Phase 1 Heritage Impact Assessment of a new borrow pit on the farm Sydenham 445/RE, near Bloemfontein, FS Province.

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Executive Summary

- A Phase 1 Heritage Impact Assessment was carried out for the proposed development of a new borrow pit located south of Bloemfontein, near the N6 National Road en route to Reddersburg.
- The study area is entirely underlain by an outcrop of igneous dolerite.
- Investigation of exposed topsoils show no evidence of Stone Age archaeological material, capped or distributed as surface scatters on the landscape.
- There is also no evidence for the accumulation and preservation of intact fossil material within the Quaternary sediments (topsoils) covering the underlying sedimentary rocks.
- No graves or graveyards were recorded.
- Historical buildings or structures older than 60 years are absent from the site.
- The impact of the proposed development on palaeontological and archaeological heritage remains is likely to be low.
- The probability of locating palaeontological and archaeological heritage remains during the operational phase of the development is likely to be highly improbable.

Introduction

H2ON Environmental Consultants requested that the author of this report conduct a Phase 1 Heritage Impact Assessment for the proposed development of a new borrow pit located south of Bloemfontein, near the N6 National Road en route to Reddersburg (**Fig. 1**).

The survey 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 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 which will change the character of a site exceeding 5 000 m2 in extent. A site visit and subsequent assessment took place in January 2013.

Description of the Affected Area

Details of area surveyed

Locality data

1:50 000 scale topographic map: 2926 AA Bloemfontein

1:250 000 scale geological map 2926 Bloemfontein

The 5 ha site is located on pasture land south of the Bloemfontein CBD on the remainder of the farm Sydenham 445/R **(Fig. 2 and 3**). The farm is situated between the N1 and N6 National Roads, next to the Blomanda informal settlement.

Geology

Sedimentary rocks in the region belong to fossil – bearing sandstones, shales and mudstones of the Adelaide Subgroup *Pa* (Beaufort Group, Karoo Supergroup) (**Fig. 4**) Jurassic-age dolerite intrusions, in the form of sills and dykes, occur extensively in the area (*Jd*). Quaternary to recent residual deposits, comprising unconsolidated soils, alluvial sediments and sheet wash deposits, cover the underlying sedimentary rocks and dolerite intrusions. The modern substrate is comprised of light brown to red calcareous soils of varying depth (**Fig. 5**).

Methodology

A pedestrian survey was conducted in the affected area. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera, were used to record

relevant data. Relevant palaeontological and archaeological information were assimilated for the report and integrated with data acquired during the on-site inspection.

Background

Palaeontology

The underlying sedimentary rocks in the region belong to the Beaufort Group of fossil – bearing strata within the Karoo Supergroup. An important feature of the Beaufort Group of rocks is its abundance of Permian-Triassic vertebrate fossil remains, which forms an almost complete record detailing millions of years of vertebrate evolution roughly between 280 and 200 million years ago. The Karoo geological strata within the affected area are generally accepted to be Late Permian in age and are assigned to the *Dicynodon* Assemblage Zone. This biozone is characterized by the presence of a distinctive and fairly common dicynodont genus. Therapsids and other vertebrate fossils from this biozone are are usually found as dispersed and isolated specimens in mudrock horizons, associated with an abundance of calcareous nodules. Plant fossils (*Dadoxylon, Glossopteris*) and trace fossils (arthropod trails, worm burrows) are also present. The sediments assigned to the *Dicynodon* AZ are associated with stream deposits consisting of floodplain mudstones and subordinate, lenticular channel sandstones.

Quaternary-age vertebrate fossils, assigned to the Pleistocene Period, have been recorded from various localities along the Honingspruit, Renosterspruit and Modder River near Bloemfontein and include the extinct species *Equus capensis, Megalotragus priscus, Pelorovis antiquus*, *Antidorcas bondi* and *Equus lylei.*

Archaeology

The Bloemfontein area also bears evidence of inhabitation by Stone Age hunter-gatherers. Surface scatters of Later Stone Age and Middle Stone Age artefacts are frequent archaeological components along erosional gullies of the nearby Modder River and its tributaries. Stone tools are mostly made of hornfels, a dark, fine-grained isotropic rock found in the hot-contact zone between the dolerites and shales in the area. The incidence of surface scatters usually decreases away from localized areas

such as riverine sites and dolerite-shale contact zones. Stone Age artefacts generally occur as contextually derived individual finds in the open veld.

