

# HERITAGE IMPACT ASSESSMENT

submitted in terms of section 38(8) of the National Heritage Resources Act

prepared for

**NADESON Consulting Services**

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DR 01725 Central Karoo

Clanwillian – Central Karoo District Municipality, Western Cape

## Executive summary

Nadeson Consulting Services appointed *vidamemoria* to conduct a heritage impact assessment for a existing borrow pit located along DR 01725 on the outskirts of Prince Albert in the Central Karoo District Municipality, Western Cape. *vidamemoria* appointed Dr John Almond (Natura Viva CC) to conduct necessary palaeontological specialist study and Madelon Tusenius (Natura Viva CC) to conduct necessary archaeological impact assessment. Heritage impact assessment is submitted for comment in terms of Section 38(8) of the NHRAct as a component of an Environmental Management Programme (EMProg in terms of Mineral and Petroleum Resources Development Act 49 of 2008) to be submitted to the Department of Mineral Resources (DMR).

Existing borrow pit is excavated into Early Permian sediments of the lower Ecca Group and the unusually well-exposed bedding planes of this succession seen along the northern edge of the existing quarry display very dense but low diversity assemblages of trace fossils. Artefacts in the northern part are closely associated with the presence of the chert band of the Matjiesfontein Member and it is recommended that mitigation consisting of the targeted surface sampling of the area of densest artefact concentration be undertaken. The southern part of the site is considered to be of low significance and no further archaeological studies or mitigation are recommended in this part of the proposed extension.

## 1. Introduction

Nadeson Consulting Services on behalf of the WCPA: Department of Transport and Public Works appointed Quahnita Samie (*vidamemoria*) to conduct a Notification of Intent to Develop (NID) application in terms of Section 38(1) of the National Heritage Resources Act (Act 25 of 1999) for a proposed borrow pit at km 0.6 along DR 2182 near Prince Albert, in the Central Karoo District Municipality. NID dated 26 April 2012 was submitted to Heritage Western Cape (HWC) for consideration. Response dated 16 May 2012 (case ref 120502JL02) requested 'a heritage impact assessment limited to archaeological scoping report and a palaeontological scoping report with an integrated set of recommendations is required' (Refer Annexure A). *vidamemoria* appointed Dr John Almond (Natura Viva CC) to conduct the necessary palaeontological specialist study (dated March 2013) and Madelon Tusenius (Natura Viva CC) to conduct necessary archaeological impact assessment (dated March 2013) under supervision of Dr Lita Webley (ACO Associates) as incorporated within this assessment.

The proposed action triggers Section 38(1) (c)(a) activity that will change the character of a site exceeding 5 000 m<sup>2</sup>. This assessment report is submitted for comment in terms of Section 38(8) of the NHRAct as a component of an Environmental Management Programme (EMProg) in terms of the Mineral and Petroleum Resources Development Act (49 of 2008) to be submitted to the Department of Mineral Resources (DMR). Notification as previously submitted to HWC (dated 31 May 2011) and response (dated 20 June 2011) confirmed the approach to be undertaken in submitting borrow pit notifications to HWC.

### Structure of assessment

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### Site location and description

Existing pit DR01725/0.6/0.02R is situated on the Prince Albert Townlands on the southern edge of North End township approximately 500 m west of Prince Albert. The site is owned by the Prince Albert Municipality. Borrow pit co-ordinates are 33° 12' 48.3" S, 22° 01' 25.0" E Existing worked borrow pit on outskirts of Prince Albert is located on a ridge with irregular working faces, steep and cut on near vertical planes. To date has resulted in formation of irregular hollows parts of which collect run off water. Existing pits is not fenced and can be accessed from existing roads and tracks with waste and dumping taking place on central portions of pit. Surrounding context is open space with vegetation characterised by sparse Karoo shrubs and grasses. Borrow pit lies adjacent to a residential development on outskirts of Prince Albert.

