure.1) is located on the Remainder of the Farm Gunstfontein 131. The power line will be routed south to the Soetwater Switching Station on the Farm Leeuwe Hoek 183, and the route will cross the following farms:

The Remainder of the Farm Gunstfontein 131.  
The Remainder of the Farm Boschmans Hoek 177;  
The Remainder of the Farm Wolvenhoek 182;  
The Remainder of the Farm Zwanepoelshoek Re/184; and  
The Remainder of the Farm Leeuwe Hoek 183;

The proposed 132kV powerline, Gunstfontein switching station and ancillaries are located wholly within the study area previously assessed by Dr Almond for the Gunstfontein & Soetwater Wind Energy Facilities (see Figure 1).

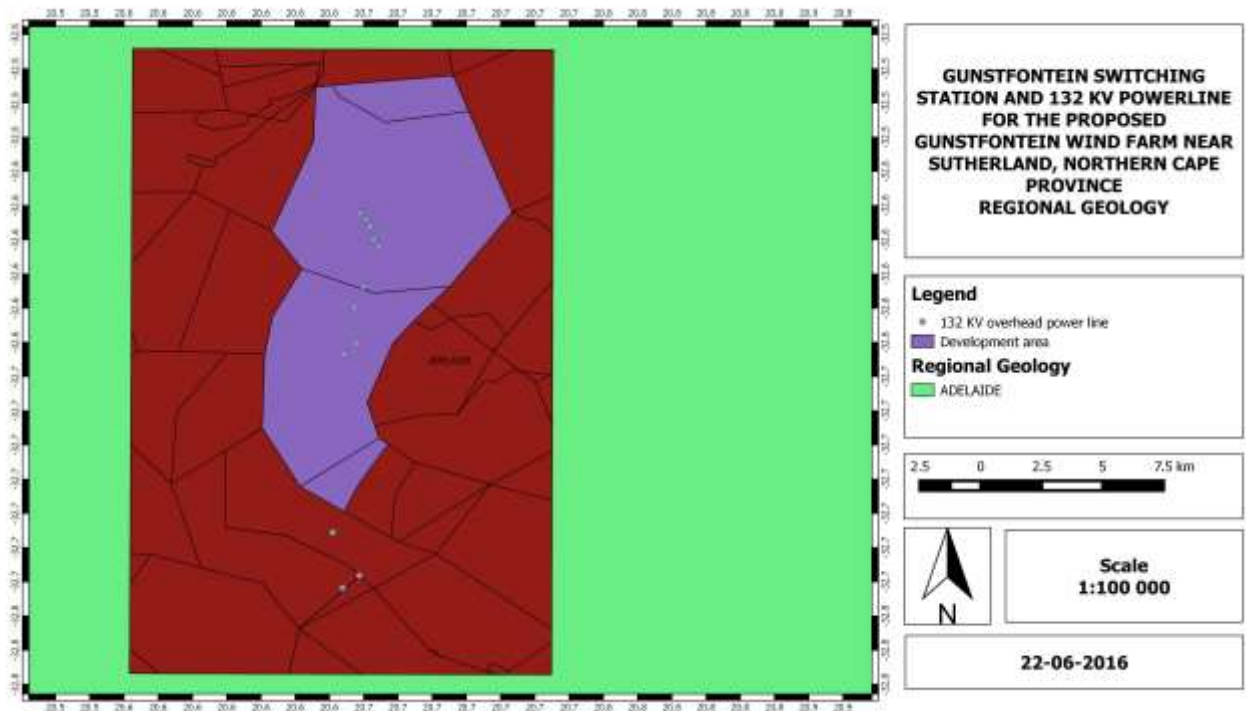
The study area near Sutherland in the Northern Cape has a semi-arid climate and sparse vegetation. Bedrock exposure is limited by extensive superficial deposits, especially in areas of low relief. The vegetation comprise of Karoo *bossieveld* vegetation (Central Mountain Shale Renosterveld and Tanqua Escarpment Shrubland).



**Figure 1:** Location of the proposed Gunstfontein Switching Station and 132 KV power line for the proposed Gunstfontein Wind Energy Facility near Sutherland, Northern Cape Province. Map provided by Savannah Environmental.

## 2. GEOLOGICAL BACKGROUND

The development area of the 132KV overhead power line and Gunstfontein switching station is completely underlain by the fluvial Abrahamskraal Formation (Adelaide Subgroup, Lower Beaufort Group, Karoo Supergroup) and overlying Late Caenozoic superficial sediments (Fig.2).



**Figure 2.** The surface geology of the proposed Gunstfontein development area near Sutherland, Northern Cape Province. The development area is completely underlain by the fluvial Abrahamskraal Formation (Adelaide Subgroup, Lower Beaufort Group, Karoo Supergroup) and overlying Late Caenozoic superficial sediments.

### **3. PALAEOLOGICAL HERITAGE**

The general palaeontological sensitivity of the Beaufort Group sediments is rated as high to very high (Almond and Pether 2008). These continental sediments have produced one of the richest fossil records of terrestrial plants and animals of Permo-Triassic age in the world (McCarthy and Rubidge 2005, Smith *et al.* 2012).

Bedrock exposures in the study area are generally very poor due to the cover by superficial sediments (colluvium, alluvium, soils, calcrete) and vegetation. During a field based assessment, Dr Almond recorded the following fossil heritage: fossil bone fragments and possible disarticulated bony fish scales, trace fossil assemblages (small-scale invertebrate burrows, possible plant root casts), glossopterid leaves, moulds of woody plant material and silicified wood. No fossils were observed within the various Late Cenozoic superficial deposits.

### **4. CONCLUSIONS & RECOMMENDATIONS**

Although the palaeontological sensitivity of the Adelaide Subgroup is rated as high the bedrock exposure levels in the study region are generally very poor due to superficial sediments cover (alluvium, calcrete, colluvium, soils) and vegetation. Due to the absence of well-preserved fossil remains in the development area, the overall significance impact associated with the construction phase of the proposed development is considered as low. No further specialist palaeontological heritage studies or mitigation measures are considered necessary, pending the potential discovery or exposure of substantial new fossil remains during the development.

Should fossil remains be discovered during any phase of construction, either on the surface or exposed by fresh excavations, the ECO responsible for these developments should be alerted. Such discoveries ought to be protected (preferably *in situ*) and the ECO should alert SAHRA (South African Heritage Research Agency) so that appropriate mitigation (*e.g.* recording, sampling or collection) can be taken by a professional paleontologist.

The specialist involved would require a collection permit from SAHRA. Fossil material must be curated in an approved collection (*e.g.* museum or university collection) and all fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA.

## 5. REFERENCES

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