

**Phase 1 Heritage Impact Assessment for two
agricultural pivot localities on the farm Gladium (Kloof
143), Niekerkshoop, NC Province.**

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Summary

A Phase 1 Heritage Impact Assessment was carried out following the unlawful commencement of listed activities (rectification in terms of Section 24G of NEMA) on the farm Gladium (Kloof 143), NC Province. Gladium is located within the Asbesberge mountain range, approximately 30 km north of Prieska and 10 km south of Niekerkshoop. The affected areas include one 5ha site designated Kleinloof and one 5ha site designated Diamantgat. Visibility of outcrop was very limited given the generally low topography terrain and presence of a well-developed superficial (agricultural) overburden at Kleinkloof and Diamantgat. Both sites have been severely degraded by previous farming activities (pivots). Investigation of the landscape immediately surrounding the sites suggests that potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the study areas was most probably low. Both sites are not considered to be palaeontologically or archaeologically vulnerable and are assigned a rating of Generally Protected C (GP.C).

Introduction

A Phase 1 Heritage Impact Assessment was carried out following the unlawful commencement of listed activities (rectification in terms of Section 24G of NEMA) involving two separate agricultural pivots on the farm Gladium (Kloof 143), NC Province (**Fig. 1**). The survey is required as a prerequisite for new development in terms of the National Heritage Resources Act 25 of 1999. In terms of Section 38 of the National Heritage Resources Act 25 of 1999, the survey is required as a prerequisite for any development that will change the character of a site exceeding 5 000 m² in extent. The task involved identification of possible archaeological and paleontological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

In this regard, categories relevant to the proposed development are listed in Section 34 (1), Section 35 (4), Section 36 (3) and Section 38 (1) of the NHR Act and are as follows:

34. (1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

35 (4) No person may, without a permit issued by the responsible heritage resources authority—

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
- *b*) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;

36 (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;

- (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

- The construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of the site
 - a) exceeding 5000 m² in extent; or
 - b) involving three or more existing erven or subdivisions thereof; or
 - c) involving three or more subdivisions thereof which have been consolidated within the past five years;
- The rezoning of a site exceeding 10 000 m²; or
- Any other category of development provided for in regulations by the South African Heritage Resources Agency (SAHRA).

Terms of Reference

The task involved the following:

- 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.

Methodology

The heritage significance of the affected area was evaluated 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. Maps and aerial photographs (incl. Google Earth) were consulted and integrated with data acquired during the on-site inspection.

Field Rating

Site significance classification standards prescribed by SAHRA (2005) were used to indicate overall significance and mitigation procedures where relevant (**Table 1**).

Locality data

1 : 50 000 scale topographic map 2922BD Niekerkshoop

1 : 250 000 scale geological map 2922 Prieska

Gladium is located within the Asbesberge mountain range, approximately 30 km north of Prieska and 10 km south of Niekerkshoop. The affected areas include one 5ha site designated Kleinloof and one 5ha site designated Diamantgat (**Fig. 2 & 3**). Site center coordinates of the survey areas are as follows:

Kleinkloof: 29°15'54.30"S 22°56'17.02"E

Diamantgat 29°12'56.44"S 22°55'22.23"E

Geology

Kloof 143 is primarily underlain by banded ironstone, haematite, crocidolite and chert layers located in the basal facies of the Ghaap Group (Asbestos Hills Subgroup, Transvaal Supergroup) (**Fig. 4**). Older strata lower down in the facies (e.g. Cambell Rand Subgroup) are exposed along the Orange River south and west of the study area and consist of stromatolite- and microfossil-bearing dolomite, dolomitic limestone and chert members, that were formed by the precipitation of carbonate rocks when colonies of stromatolites thrived in shallow, tropical marine environments towards the end of the Archaean Eon, 2.6 billion years ago. Localized outcrops of by Dwyka Group tillites (Karoo Supergroup, Mbizane Formation) are located to the south and southeast of the study area and represent valley and inlet fill deposits left behind on Ventersdorp basement rocks by retreating glaciers about 300 million years ago. The Dwyka-aged palaeovalleys bear evidence of glaciated pavements, consisting of well-preserved polished surfaces striations on basement rocks, which are found throughout the region. Late Cenozoic surface calcretes occur extensively to the east of the Asbesberge. The basement rocks at Kloof 143 are covered in places by superficial

deposits that are made up of variable clasts of surface gravels, reworked calcretes, Quaternary sands and sandy soils (**Fig. 5 & 6**).

Background

The banded iron formations (BIF) at Gladiadam 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. Paleogene fossil assemblages are known from a crater lake deposit within a volcanic pipe at Stompoor near Prieska and include a diversity of fish, frogs, reptiles, insects, and palynological remains (Smith 1988). Fluvial deposits from the ancient Koa Valley northwest of Prieska and south of Pofadder, has yielded fossil vertebrate bone as well as fossil wood (Partridge and Maud 2000). 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 footprint in the area are primarily represented by 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 Stone Age archaeological footprint in the region is represented by 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 located near the eastern and south-eastern margins of the Asbesberg (van Riet Low 1948). In addition, rock art sites have been recorded on a number of farms around Prieska, including Kleindoring, Wonderdraai and Omdraaisvlei. Historical ruins and graveyards associated with the asbestos mining industry during the first half of the 20th century are located at Kliphuis and Engeldewilgeboomfontein north of Prieska. 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.

Field Assessment

Visibility of outcrop was very limited given the generally low topography terrain and presence of a well-developed superficial (agricultural) overburden at Kleinkloof and Diamantgat (**Fig. 7 & 8**). Both sites have been severely degraded by previous farming activities (pivots). Investigation of the landscape immediately surrounding the sites suggests that potential impact on *in situ* Stone Age archaeological material, graves, rock engravings, prehistoric structures or historically significant building structures older than 60 years within the study areas was most probably low.

