

**Phase 1 Heritage Impact Assessment of proposed new
agricultural development areas on farm Bultfontein
327 near Prieska, NC Province.**



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Summary

A Phase 1 Heritage Impact Assessment was carried out on the farm Bultfontein 327 situated near Prieska in the Northern Cape Province, as part of an application for agricultural development. Vaalian aged basement rocks within the affected area (Ghaap Group, Transvaal Supergroup) are covered in places by well-developed superficial sediments made up of basin -accumulated Quaternary wind-blown sand deposits, variable clasts of surface gravels, and reworked calcretes. Results from a foot survey of the lower valley fills near the Orange River (pipeline and pump station) as well as upland areas (pipeline and agricultural area) show no evidence of above-ground, *in situ* Stone Age archaeological sites. There are also no indications of rock art, prehistoric structures, graves or historically significant structures older than 60 years within the areas that were surveyed. Given the nature and scale of the proposed development the development footprint is not considered to be palaeontologically or archaeologically vulnerable. The survey area is assigned a rating of Generally Protected C (GP.C). The development can proceed provided that activities are confined to the proposed footprint.

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Introduction

A Phase 1 Heritage Impact Assessment was carried out on the farm Bultfontein 327 situated near Prieska in the Northern Cape Province, as part of an application for agricultural development (**Fig. 1 & 2**).

The heritage significance of the affected area was evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant heritage information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection.

The task also involved identification and assessment of possible heritage within the proposed project area, in accordance with section 9(8) and appendix 6 (“Specialist reports”) of the NEMA EIA Regulations, 2014 , whereby the specialist report takes into account the following terms of reference:

- Identify and map possible heritage sites and occurrences using available resources.
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

The study area is rated according to field rating categories as prescribed by SAHRA as well as according to a probability of impact methodology for assessing the Duration (time scale), Extent (spatial scale) and the Probability of occurrence of potential impacts (**Table 1**).

Locality data

1:50 000 scale topographic maps: 2922AD Koegasbrug

1:250 000 scale geological map 2922 Prieska

General Site coordinates:

Area 1 29°21'23.91"S 22°29'45.89"E

Area 2: 29°21'42.42"S 22°29'28.85"E

Area 3: 29°20'57.09"S 22°29'35.30"E

Pipeline: A) 29°21'28.30"S 22°28'51.80"E

B) 29°23'25.89"S 22°28'0.83"E

Pump House: 29°23'26.44"S 22°28'0.69"E

The proposed development includes a agricultural area, pump house and proposed water pipeline from the Orange River providing water to the former. The study area is located on the farm Bultfontein 327, approximately 40 km northwest of Prieska, 30 km west-southwest of Niekerkshoop, and about 4km north of the Orange River (**Fig. 3 & 4; 6 & 7**).

Background

The geology of the region was compiled by Malherbe and Moen (1996) (**Fig. 5**). Oldest bedrock sediments in the area are made up of Transvaal Supergroup carbonate rocks (Late Archaean / Early Proterozoic, c. 2.56 Ga) and banded iron formations (BIF) that possibly reflect Early Proterozoic environmental conditions following iron deposition as a result of the build-up of free oxygen in the oceans by cyanobacterial photosynthesis. Localized outcrops of Early Permian Dwyka sediments represent valley and inlet fill deposits left behind on the Transvaal basement rocks by retreating glaciers about 300 million years ago (Visser *et al.* 1990; Johnson *et al.* 2006). Dwyka mudrocks have previously yielded trace fossils, including fish and invertebrate trackways and as well as micro-fossil remains (foraminifera, bryozoans, sponge spicules and radiolaria) and a variety of invertebrates (MacRae, 1999). Fossil plants include lycopods, Glossopterids, fossilized wood and plant micro-remains (spores and pollen) (Anderson and McLachlan 1976; MacRae 1999). Paleogene fossil assemblages are known from a crater-lake deposit within a volcanic pipe at Stompoor

south of Prieska and include a diversity of fish, frogs, reptiles, insects, and palynological remains (Smith 1988). There is currently no record of fossil remains or exposures from Dwyka outcrop at Engeldewilgeboomfontein 22 and Farm 23 and Quaternary sediments in the area. Fluvial deposits from the ancient Koa Valley northwest of Prieska and south of Pofadder, has yielded fossil vertebrate bone as well as fossil wood (Maglio 1978; De Wit and Bamford 1993; Partridge and Maud 2000). Early Cenozoic river terraces (diamond placers) are located several tens of meters above the present level of the Orange River, where diamondiferous gravel deposits often occupy potholes along the banks of the river.