History

The original railway line into Bloemfontein, located to the west of the site, was built in 1890 connecting Bloemfontein to Cape Town. This line proved to be critical to the British in occupying the city later in 1900 during the Anglo Boer War. Another historical site nearby is the Sydenham Leper Hospital, located at the foot of Slypsteenberg about one kilometer northwest of the study area (**Fig. 6**).

Results of Survey

The study area is entirely underlain by an outcrop of igneous dolerite (**Fig 7**). Dolerites are not fossiliferous and can be excluded from further consideration in the present assessment.

Investigation of exposed topsoils show no evidence of Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There is also no evidence for the accumulation and preservation of intact fossil material within the Quaternary sediments (topsoils) covering the underlying sedimentary rocks. No graves or graveyards were recorded. Historical buildings or structures older than 60 years are absent from the site.

Statement of Significance

The area demarcated for development has been suitably recorded, mapped and documented in accordance with the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999).

The impact of the proposed development on palaeontological and archaeological heritage remains is likely to be low. The probability of locating palaeontological and archaeological heritage remains during the operational phase of the development is likely to be highly improbable.

Recommendations

The proposed site is not considered to be palaeontologically and archaeologically sensitive, vulnerable or threatened and can be accessed for development.

References

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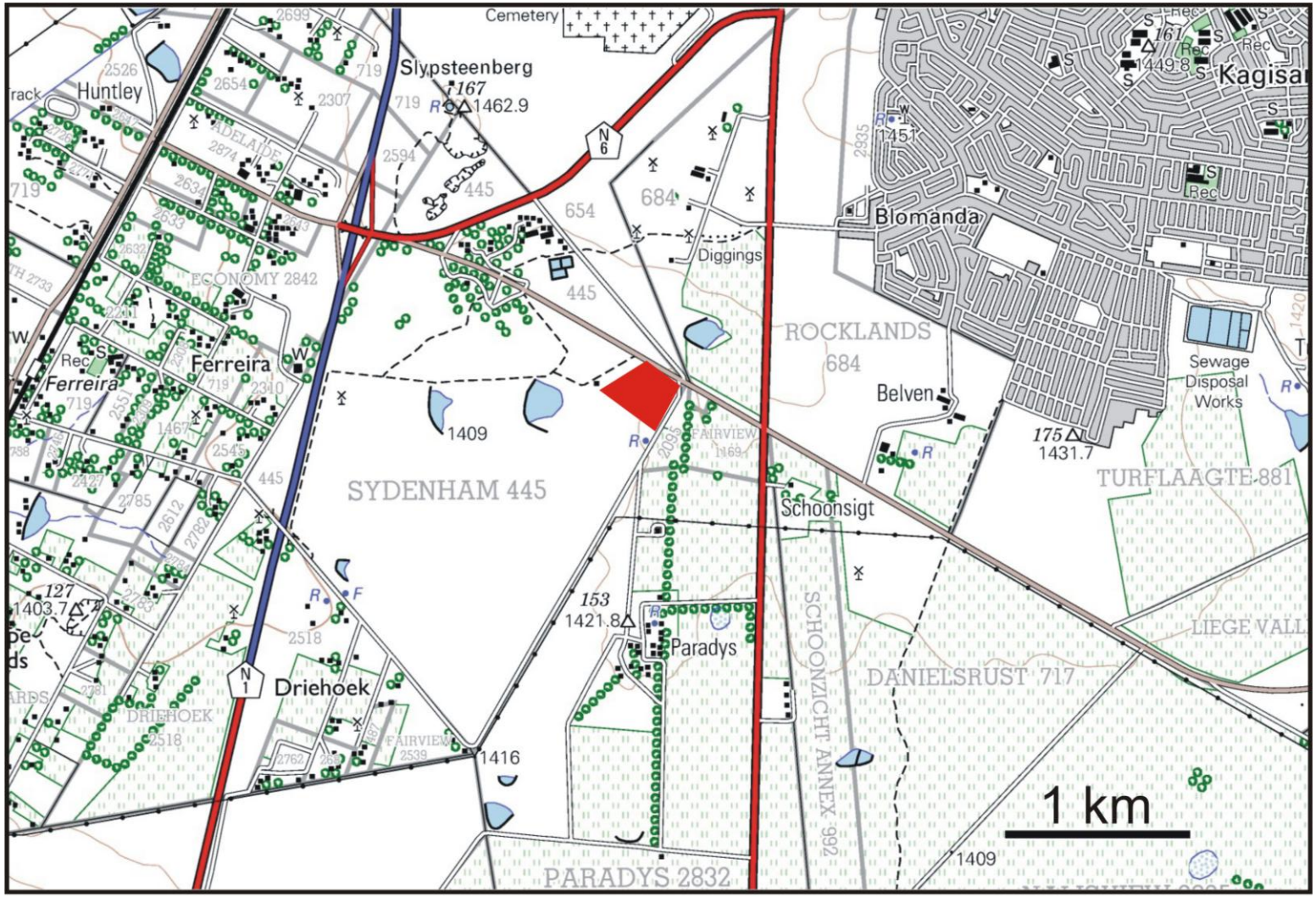