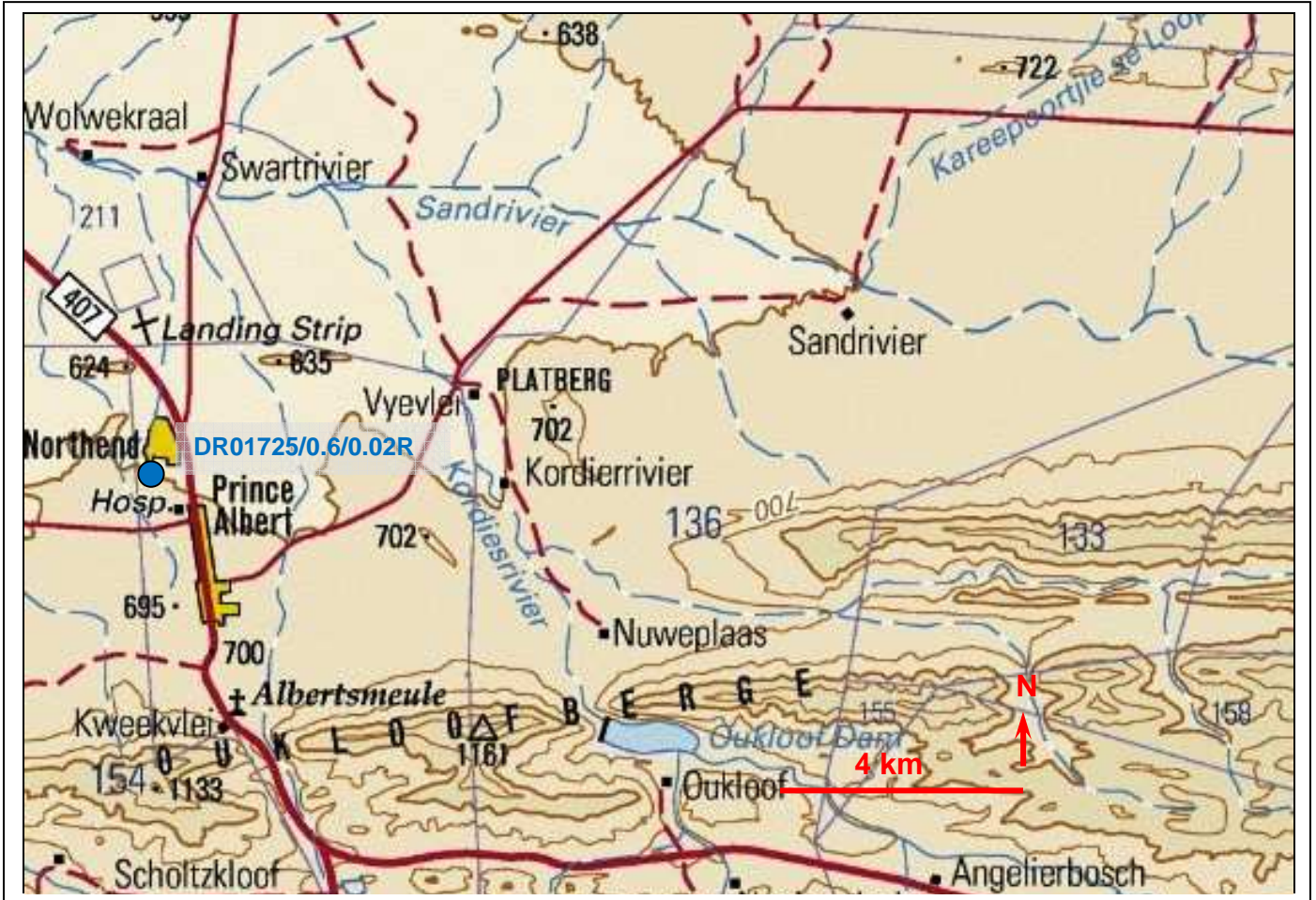


Figure 1: Extract from topographical sheet 3322 Oudtshoorn (extracted Almond 2012: 2)

