

Phase 1 Heritage Impact Assessment of a new Landfill
Site at Viljoenskroon, FS Province.

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Summary

A phase 1 Heritage Impact was carried out for the development of a proposed new landfill site at Viljoenskroon in the Free State Province. The study area is underlain by basaltic-andesitic lavas and minor quartzite of the early Proterozoic Pretoria Group, Hekpoort Formation (Transvaal Supergroup) that are capped by geologically recent (Quaternary) aeolian sand and residual soils. The Hekpoort Formation is not considered to be palaeontologically sensitive. There is also little chance of finding fossil material within the superficial overburden because of a lack of suitable Quaternary-aged alluvium at the site. If, however, in the unlikely event that any localized fossil material is discovered within the superficial overburden during the construction phase of the project (i.e. modern-looking but more or less lithified animal bones and teeth), a professional palaeontologist must be called in immediately to confirm and record the finds. A foot survey of the terrain revealed no evidence for the accumulation and preservation of intact fossil material within these superficial Quaternary sediments. The pedestrian survey revealed no indication of *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock art (engravings), prehistoric structures, graves or historically significance buildings older than 60 years within the boundaries of the study area. While the region overall is represented by a rich archaeological and historical footprint, the study area is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development footprint.

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Introduction

A phase 1 Heritage Impact was carried out for the development of a proposed new landfill site at Viljoenskroon in the Free State Province (**Fig. 1**). The assessment is required as a prerequisite for new development in terms of the National Environmental Management Act and is also called for in terms of the National Heritage Resources Act (NHRA) 25 of 1999. The region's unique and non-renewable archaeological heritage sites are 'Generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. As many such heritage sites are threatened daily by development, both the environmental and heritage legislation require impact assessment reports that identify all heritage resources in the area to be developed, and that make recommendations for protection or mitigation of the impact of such sites.

The NHRA identifies what is defined as a heritage resource, the criteria for establishing its significance and lists specific activities for which a heritage specialist study may be required. 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

Maps: 1:50 000 scale topographical map 2726 BB Viljoenskroon

1:250 000 scale geological map 2726 Kroonstad

The affected area covers 5000 m², located on farmland currently used for crop production (maize and soya beans) about 3 km due west of Viljoenskroon on the R76 provincial road, Free State Province (**Fig. 2 & 3**).

General Site Coordinates (**Fig. 2**):

- A) 27°12'46.84"S 26°58'43.50"E
- B) 27°12'44.72"S 26°59'2.37"E
- C) 27°13'3.36"S 26°59'6.67"E
- D) 27°13'8.05"S 26°58'42.21"E
- E) 27°12'55.87"S 26°58'38.04"E

Background

The study area is underlain by basaltic-andesitic lavas and minor quartzite of the early Proterozoic Pretoria Group, Hekpoort Formation (Transvaal Supergroup) that are capped by geologically recent (Quaternary) aeolian sand and residual soils (**Fig. 4 - 6**). The Hekpoort Formation was formed when lavas were extruded during the deposition of the underlying Boshhoek Formation sandstones (Reczko et al. 1995; Eriksson et al. 2006). It is not considered to be palaeontologically sensitive. The nearby Vaal River (\pm 30 – 40 km to the north and northwest of Viljoenskroon) dates back to the late Cretaceous and are one of the principal fluvial conduits in southern Africa (Marshall 1996; Partridge & Maud 2000). The alluvial formations of the Vaal River basin are best developed along the lower 300 km of the river. These alluvial formations are well known for their unique record of the Pleistocene. Numerous Early Stone Age hand axes as well as the remains of Pleistocene mammalian fossils have been recovered in the region, from gravel deposits 20 m to 50 m above the current

