

# McGregor Museum

## Department of Archaeology



### **Heritage Impact Assessment for proposed drilling site at Ferny Hoek Flat 108, west of Kimberley, Northern Cape**

David Morris  
September 2020

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## **Executive Summary**

A Phase 1 Heritage Impact Assessment is presented.

Precise co-ordinates for one proposed drilling site was presented and De Beers Exploration personnel took the author directly to the specific site in question. This report describes the archaeological/heritage traces that were observed at the site.

Observations were limited by what was visible at the surface. It is possible that archaeological material of significance may occur subsurface. If encountered this should be brought to the attention of heritage authorities for further assessment, and mitigation if necessary.

In terms of this report, no significant heritage traces were found at the particular locale of proposed drilling, nor in the immediate vicinity, that are considered to require further mitigation.

The loss of heritage resources is assessed to be of **low** significance with and without the implementation of mitigation.

## **Background**

The McGregor Museum Archaeology Department was appointed by The De Beers Group of Companies: Exploration Office – DBGS in order to conduct a Phase 1 Heritage Impact Assessment at a proposed drilling site at Ferny Hoek Flat 108, west of Kimberley, Northern Cape. This report addresses the possible impacts on heritage resources (archaeological and cultural) of this operation. It excludes palaeontological assessment.

The site was inspected on 22 September 2020 and relevant observations are indicated in this report.

Fieldnotes and photographs are lodged with the McGregor Museum, Kimberley.

## **Specialist**

The author is a professional archaeologist (PhD) accredited as a Principal Investigator by the Association of Southern African Professional Archaeologists. He has worked as a museum archaeologist and has carried out specialist research and surveys in the Northern Cape since 1985.

The author is independent of the organization commissioning this specialist input, and provides this heritage assessment (archaeology and colonial history but not palaeontology) within the framework of the National Heritage Resources Act (No 25 of 1999).

The National Heritage Resources Act no. 25 of 1999 (NHRA) protects heritage resources which include archaeological and palaeontological objects/sites older than 100 years, graves older than 60 years, structures older than 60 years, as well as intangible values attached to places. The Act requires that anyone intending to disturb, destroy or damage such sites/places, objects and/or structures may not do so without a permit from the relevant heritage resources authority.

Heritage is assessed in terms of a NEMA application, and must comply with section 38(3) of the NHRA. SAHRA would then comment and make recommendations on the potential impacts.

(Where archaeological sites and palaeontological remains are concerned, the South African Heritage Resources Agency (SAHRA) at national level acts on an agency basis for the Provincial Heritage Resources Agency (PHRA) in the Northern Cape. The Northern Cape Heritage Resources Authority (formerly called Ngwao Bošwa ya Kapa Bokone) is responsible for the built environment and other colonial era heritage and contemporary cultural values).

## **Description of environment and potential impacts**

The environment in question is a plain (Hutton Sands) east of Vaal River and downslope from a local range of Ventersdorp hills, adjacent to the road between Kimberley and Schmidtsdrift. It is about 7 km east of Schmidtsdrift. An apparent subsurface anomaly suggesting a possible kimberlite is overlain by Hutton Sands supporting Kimberley thornveld typified by *Vachellia erioloba* and *Vachellia tortilis*, with *Senegalia mellifera* (swarthaak), with grass. The soil profile consists of deep aeolian Hutton sand.



Figure 1. Landscape and vegetation on Ferny Hoek Flat 108.

The proposed drilling locale is indicated in the following maps.



Figure 2. Locality: Ferny Hoek Flat 108 (white square) relative to Schmidtsdrift, near to the road to Kimberley.