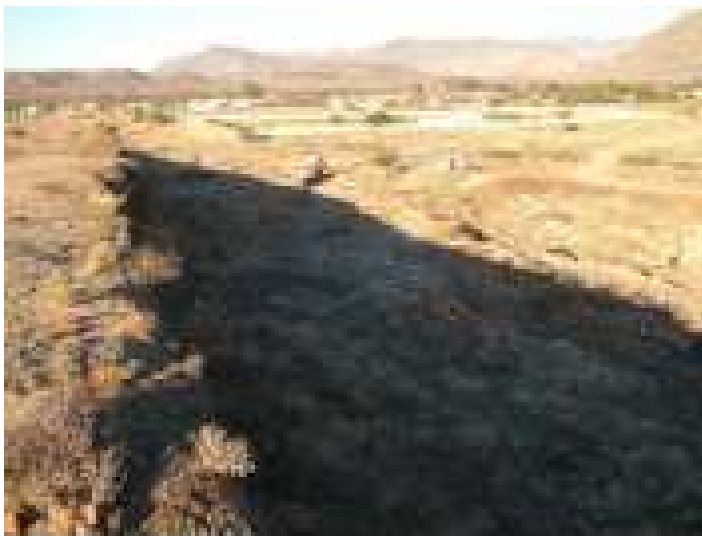


Figure 2: General view of south-eastern portion from crest of ridge



Figure 3: General view of south-western portion from crest of ridge



## Description of proposals

In terms of the Minerals and Petroleum Resources Development Act, all mining activities including extraction of material from borrow pits and quarries requires authorisation from the Department of Mineral Resources (DMR). Where the WCPA: Dept Transport and Public Works is undertaking the maintenance and / or upgrading of roads under its control, no application needs to be submitted for a mining right or permit, however, as per provisions of Section 106(2) of the MPRDAct, they are required to prepare and submit an EMProg to DMR for their approval prior to the extraction of any material from a proposed borrow pit or quarry. According to the MPRDAct, mineral resources are in the custodianship of the State, where WCPA would temporarily acquire the right to mine the borrow pits, subject to approval by the DMR.

For a gravel road to be able to carry traffic safely and effectively an upper layer of gravel known as a wearing course, which meets specific technical requirements, has to be placed on the prepared roadbed. With time, the wearing course is eroded away by both traffic and the elements. This wearing course needs to be replaced in order to continue to deliver a safe and functional surface to road users. Implementation of regravelling activities requires extraction of suitable materials from identified material sources. During decommissioning, working areas are rehabilitated and revegetated. Material excavated from borrow pit located at **km 0.6 along DR 01725** will be used for the re-gravelling so as to benefit road users in terms of road safety and user economy as well as to minimise maintenance-related disruptions.

Summary of borrow pit	
Borrow pit / expropriation area	60 000 m <sup>2</sup>
Maximum depth	4 m
Material description	Dwyka Shale
Proposed usage after rehabilitation	Revegetation
Volume of material to be sourced	67 260 m <sup>3</sup>
Estimated proven material reserves	124 700 m <sup>3</sup>

Trial pit investigations and sampling were conducted at four proposed borrow pits considered as potential sources of material. Three were however excluded from consideration due to environmental concerns and / or unsuitability of material for purpose of regravelling.

The mine plan outlining extent of borrow pit and mining is attached as Annexure B. Methodology for the preparation, operation and closure of borrow pit is outlined in Annexure C.

Central Karoo District Municipality is to undertake work on behalf of the WCPA. Formal agreements are to be entered into between the landowner and the WCPA, with the municipality managing the site until decommissioning and closure. During decommissioning, the working area will be rehabilitated and revegetated as per the approach outlined in the mining plan. WCPA's liability for the site persists until such time as a Closure Certificate has been issued by the DMR.

## **Results of consultation**

DMR has outlined requirements for public participation in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002) for exempted organs of state. This includes liaison with the landowner, notification of the immediate neighbours and either an on-site advertisement or advertisement in the local newspaper. The WCPA has indicated a commitment to developing and maintaining good relations with landowners and therefore landowners concerns are incorporated into the final agreement.

The public consultation process for this project has involved consultation with the landowners and neighbours, and the advertising of the proposed activity in the local newspaper.

No heritage related comments and / or concerns were received.

### *Requests / concerns of owner:*

Before material is excavated from this pit (and its proposed extensions), a letter outlining procedures for mining wearing course gravel must be presented by the Provincial authorities to the Municipal authorities for consideration by the Town Council.