riverbed. Early to Middle Stone Age artifacts are derived from the Vaal gravels and include an abundance of Acheulian (Early Stone Age) hand axes, cleavers and core-axes, primarily made from quartzite (Sohnge *et al.* 1937; Cooke 1949). Plentiful signs of Stone Age human occupation are also visible on the landscape in and around the Vredefort Dome World Heritage Site near Parys, located about 40 km northeast of Viljoenskroon (**Fig. 7**). Late Iron Age stone-walled settlements built by Sotho-Tswana speakers also form part of the rich cultural heritage of the Vredefort Dome (eg. Askoppies and Buffelskloof), with research showing that Sotho-Tswana speaking peoples densely populated this area from 1400 to 1800 AD (Maggs 1976; Pelser 2004). European settlement occurred from 1836 (Voortrekkers) while establishment of the Boer republics and the discovery of diamonds and gold further contributed to the distinctive historical character of the region. There are plentiful rock art sites with engravings recorded in the Lower Vaal River Basin including the area around Bothaville on the farms Deelfontein, Diepfontein, Doornhoek and Geelfontein and paintings around Parys on the farms Buffelskloof and Parsons Rus (van Riet Lowe 1941). There is currently no record of engraving sites in the vicinity of Viljoenskroon. Other tangible heritage resources in the region include mid- 19th century farmstead structures, old gold mines, Anglo Boer War remains and late 19th century town architecture (eg. Venterskroon, Reitzburg, Vredefort and Parys) (Jacobs 1952). The town of Viljoenskroon was laid out on the farm Mahemskuil in 1921 and attained municipal status in 1925 (Raper 1987).

Field Assessment

A foot survey of the terrain revealed no evidence for the accumulation and preservation of intact fossil material within these superficial Quaternary sediments. The pedestrian survey revealed no indication of *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock art (engravings), prehistoric structures, graves or historically significance buildings older than 60 years within the boundaries of the study area.

Impact Statement and Recommendation

The affected area is underlain by intrusive volcanic rocks that are considered to be of no paleontological significance. There is also little chance of finding fossil material within the superficial overburden because of a lack of suitable Quaternary-aged

alluvium at the site. If, however, in the unlikely event that any localized fossil material is discovered within the superficial overburden during the construction phase of the project (i.e. modern-looking but more or less lithified animal bones and teeth), a professional palaeontologist must be called in immediately to confirm and record the finds. In the meantime, ex situ remains must be wrapped in paper towels or heavy duty tin foil and stored in a safe place. The material should not be washed or cleaned in any way. In situ material must be kept in place and protected from further damage by covering it with light but rigid object like a box, bucket or metal sheet until further confirmation by the palaeontologist.

The terrain in general is regarded as of low archaeological significance and is assigned a rating of Generally Protected C (GP.C). As far as the archaeological and palaeontological heritage is concerned, the proposed development may proceed with no additional heritage assessments necessary, provided that all excavation activities are restricted to within the boundaries of the development 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 and have no conflicting interests in the undertaking of the activity.

A handwritten signature in black ink, appearing to read 'L Rossouw', with a large, stylized initial 'L'.

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Tables & 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