No Quaternary fossils have been explicitly reported from the vicinity of Prieska, but a fossilized horn core of an extinct alcelaphine has been retrieved from alluvial sediments along the Ongers River near Britstown, while Florisian type faunal remains have been excavated from an archaeological site at Bundu Farm Pan near Copperton (Brink *et al.* 1995; Kiberd 2006).

The archaeological heritage of the region is rich and varied and includes Stone Age archaeology, rock art localities, structural remnants dating back to the Anglo Boer War and its aftermath, as well as graveyards and other historical structures dating more than 60 years ago. The region has yielded numerous Early, Middle and Later Stone Age sites associated with pans, while the landscape in general is characterized by low density surface scatters (Beaumont 1995; Kiberd 2006). MSA surface scatters have also been recorded at Elswater, Brakfontein and Nuwejaarskraal near Douglas. Rock engravings have been recorded in the younger valley fills along the steeper slopes of the Asbesberge mountain range. In addition, rock art sites have been recorded on a number of farms around Prieska, including Kleindoring, Wonderdraai and Omdraaisvlei (van Riet Low 1945). Further away, stone pipes and LSA artefacts have been recorded on the farm Doornkuil near Britstown, while prehistoric graves and clay pottery have been recorded along the Orange River in the vicinity of Douglas. Widespread stone-walled ruins of two large historical terrains are found on the farms Kliphuis 29 and Engeldewilgeboomfontein 22, covering about 75 ha and 4.5 ha at, respectively. The sites are associated with the asbestos mining industry that prevailed in the region more than a hundred years ago.

Results, Impact Statement and Recommendation

Vaalian aged basement rocks within the affected area (Ghaap Group, Transvaal Supergroup) are covered in places by well-developed superficial sediments made up of

basin -accumulated Quaternary wind-blown sand deposits, variable clasts of surface gravels, and reworked calcretes. Results from a foot survey of the lower valley fills near the Orange River (pipeline and pump station) as well as upland areas (pipeline and agricultural area) show no evidence of above-ground, *in situ* Stone Age archaeological sites. There are also no indications of rock art, prehistoric structures, graves or historically significant structures older than 60 years within the areas that were surveyed. Given the nature and scale of the proposed development the development footprint is not considered to be palaeontologically or archaeologically vulnerable. The survey area is assigned a rating of Generally Protected C (GP.C). The development can proceed provided that activities are confined to the proposed footprint.

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DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference. I have no interest in secondary or downstream developments as a result of the authorization of this project.

A handwritten signature in black ink, appearing to read 'L Rossouw', is centered on the page. The signature is fluid and cursive, with the first letter 'L' being particularly large and stylized.

20 / 05 / 2019

Tables and Figures

Table 1. Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction



Figure 2. Aerial view of the study area in relation to position of Prieska and Niekerkshoop.