Impact Statement and Recommendation

The geology of area reflects Early Proterozoic environmental conditions while the farm itself is located within a region that has previously yielded ample archaeological evidence of prehistoric human occupation. However the nature of the existing developments suggests very low impact on Transvaal Supergroup strata. The Diamantgat and Kleinkloof sites are characterized by flat terrain, capped by well-developed residual soil overburden that has been severely degraded by farming activities (pivots) and are not considered to be palaeontologically or archaeologically vulnerable. Both sites are assigned a rating of Generally Protected C (GP.C).

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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 and have no interest in secondary or downstream developments as a result of the authorization of this project.

Yours truly,

A handwritten signature in black ink, appearing to read "L Rossouw". The signature is written in a cursive style with a large initial "L" and "R".

12 / 09 / 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 1. Map of the two pivot/agricultural sites (white and yellow polygons) on the farm Gladium in relation to the position of Niekerkshoop.



Figure 2. Aerial view of the Kleinkloof footprint.



Figure 3. Aerial view of the Diamantgat footprint.

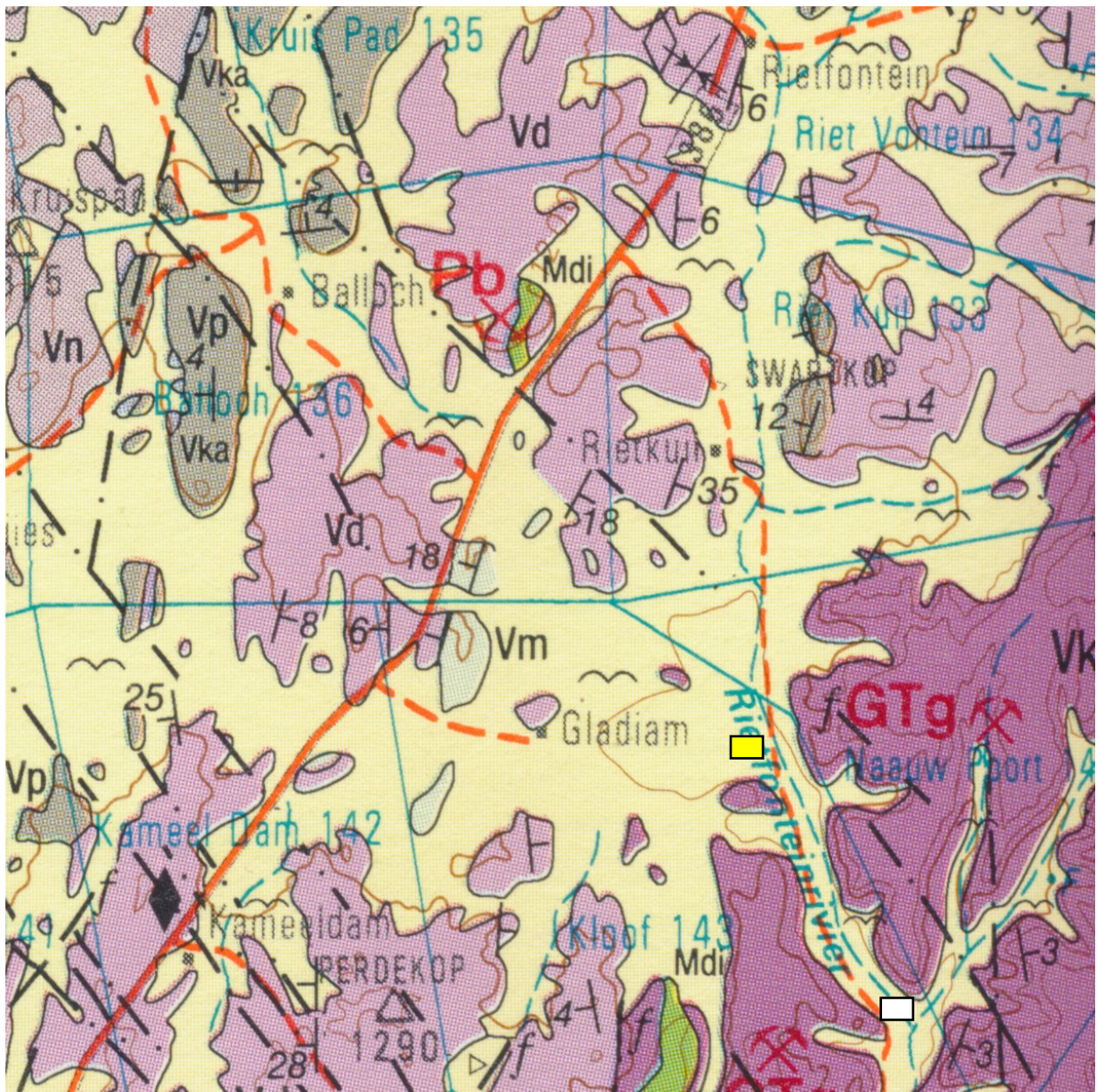


Figure 4. According to the 1: 250 000 scale geological map 2922 Prieska, the study areas (white and yellow rectangles) are primarily underlain by rocks belonging to the basal facies of the Ghaap Group (*Vk*, *Vd*, Asbestos Hills Subgroup, Transvaal Supergroup).



Figure 5. Variable clasts of surface gravels, Quaternary sands and sandy soils capping Ghaap Group rocks including banded ironstone, haematite, crocidolite and cherts.



Figure 6. Quaternary-aged wind-blown sand overburden.
Scale 1 = 10 cm.



Figure 7. . General view of degraded agricultural overburden at Kleinkoof looking northeast (above) and southeast (below).



Figure 8. General view of degraded agricultural overburden at Diamantgat, looking west.