Figure 1. Position of the study area indicated by portion of 1:50 000 scale topographic map 2926 AA Bloemfontein.

Figure 2. Aerial view of the site and the surrounding area.

Figure 3. Panoramic view of the site, looking south. The 5 ha site is located on pasture land south of the Bloemfontein CBD on the remainder of the farm Sydenham 445/R.

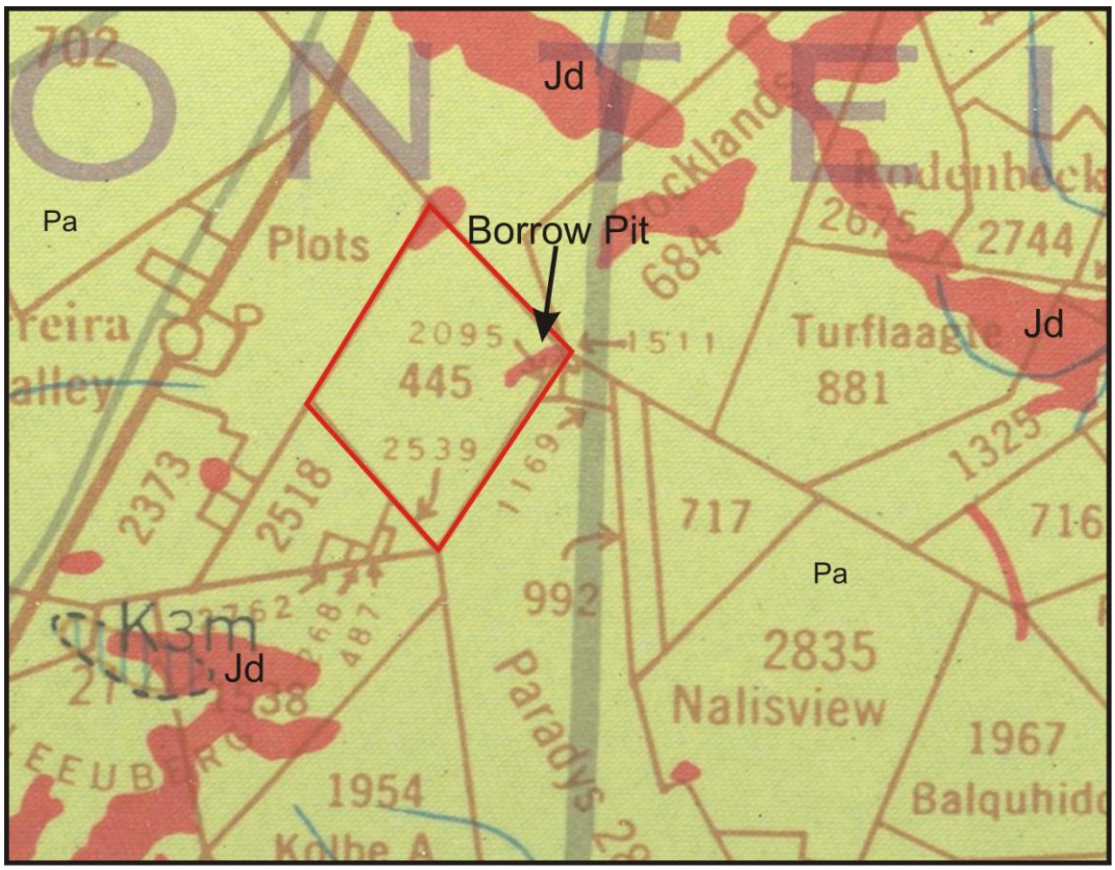

Figure 4. Portion of 1:250 000 scale geological map (2926 Bloemfontein). The borrow pit is located at the northwestern corner of the farm.