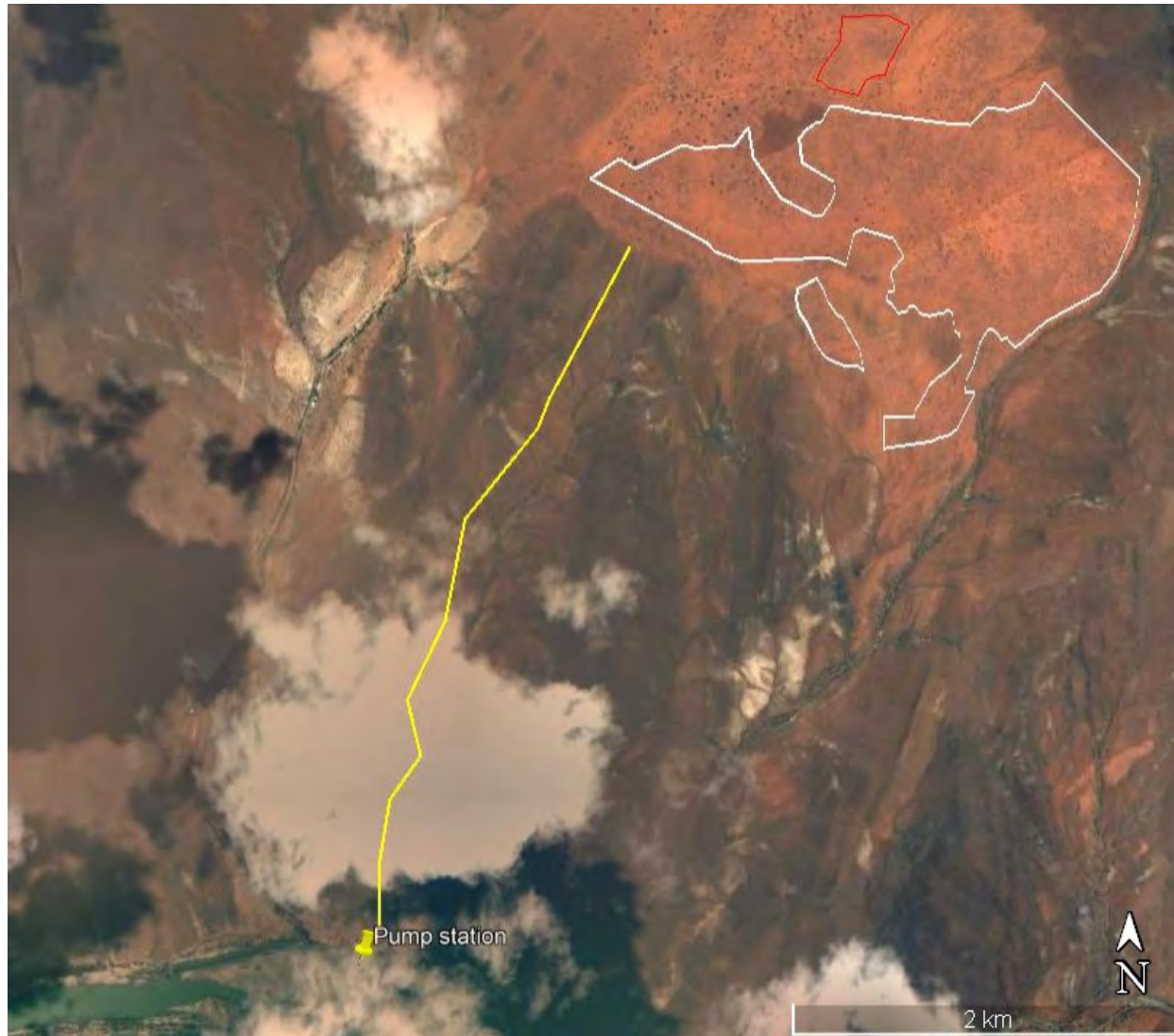


Figure 3. Aerial view of the proposed footprint.

