A preliminary evaluation of archaeological and palaeontological impact with regard to the application for prospecting rights on the farms Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2 in the Warrenton district, Northern Cape region.

Report prepared for

Dera Environmental Consultants (P.O. Box 6499, Flamwood 2572)

by

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Executive Summary

- Diamondiferous alluvial formations of the Vaal River are best developed along the lower sections of the river basin, which include the area around Warrenton.
- Gravel deposits in the region are laterally very extensive and are deposited up to 110 m above the current level of the Vaal River.
- The landscape of the Vaal River basin is archaeologically rich, especially in terms of Stone Age human occupation.
- The sedimentological context of the Vaal River gravels is archaeologically and palaeontologically significant, given the abundant accumulation and preservation of rare mammal fossils and stone tools, dating as far back as the Pliocene and the Pleistocene, respectively.
- Recommendations based on the evaluation are as follows:
    1. A Phase 1 AIA must be executed in each affected area to ascertain potential archaeological impact on the landscape (i.e. open-site surface scatters, settlement structures, rock art), prior to the development of **Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2** for the purpose of diamond mining.
    2. Initial exploration or probing by heavy machinery on the farms **Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2**, for the purpose of diamond mining, must be accompanied by a Phase 1 AIA and PIA in order to assess local subsurface conditions for potential archaeological or palaeontological impact (i.e. capped archaeological material and fossil vertebrate remains).

1 INTRODUCTION

The author of this report was requested by Dera Environmental Consultants (P.O. Box 6499, Flamwood 2572) to carry out a preliminary assessment of potential archaeological impact with regard to the application for prospecting rights on five farms in the Lower Vaal River basin. This required the evaluation of the archaeological and palaeontological significance of the landscape contained by the farms **Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2** in the Warrenton district, Northern Cape region. This evaluation is a desktop study, carried out purely on the basis of personal field data, database information and published literature.

The following is a report on the findings of the assessment.

2 BACKGROUND TO THE LOWER VAAL RIVER AREA

The Vaal River dates back to the late Cretaceous and is one of the principal fluvial conduits in southern Africa. In the Middle to Lower Vaal River Basin the river is flanked by diamondiferous fluvial and rudaceous gravel formations deposited throughout the Cenozoic as a result of factors like cyclic development, climatic change, local tectonics, lithological variations and river capture. The alluvial formations of the Vaal River basin are best developed along the lower 300 km of the river. It has provided good exposures for diamond digging and has gained world acclaim with the discovery of diamonds in the late 1860. Diamond-diggers also recovered rare mammal fossils and stone tools so that at the turn of the 19th century, the Vaal River gravels represented the foremost fossil mammal locality in sub-Saharan Africa.

The following background discussion is a general description of the geology, archaeology and palaeontology of the lower Vaal River area. For the purpose of this report it is the region beween Warrenton and the Vaal's confluence with the Riet River.

Figure 1. 1 : 250 000 topographical map of the areas relevant to the report (2824 Kimberley). A) Doornfontein 12; B) Grasbult 5; C) Schoolplaats 3; D) Schoolplaats Annex 4 and E) Pontdrift 2.

GEOLOGY

Landscape topography in the lower Vaal River area consists largely of coalescent planar surfaces resting on a pre-Karoo platform of Ventersdorp basalts and andesites of the Allanridge Formation. Gravel deposits are laterally very extensive and are deposited up to 110 m above the current riverbed of the Vaal River. These alluvial deposits, manifested as terrace exposures in the Lower Vaal River Basin, including the Warrenton area, are subdivided into Older and Younger gravels on the basis of lithological and topographical observations. It consists of grit to cobble grade conglomerate with granular to pebbly clasts that are composed mainly of quartz, quartzite, agate, chert or banded ironstone set in a matrix of dark red, fine to medium sand. The gravels are spread across a pre-Karoo platform of Ventersdorp lava pockmarked with thin remnants of Karoo sediments preserved in depressions.

The oldest gravels occur between 75m and 100m above the present river level while the next group of more calcified older gravels occur at 60m – 21m levels. The younger gravels form the 8m to 15m - floodplain terrace above present river level and contain a sequence of alluvial deposits ranging in age from the Middle Pleistocene right up to the Late Pleistocene and Holocene on the basis of palaeontological and archaeological evidence.

