APPENDIX D_1

Heritage Report

Phase 1 Heritage Impact Assessment of three proposed pipeline alternatives along Roodewal Midway Road between the Renosterspruit and Blesbok Avenue, Bloemfontein, Free State Province.

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Summary

A Phase 1 Heritage Impact Assessment was carried out for three proposed water pipeline alternatives along Roodewal Midway Road between the Renosterspruit and Blesbok Avenue in Bloemfontein, Free State Province. The proposed pipeline will function as transport for treated water to the purification plant at the Maselspoort Dam and from there back to Bloemfontein for re-use. As far as the palaeontological heritage is concerned, likelihood of palaeontological impact resulting from these linear developments is considered low for each of the three alternative routes as a result of the low topography terrain and presence of a well-developed, superficial overburden. Development for any of the three alternatives can proceed provided that all excavation activities are solely restricted to the current layout. However, any excavation exceeding depths of >1m into freshly exposed sedimentary strata (Adelaide Subgroup bedrock sediments) will require brief monitoring by a qualified palaeontologist so that any chance fossil finds can be retrieved and reported to SAHRA for further verification and mitigation. As far as the archaeological heritage is concerned, the proposed development is considered to be of low archaeological significance and is assigned a site rating of Generally Protected C. Development for any of the three alternatives can proceed with no further archaeological assessments required.

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Introduction

A Phase 1 Heritage Impact Assessment was carried out for three proposed water pipeline alternatives along Roodewal Midway Road between the Renosterspruit and Blesbok Avenue in Bloemfontein, Free State Province (**Fig. 1**). The proposed pipeline will function as transport for treated water to the purification plant at the Maselspoort Dam and from there back to Bloemfontein for re-use. The region's unique and non-renewable archaeological and palaeontological 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 including archaeological and palaeontological sites in the area to be developed, and that make recommendations for protection or mitigation of the impact of the sites.

The primary legal trigger for identifying when heritage specialist involvement is required in the Environmental Impact Assessment process is the National Heritage Resources (NHR) Act (Act No 25 of 1999). The NHR Act requires that all heritage resources, that is, all places or objects of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance are protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures over 60 years of age, living heritage and the collection of oral histories, historical settlements, landscapes, geological sites, palaeontological sites and objects. The Act 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 of development listed in Section 38 (1) of the NHR Act are:

- 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).

If a heritage resource is likely to be impacted by a development listed in Section 38 (1) of the NHR Act a heritage assessment will be required either as a separate HIA or as the heritage specialist component (AIA or PIA) of an EIA.

A range of contexts can be identified which typically have high or potential cultural significance and which would require some form of heritage specialist involvement. In many cases, the nature and degree of heritage significance is largely unknown pending further investigation (e.g. capped sites, assemblages or subsurface fossil remains). On the other hand, it is also possible that a site may contain heritage resources (e.g. structures older than 60 years), with little or no conservation value.

Methodology

The archaeological 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 archaeological information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection.

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.

Field Rating

Site significance classification standards as prescribed by SAHRA (2005) for archaeological sites were used for the purpose of this report (**Table 1**).

Locality data

1 : 50 000 scale topographic map: 2926 AB Maselspoort

1 : 250 000 scale geological map 2924 Bloemfontein

Alternative 1 and 2 follows the same route (red, **Fig. 2**) except for a 1.2 km diverging section indicated for Alternative 2 (green, **Fig. 2**). Alternative 3 (blue, **Fig. 2**) runs further east, but parallel to Alternative 1. The proposed routes traverse parts of the Riverside and Roodewal Small Holdings, situated east of the Renosterspruit on the Maselspoort road outside Bloemfontein (**Fig. 3**).

Routes Impact Area Coordinates:

Northwestern boundary: 29° 5'44.80"S 26°19'53.82"E

Northeastern boundary: 29° 4'20.12"S 26°21'58.73"E

Southeastern boundary: 29° 4'36.44"S 26°22'13.42"E

Southwestern boundary: 29° 5'56.19"S 26°20'13.85"E

Background

According to the 1 : 250 000 scale geological map 2924 Bloemfontein, the study area is situated within the Beaufort Group, Adelaide Subgroup (Karoo Supergroup), which is primarily represented by late Permian sedimentary rocks, made up of alternating sandstone and mudstone layers (*Pa*) associated with stream and floodplain deposits (Theron 1963; Johnson *et al.* 2006) (**Fig. 4**). Jurassic-age dolerite intrusions, in the form of sills and dykes, occur extensively around the area (*Jd*). Quaternary to recent residual deposits, comprising unconsolidated soils, alluvial sediments and sheet wash deposits, cover the underlying sedimentary rocks. The sedimentary rocks are generally accepted to be Late Permian in age and are assigned to the *Dicynodon* Assemblage Zone (Kitching 1995). The *Dicynodon* AZ is characterized by the co-occurence of two therapsids, *Dicynodon* and *Theriognathus* as well as a diversity of less dominant vertebrate taxa, while trace fossils of invertebrates and vertebrates as well as *Glossopteris* flora plants have also been described (**Fig. 5**).

The Stone Age archaeological record of the Bloemfontein region spans back to the Middle Stone Age. Prehistoric archaeological remains previously recorded in the

region include numerous occurrences of *in situ* Middle and Later Stone Age artefacts eroding out of the overbank sediments associated with the Modder River and its tributaries where they are often found in association large mammal fossil remains (Broom 1909; Churchill *et al*. 2000; Rossouw 1999, 2000, 2006). The study area is located outside the south-western periphery of distribution of Late Iron Age stone-walled settlements in the Free State (Maggs 1976).

Field Assessment

The pipeline footprint is characterized by flat, open and mostly degraded terrain (**Fig. 6 – 9)**. Except for palaeontologically insignificant dolerite exposed near the southeastern boundary of the footprint area (**Fig. 10**), no potentially sensitive Adelaide Subgroup outcrop was observed along the routes. A foot survey of the terrain revealed no evidence for the accumulation and preservation of intact fossil material within the superficial Quaternary sediments and especially within the well-developed alluvial deposits exposed along the Renosterspruit. As a result, outcrop visibility is also generally poor along the footprint. The survey revealed no evidence of *in situ* Stone Age archaeological material, capped or distributed as surface scatters on the landscape. There are also no indications of rock art (e.g. engravings on dolerite outcrop), prehistoric structures, Anglo Boer War sites, graves or buildings with historical significance older than 60 years within the boundaries of the three alternatives.

Impact Statement and Recommendation

The development footprint is underlain by potentially fossil-bearing sedimentary strata of the Late Permian Adelaide that are buffered by well-developed superficial deposits of low to very low palaeontological sensitivity.

As far as the palaeontological heritage is concerned, likelihood of palaeontological impact resulting from these linear developments is considered low for each of the three alternative routes as a result of the low topography terrain and presence of a well-developed, superficial overburden. Development for any of the three alternatives can proceed provided that all excavation activities are solely restricted to the current layout. However, any excavation exceeding depths of >1m into freshly exposed sedimentary strata (bedrock) will require brief monitoring by a qualified palaeontologist so that any chance fossil finds can be retrieved and reported to SAHRA for further verification and mitigation.

As far as the archaeological heritage is concerned, the proposed development is considered to be of low archaeological significance and is assigned a site rating of Generally Protected C. Development for any of the three alternatives can proceed with no further archaeological assessments required.

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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.

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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