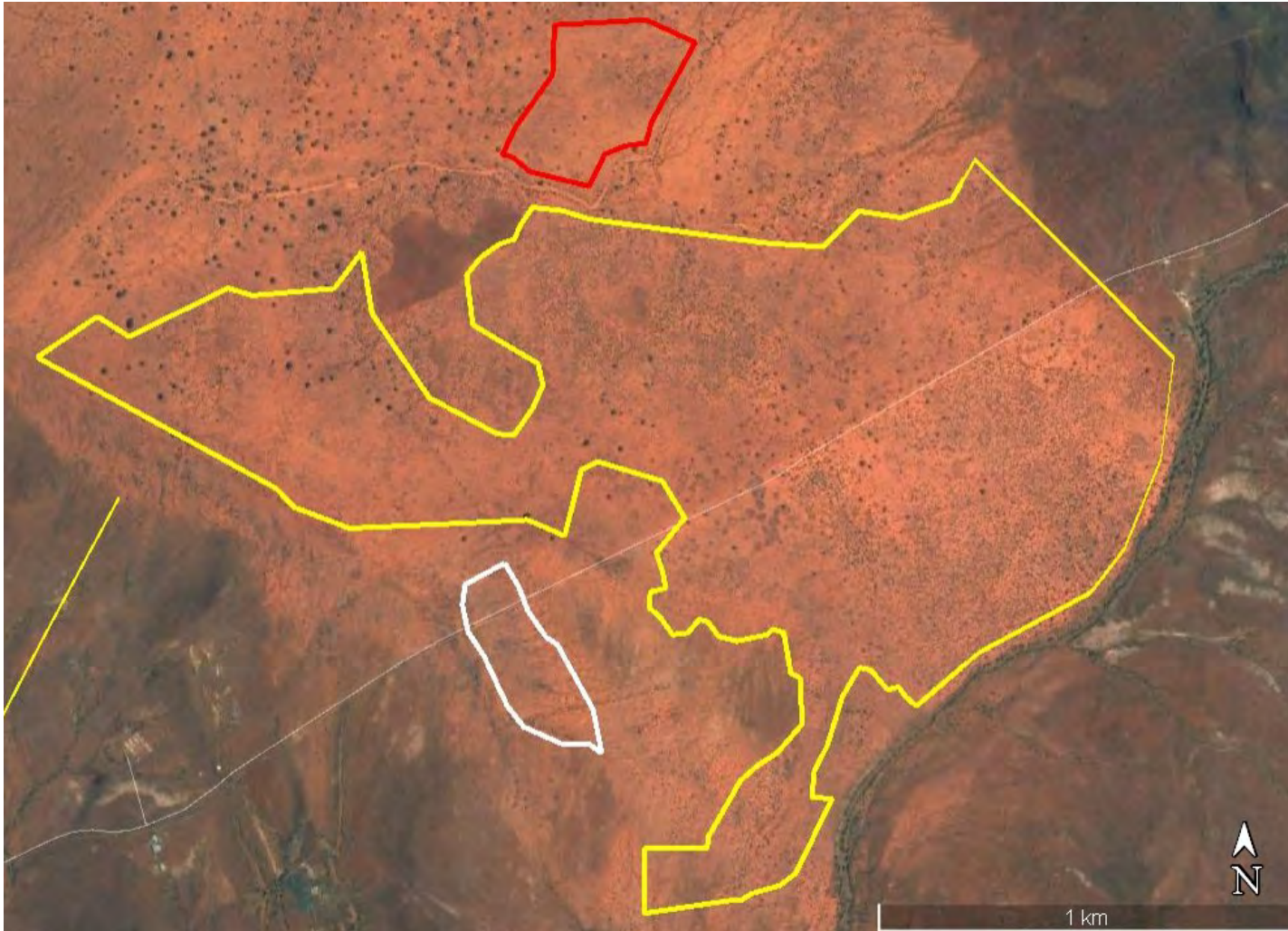


Figure 4. Aerial view of the proposed agricultural area.



Figure 5. Oldest bedrock sediments in the region are made up of Late Archaean carbonate rocks (Vo) and banded iron formations (BIF) of the Ghaap Group (Vka, Transvaal Supergroup). Superficial deposits are made up of Tertiary calcretes, variable clasts of surface gravels and scree, Quaternary wind blown sands and alluvial overbank sediments along the Orange River (portion of 1:250 000 scale geological map 2922 Prieska). Study area marked by red star



Figure 6. General view of the proposed development area, looking northeast.



Figure 7. The site is capped by well-developed windblown sand deposits



Figure 8. General view of the main development area looking west (left) and north (right).



Figure 9. Archaeologically sterile windblown sand deposits. Scale 1 = 10 cm





Figure 10. Evidence of ongoing farm activities within the study area.



Figure 11. Evidence of ongoing farm activities within the study area.



Figure 12. General view of the area along the proposed pipeline route. Calcretes (right), surface gravels and scree (left) are widespread on the landscape.



Figure 13. Figure 14. Basement rocks are represented by Ghaap Group banded iron formations.



Figure 15. General view of the Orange river.