PALAEONTOLOGY

No fossils have been explicitly reported from the Older Gravels, but more ancient forms of uncertain provenance have been retrieved together with the extensive fossil fauna of the Younger Gravels. Gravel terraces between 21m and 30m above present river level, contain frequent sandy lenses and have yielded vertebrate fauna such as the extinct probiscidian, *Mammuthus subplanifrons* that are estimated to be ranging in age from 4.5 to 3.5 million years old. Other fossil remains include extinct suids and more proboscidian taxa, notably *Notochoerus capensis,* and *Elephas iolensis.*

ARCHAEOLOGY

The lower Vaal River basin is generally rich in archaeological heritage, especially in terms of Stone Age human occupation on the landscape. In

terms of the fluvially deposited river gravels, archaeological finds are exclusively derived from the Younger Gravels and include an abundance of Acheulian (Early Stone Age) handaxes, cleavers and core-axes, primarily made from quartzite. In addition, the gravel deposits are largely mantled by Hutton Sands, of which the lower levels have shown evidence of high densities of Fauresmith blades, which is regarded as an important transitional stone tool industry at the beginning of the Middle Stone Age. The incidence of Later Stone Age artifacts as open-site scatters is also common on the modern landscape.

ROCK ART

There are plentiful rock art sites with petroglyphs in the Lower Vaal River Basin including the area around Warrenton. Rock engravings have been recorded at Four Streams, Nazareth and Schoolplaats that include human figures, animals, therianthropes and geometric motifs (Figure 1).

3 BRIEF ASSESSMENT OF THE FARMS DESIGNATED FOR DEVELOPMENT

Doornfontein 12

Doornfontein lies immediately southwest of Warrenton on the western bank of the Vaal River (Figure 1A & 2). South of Doornfontein, the river has entrenched itself deeply in Ventersdorp lava bedrock all the way towards Windsorton and the younger gravels are hardly ever found. There are presently no data available regarding archaeological or palaeontological discoveries at Doornfontein.

Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2

Extensive gravel terraces occur east of Warrenton between Grasbult, Schloolplaats, Schoolplaats Annex and Pontdrift (Figure 1 & 3). Dolerite sills are widespread on Schoolplaats where they form the top of a plateau 20 m above the current river level. The junction between dolerite outcrop and Dwyka shales is also evident in gullies near the Pontdrift-Driehoek boundary.

A large portion of the river floodplain at Grasbult, Schoolplaats, Schoolplaats Annex and Pontdrift are composed of bands of silt, sands and clay that has been partly covered by aeolian sands. A pebbly gravel layer, containing Middle Stone Age flakes, has been recorded at the base of the fluvial sand deposits at Schoolplaats and Schoolplaats Annex 4. There are also 544 rock engraving recorded on Schoolplaats. Apart from above, no archaeological artifacts or vertebrate fossil remains have been explicitly reported from the gravel deposits or younger overburdens on Schoolplaats, Schoolplaats Annex 4 or Grasbult 5 and Pontdrift 2. Several Early Stone Age handaxes have been found on Cawoods Hope in exposures in the riverbed showing moderately coarse gravel layers capped by silt and clayey deposits. Calcarous tufa is also found on exposed Dwyka beds and Ventersdorp bedrock, especially at Cawoods Hope, Catharina, and Onrust (Figure 1 & 3). Later Stone Age artifacts occur on these deposits at various places.

4 CONCLUSIONS AND RECOMMENDATIONS

There are presently no data available regarding archaeological or palaeontological discoveries at Doornfontein. There are rock engravings on Schoolplaats, and a pebbly gravel layer, containing Middle Stone Age flakes, has been recorded at the base of fluvial sandy deposits at Schoolplaats and Schoolplaats Annex 4. No other archaeological artifacts or vertebrate fossil remains have been explicitly reported from the gravel deposits or younger overburdens at Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2. Nevertheless the alluvial gravels contained on the above farms must be regarded as potentially fossiliferous and archaeologically sensitive until appropriate archaeological impact assessments have been conducted.

Recommendations based on this scoping report are as follows:

1. A Phase 1 AIA must be executed in each affected area to ascertain potential archaeological impact on the landscape (i.e. open-site surface

scatters, settlement structures, rock art), prior to the development of **Doornfontein 12, Grasbult 5, Schloolplaats 3, Schoolplaats Annex 4 and Pontdrift 2** for the purpose of diamond mining.