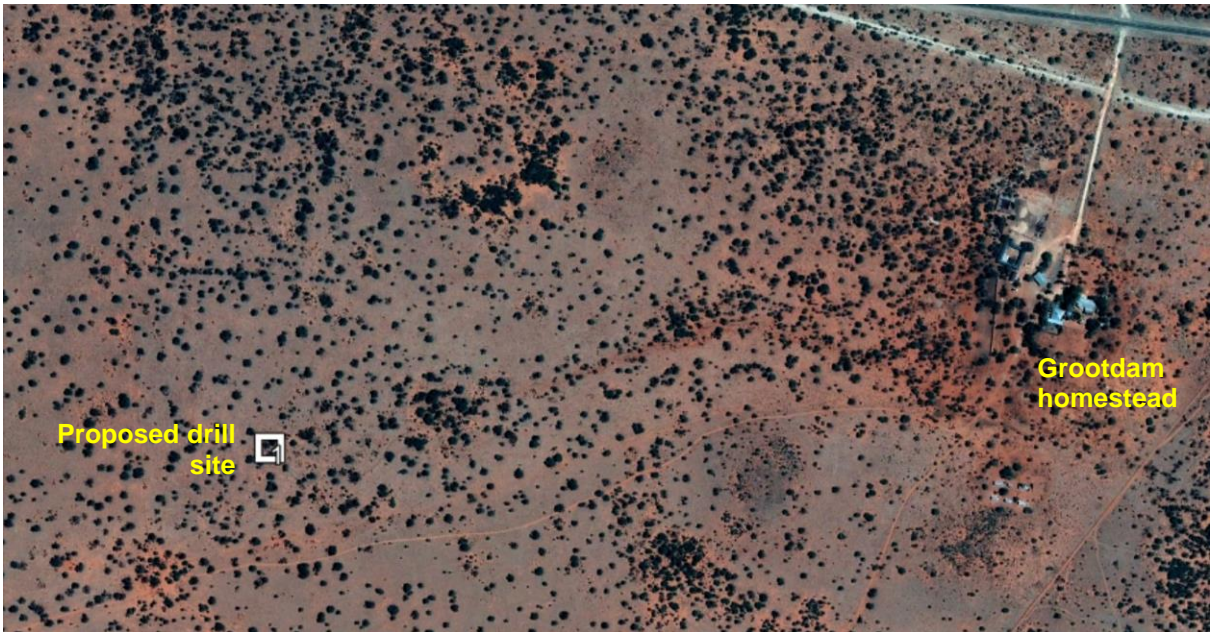


Figure 3. Locality map: Drill site on Ferny Hoek Flat 108 (detail from Figure 2).

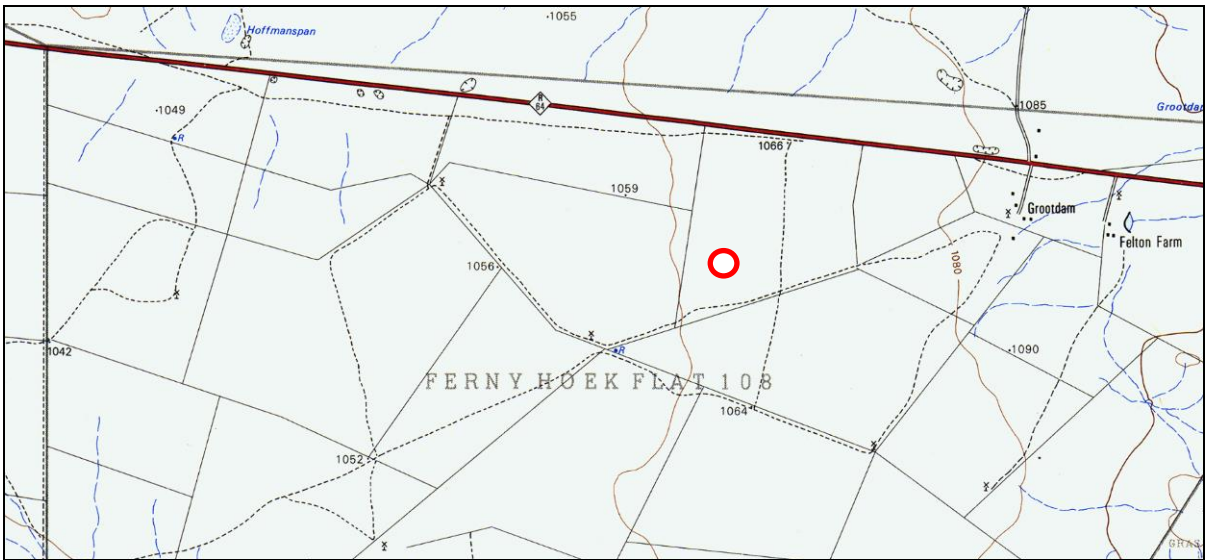


Figure 4. Locality map extract from 1:50 000 2824CA: Drill site on Ferny Hoek Flat 108.

In terms of heritage features of the region, the following introductory comments may be made:

Previous studies

SAHRIS provides no pertinent records for the immediate vicinity. Case ID 6674 refers to the proposed Ferny Hoek Flat 108 prospecting by De Beers as envisaged in the present report, and no heritage studies had yet been undertaken for this case or any other in the immediate environment. In the wider environment, sites along the Vaal

River upstream and downstream of Schmidtsdrift, including accumulations of Pleistocene lithics (e.g. van Ryneveld 2005) as well as rock art (Fock & Fock 1979; 1989) are significant. Beyond the Vaal there are important late Holocene sites in shelters along the Ghaap Escarpment (e.g. Humphreys & Thackeray 1983 for locales at Dikbosch and Limerock).