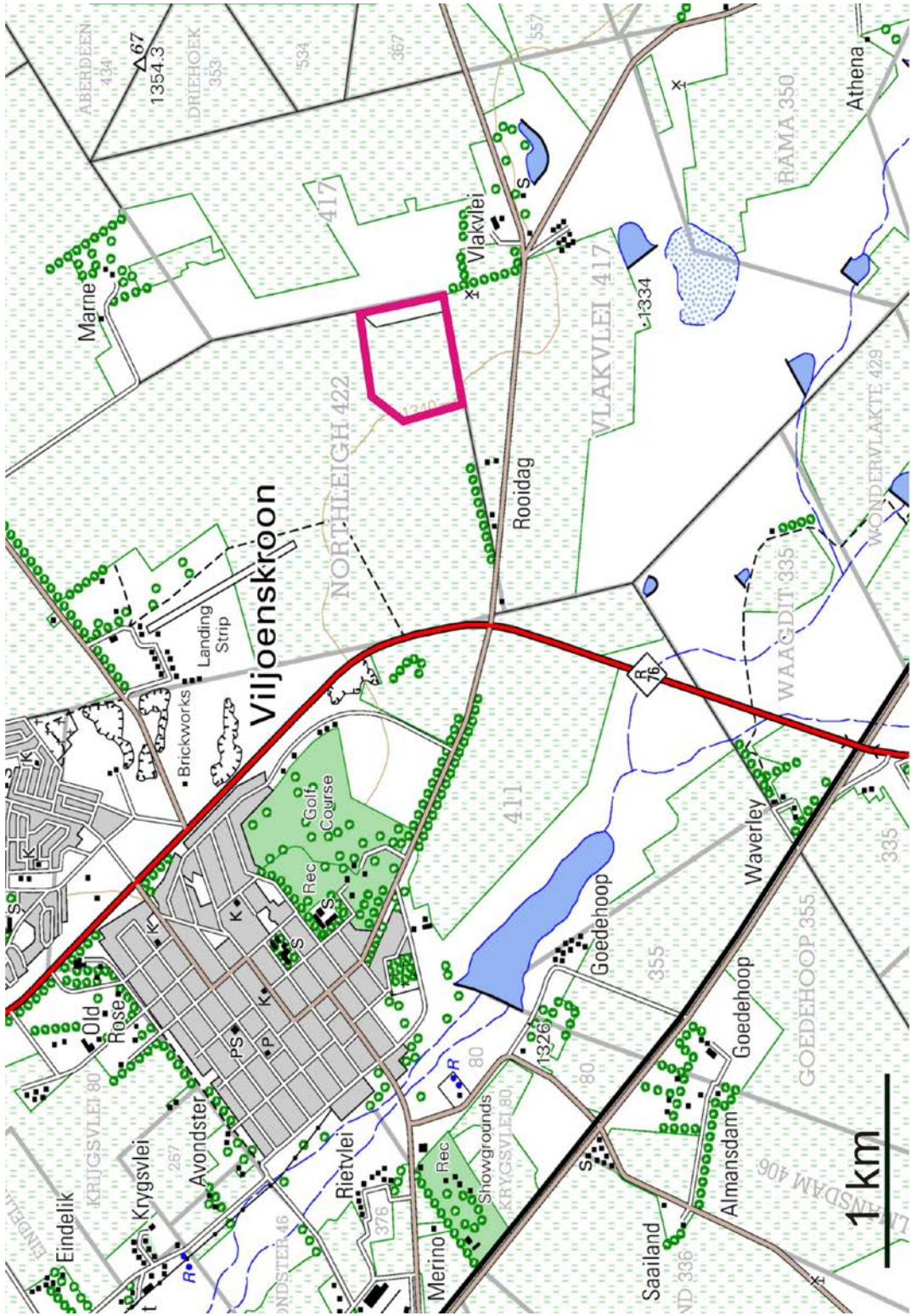


Figure 1. Map of the proposed new landfill site (portion of 1:50 000 scale topographic 2726 BB Viljoenskroon).



Figure 2. Aerial view of the study area.



Figure 3. General view of the study area, looking southwest (top left), west (top center), south (top right & below).