## 2. Heritage resources

### Identification of heritage resources

Proposed site and immediate context do not fall within conservation or protected heritage areas, and is not located near to or visible from any protected heritage sites. The site does not fall within a historical settlement or townscape and does not contribute towards rural or natural landscape of cultural significance. The site is therefore not considered as an integral component of the cultural landscape.

Dr John Almond conducted a palaeontological field assessment and provided a report outlining geological context, palaeontological heritage and palaeontological sensitivity. Existing borrow pit is excavated into Early Permian sediments of the lower Ecca Group which have yielded important assemblages of fossil fish, marine shelly invertebrates, mesosaurid reptiles, non-marine crustaceans, petrified wood and trace fossils in the Prince Albert area and elsewhere along the margins of the Main Karoo Basin. Large fragments of petrified driftwood have been recorded from the study area, probably from the Collingham Formation. The unusually well-exposed bedding planes of this succession seen along the northern edge of the existing quarry display very dense but low diversity assemblages of trace fossils (invertebrate burrows). For the most part, the Lower Ecca rocks have been high deformed by tectonism (folding, cleavage formation) and are often highly weathered and fractured. No body fossils were observed in the Ecca Group during field assessment (Almond 2013: 13).

Madelon Tusenius conducted archaeological field assessment and provided report identifying and assessing archaeological resources, associated impact, assessment of significance and recommendations regarding any mitigation required. Numerous Middle and Later Stone Age artefacts were scattered in varying densities over most of the northern part of the affected area and a few scattered artefacts were observed in the southern part, as well as beyond the western extent of the polygon. Those in the northern part are closely associated with the presence of the chert band of the Matjiesfontein Member. There are signs of flaking on portions of the chert band and on chert blocks of varying sizes which lie scattered over the terrain. It does not seem that any formal studies of archaeological material found in association with the chert band of the Matjiesfontein Member have been done, although it must be one of the most important sources of suitable raw material for the manufacture of artefacts in the south and south-western margins of the Great Karoo. Although the material in the northern part of the affected area is chronologically mixed and is not in a stratified context, it can provide information on the types and frequencies of artefacts produced by the knapping of chert in this area (Tusenius 2013: 11)

### Heritage significance

With the exception of the well-developed trace fossil assemblages in the Collingham Formation, the overall palaeontological sensitivity of the site is low. The overlying colluvial and alluvial gravels are not palaeontologically sensitive (Almond 2013: 13). Information on local stone tool technology is of scientific value and this probable factory site is therefore considered to be of medium to high significance. Southern part of the site is considered to be of low archaeological significance (Tusenius 2013: 11)

### Heritage indicators

Heritage indicators identified aim to ensure that significance would not be adversely impacted on by the proposed development. Indicators concern impact on the cultural landscape, identified heritage resources and visual impact. No sensitive landscapes and material of archaeological significance were identified. The site is however regarded to be of exceptionally high palaeontological sensitivity.

### 3. Assessment of impacts

An assessment of the potential development impacts on significance is undertaken using relevant assessment criteria as well as response to indicators. Assessment of impacts on palaeontological significance has been provided as well as consideration of the cultural landscape and assessment of cumulative impacts.

**Cultural landscape:** Proposed borrow pit would not result in a negative impact on the cultural landscape. The landscape within which the site lies possesses low intrinsic heritage value and no heritage resources were identified within the immediate context. The site and its immediate context are considered as being of low heritage significance. No heritage resources will be impacted and the overall status of the impact is considered as low.

**Archaeological and palaeontological impact:** recommended that the trace fossil assemblages currently exposed in the Collingham Formation along the northern edge of the existing pit be recorded and judiciously sampled by a professional palaeontologist *before* further excavation takes place. Recommended that targeted surface sampling of the area of densest artefact concentration be undertaken by a qualified archaeologist

**Visual impact:** Low intensity visual impact is limited to the immediate surroundings and will be limited to operational phase.