2. Initial exploration or probing by heavy machinery of the affected areas, for the purpose of diamond mining, must be accompanied by a Phase 1 AIA and PIA in order to assess local subsurface conditions for potential archaeological or palaeontological impact (i.e. capped archaeological material and fossil vertebrate remains).

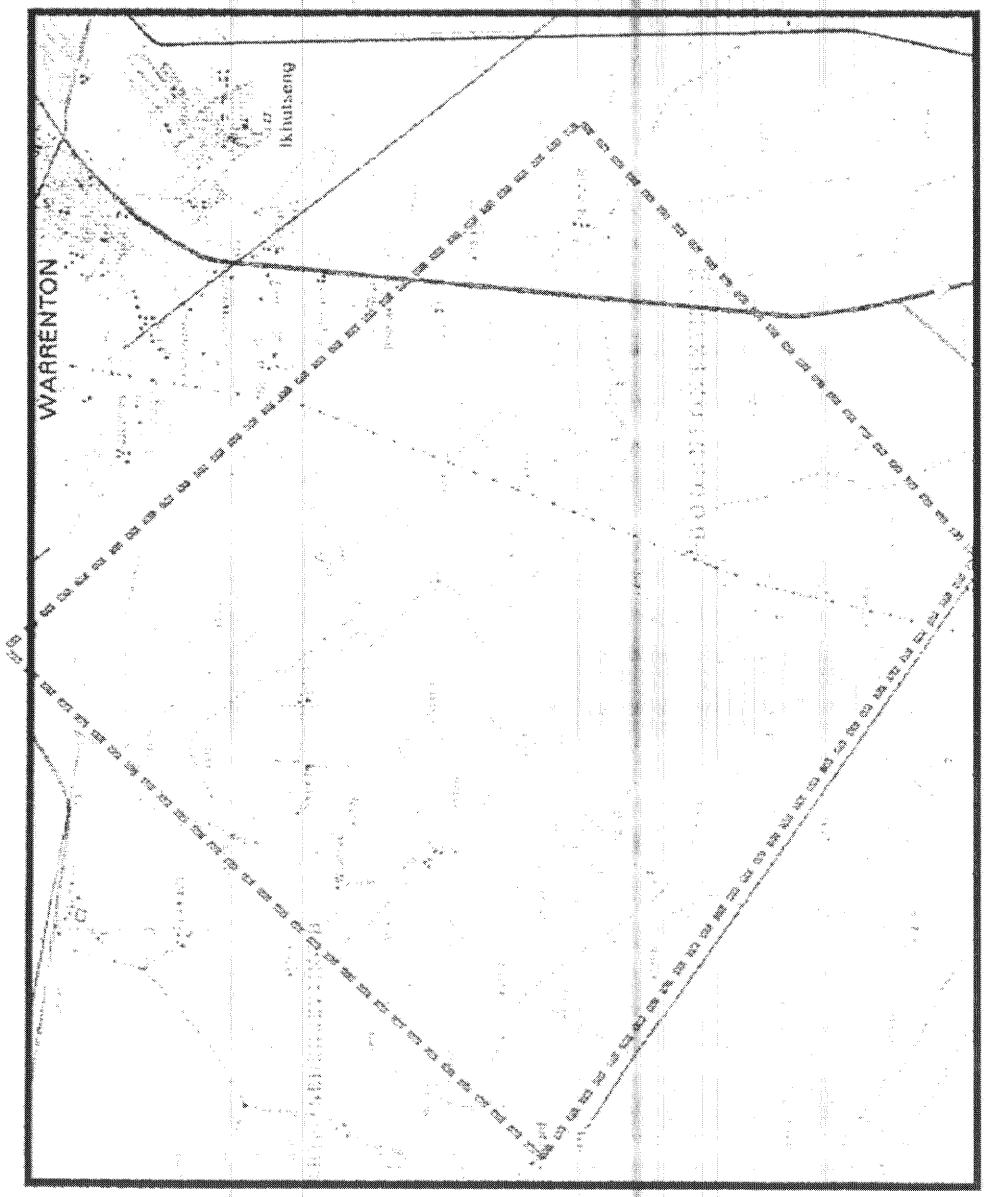

Figure 2. 1 : 50 000 topographical map of the farm Doornfontein 12, shown in red (2824BB Warrenton).