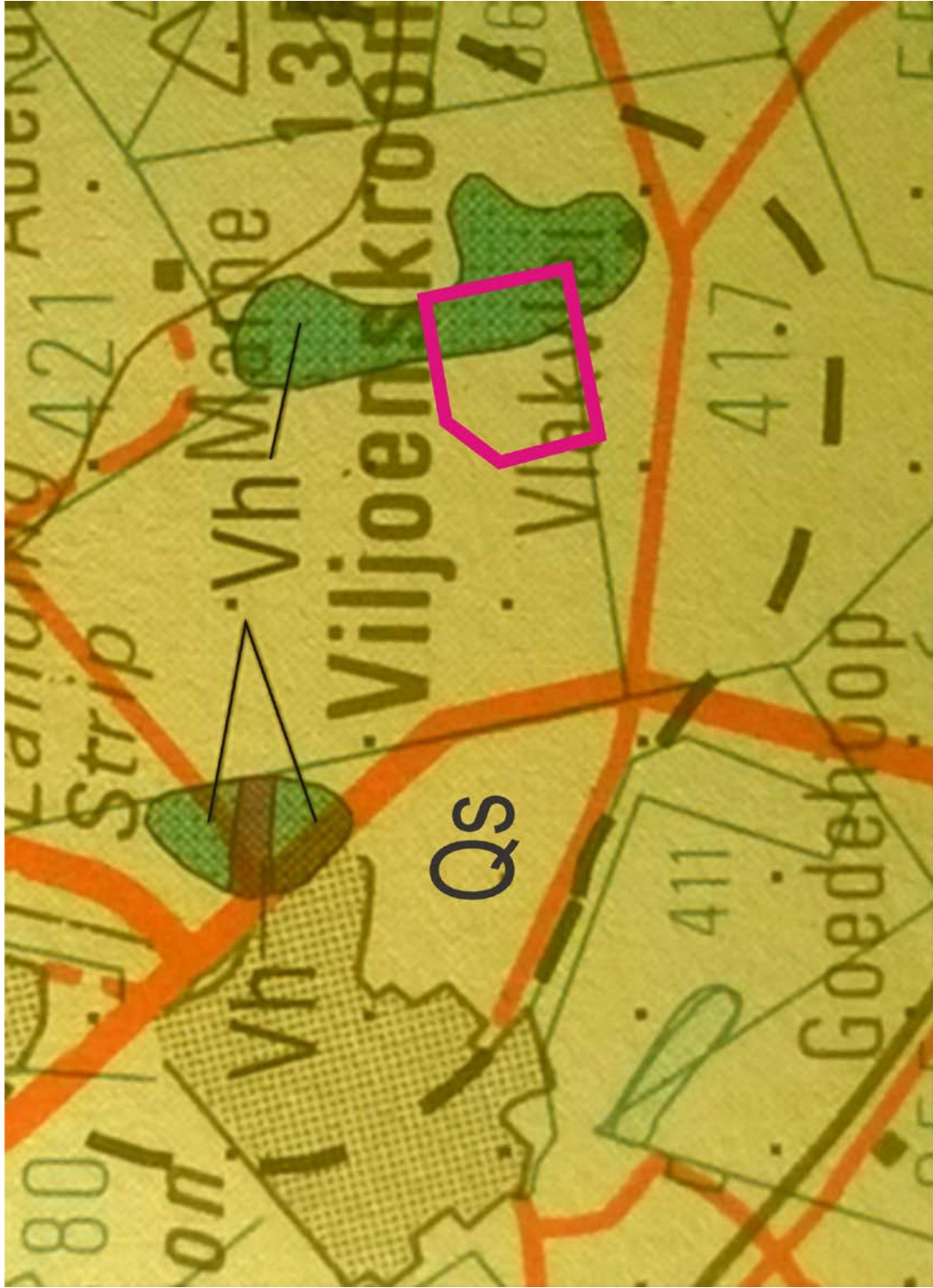


Figure 4. The study area is underlain by basaltic-andesitic lavas and minor quartzite of the early Proterozoic Pretoria Group, Hekpoort Formation, *Vh* (Transvaal Supergroup) that are capped by geologically recent aeolian sand and residual soils (portion of 1:250 000 scale geological map 2726 Kroonstad).



Figure 5. Exposed volcanic rock capped by unconsolidated wind-blown sand.
Scale 1 = 10 cm.



Figure 6. the terrain is capped by a thick deposit of geologically recent aeolian sand and residual soils.



Figure 7. Aerial view of region as discussed in report.