**Cumulative impact:** The proposed moderate intensity intervention lies within a disturbed context with degraded conditions. No new roads would have to be constructed as the borrow pit is accessed directly off main / divisional roads or via existing access tracks. The borrow pit and access tracks would be fenced for the duration of the mining activities. There will be no site buildings located at the borrow pit site. No long-term traffic increase will be experienced. Low impact is associated with impact of increased personnel and cumulative impacts on borrow pit footprint and surroundings.

**Site rehabilitation:** Topsoil from newly developed areas should be stockpiled for later redistribution over all the worked out area, preferably in stages as the working area advances into un-mined group

**Impact relative to sustainable social and economic benefits:** The project will result in social and economic benefits for the local community in terms of service provision and employment opportunities.



## 4. Discussion

During the course of borrow pit excavations, operations should be planned in such a way that the amount of work that will be necessary for the finishing off of the borrow pit is reduced as far as possible. Indiscriminate excavation without due regard for the desired final shape of the borrow pit should not be permitted and should be rectified immediately. Timing of rehabilitation is important as rehabilitation of disturbed areas should ideally be programmed to occur as soon as practically possible following cessation of work in a specific area. The period between cessation of activities associated with mining of materials and the onset of rehabilitation for that area should ideally not exceed 1 month. Rehabilitation operations should ideally be conducted in parallel with extraction. Accordingly, progressive rehabilitation, in which depleted sections of a borrow pit are reclaimed while extraction is ongoing in other sections of the same pit is encouraged.

Site development, operation, mining and closure guidelines outlined with the Environmental Management Programme provides detailed guidance for the preparation, operation and decommissioning of the site. Rehabilitation of old and current working faces has been undertaken to mitigate visual impact to road users. Measures outlined should be adhered to in order to minimise potential negative impacts. It is recommended within the EMProg that an environmental control officer or suitable experienced engineer monitors the preparation, operational and decommissioning of the borrow pit so as to ensure that mitigation and rehabilitation measures are adhered to.

It is recommended that the trace fossil assemblages currently exposed in the Collingham Formation along the northern edge of the existing pit should be recorded and judiciously sampled by a professional palaeontologist *before* further excavation takes place. There are no objections on palaeontological heritage grounds to the proposed borrow pit extension (Almond 2013: 13).

A cautionary approach would be to conserve the northern area of the borrow pit. However, should the proposed extension be approved, it is recommended that mitigation be undertaken before any further quarrying activities be permitted. The archaeological material should be mapped, sampled and described before a permit for the destruction of the site is issued. Such mitigation should involve targeted sampling of the area of densest artefact distribution. As it is unlikely that there is any depth to the artefact distribution, surface collecting rather than the excavation of material should be sufficient to obtain a representative sample. The southern part of the site is considered to be of low archaeological significance and no further archaeological studies or mitigation are recommended in this part of the proposed extension. If any human remains are found during the development of the proposed pits, work in that area must cease and the South African Heritage Resources Agency (SAHRA) must be notified immediately (Tusenius 2013: 11).

### Recommendations

It is therefore recommended that:

1. expansion of existing borrow pit be supported
2. recommended that the trace fossil assemblages currently exposed in the Collingham Formation along the northern edge of the existing pit be recorded and judiciously sampled by a professional palaeontologist *before* further excavation takes place
3. recommended that targeted surface sampling of the area of densest artefact concentration be undertaken by a qualified archaeologist in the northern portion of the borrow pit area as outlined by the archaeologist
4. comment be issued that proposed activity may proceed in terms of Section 38(8) of the NHRAct

References:

- Almond John E PhD (March 2013): *Palaeontological specialist study: field assessment & recommendation for exemption from further studies & mitigation*
- ASAPA Aggregate and Sand Producers Association of Southern Africa (30 September 2009): *The issue of borrow pits being used in the aggregate and sand industry* accessed online
- Aurecon / Nadeson JV (July 2011): *Draft environmental management programme, summary report and mine plan*
- Galliers R M (July 2011): *Geotechnical investigations and geological strategic gravel pit summary report* for Aurecon South Africa
- Heritage Western Cape (May 2012): *Minimum Standards For Phase 1 Archaeological Impact Assessment (Aia) Reports*
- Tusenius M (March 2013): *Archaeological Impact Assessment*
- vidamemoria (April 2012): *Notification of Intent to Develop*