Figure 5. Quaternary to recent residual deposits, comprising unconsolidated soils, alluvial sediments and sheet wash deposits, cover the underlying bedrock. The modern substrate is comprised of light brown to red calcareous soils of varying depth.

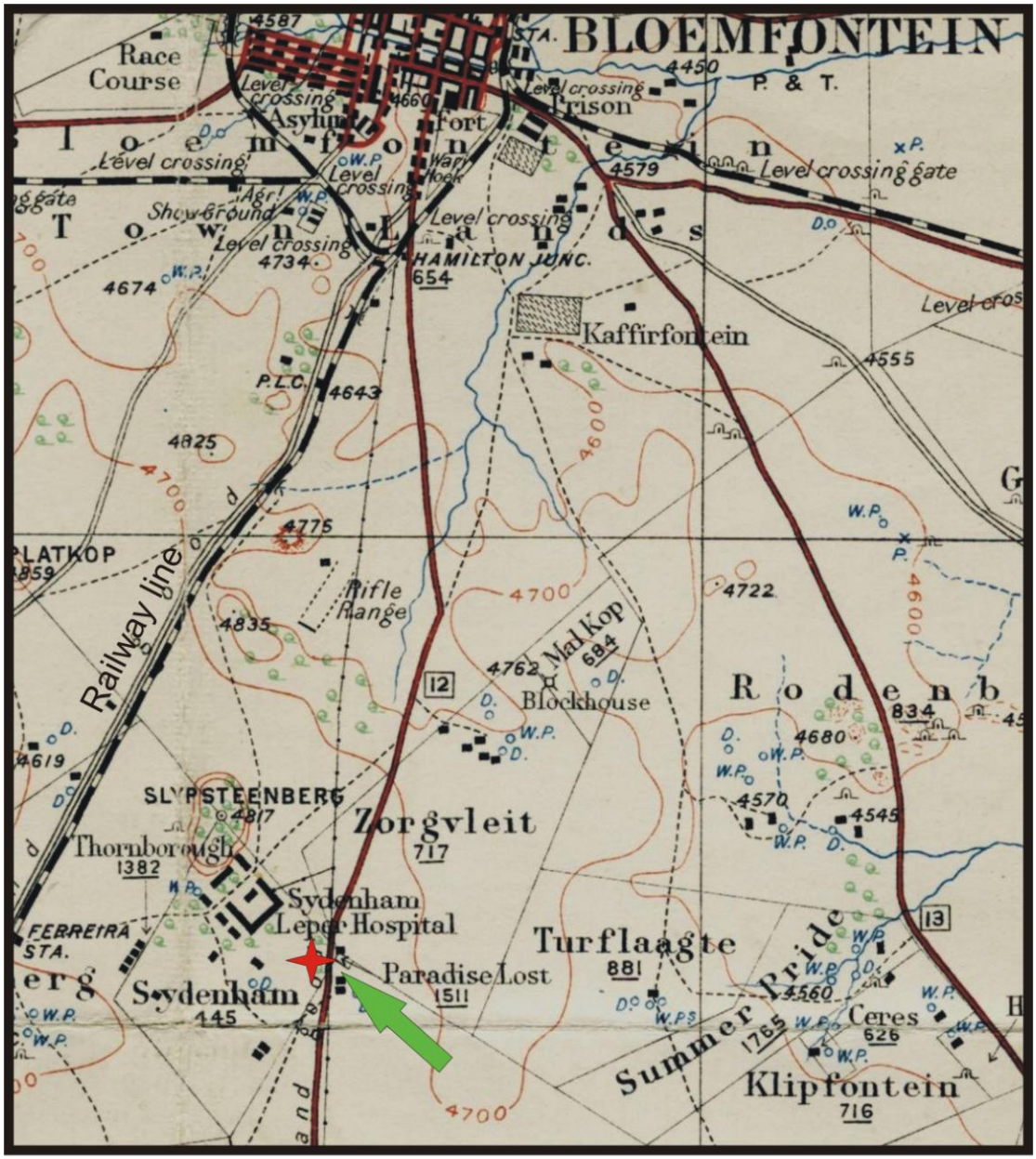

Figure 6. British Military Map of Bloemfontein ca.1913. The study area is indicated by a red star. The railway line that was crucial in transporting British troops during the Anglo Boer War is indicated by a green arrow. The Sydenham Leper Hospital was located at the foot of Slypsteenberg about one kilometer northwest of the proposed site.

Figure 7. The study area is entirely underlain by an outcrop of igneous dolerite (scale = 20 cm).