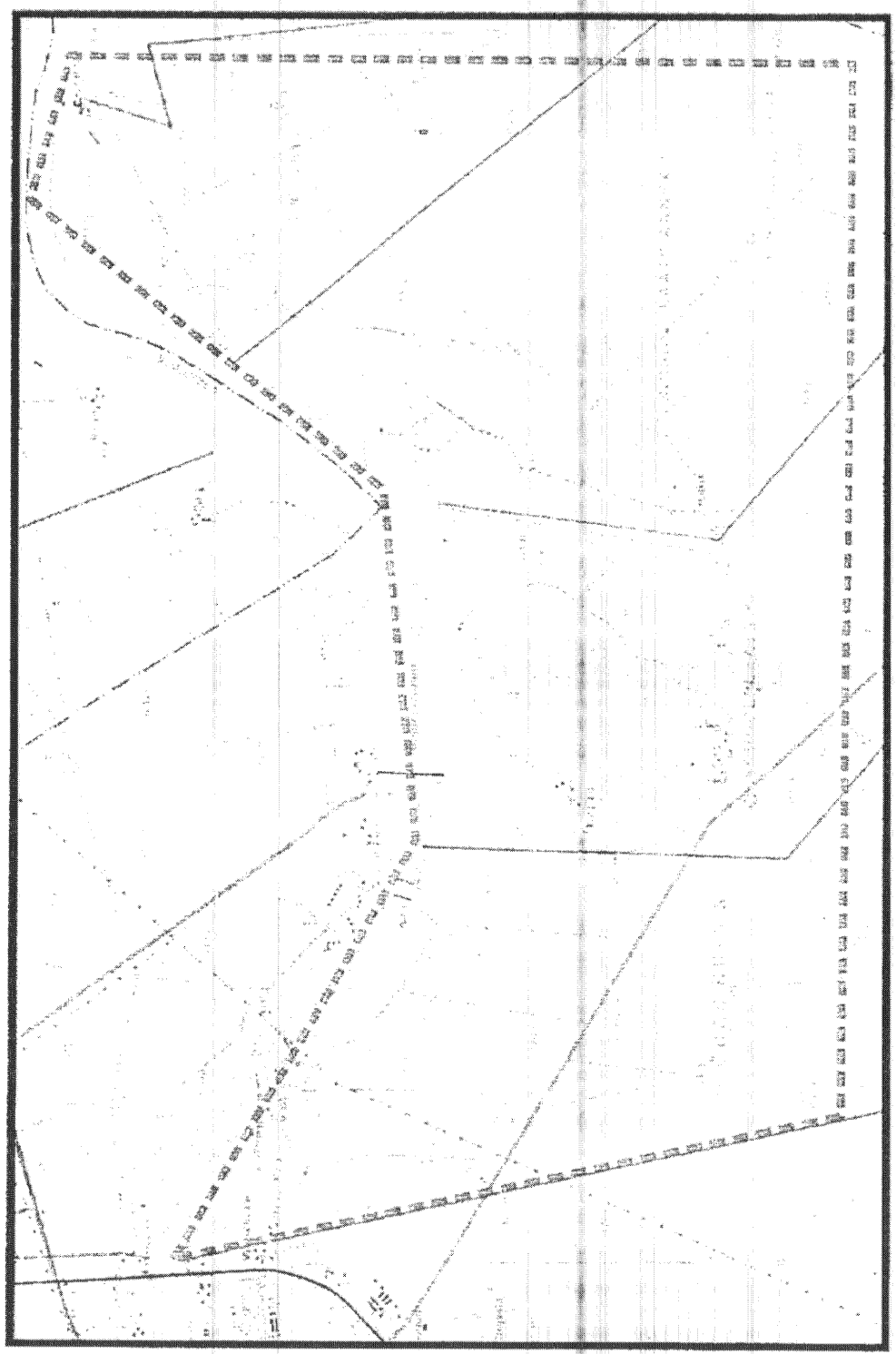

Figure 3. 1 : 50 000 topographical map of the farms Grasbult 5, Schoolplaats 3, Schoolplaats Annex 4 and Pontdrift, shown in red (2824BB Warrenton).

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