The landscape setting on Ferny Hoek Flat 108 is distinctive from the Vaal River sites, has no local rocky outcrops that might have supported rock engravings, and is unlike the escarpment setting where rock shelters occur.

Recent history

An 1882 diagram at the Chief Surveyor General's office (including that illustrated in Fig. 5) indicates that Quitrent Title was issued in favour of one John Anderson on 15 June 1882. Previously the farms in this vicinity, prior to their incorporation into the Crown Colony of Griqualand West, would have belonged to Griqua frontiersmen; while San hunter-gatherers are recorded as living east of the Vaal River in the early nineteenth century (Humphreys 1975).

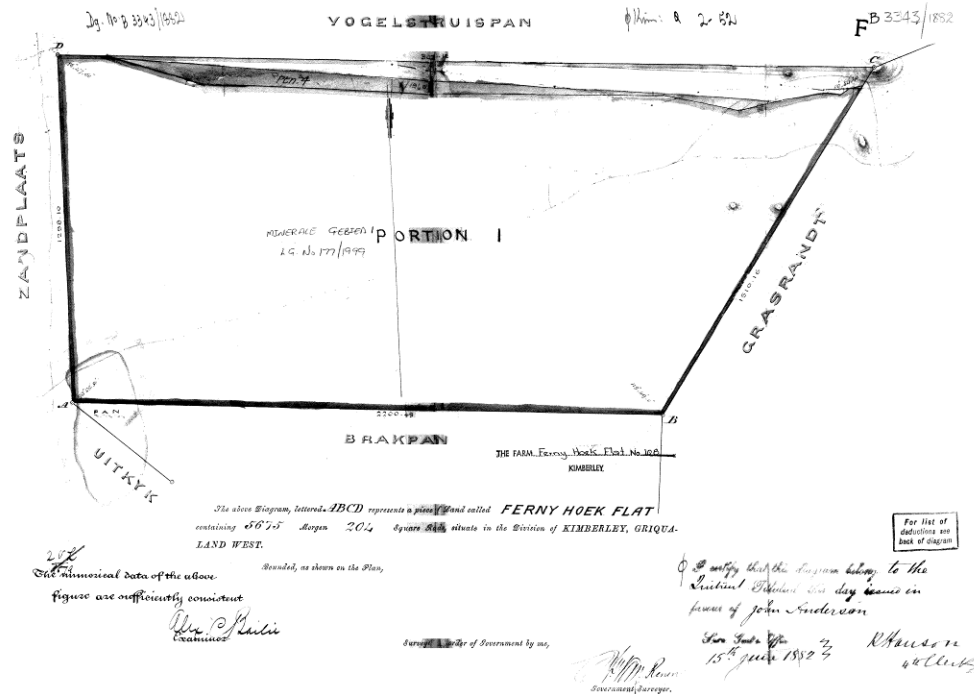


Figure 5. 1882 diagram at the Chief Surveyor General's office referred to above.

Stone Age

Stone Age material found in the broader region spans the Earlier, Middle and Later Stone Ages through Pleistocene and Holocene times (Humphreys & Thackeray 1983; Beaumont & Morris 1990; van Ryneveld 2005). Many sites along the Vaal River are

already impacted by mining. Pleistocene sites are also known from and researched at pan-side sites at Doornlaagte and Rooddam, further east along the route to Kimberley (Beaumont & Morris 1990; Richardt in Morris & Beaumont 2004). Rock art in the form of engravings is known to occur on andesite outcropping on the east side of the Vaal River at Rooipoort and near Schmidtsdrift. Andesite does not exist in the vicinity of the drilling site on Ferny Hoek Flat 108, and rock shelters where paintings tend to occur are confined to the Ghaap Escarpment west of the Vaal River.

### **Description and evaluation of environmental issues and potential impacts**

Heritage resources including archaeological sites are in each instance unique and non-renewable resources. Area and linear developments can have a permanent destructive impact on these resources in cases where they are impacted. The objective of this study is to assess the significance of such resources, where present, and to recommend no-go or mitigation measures (where necessary) to facilitate or constrain the development.

Area impacts that would be spatially constrained within a few metres would occur in the area of the drilling site under consideration. An existing farm road leads close to the vicinity of the drill site and no major scraping or surface disturbance is expected to manouvre drilling equipment. The drive-in to the site was along the route in question.

### **Direct, indirect and cumulative impacts (in terms of nature and extent)**

The destructive impacts that are possible in terms of heritage resources would be direct once-off events occurring during drilling.

Indirect and cumulative impacts could result from on-going use of the site should further developments ensue.

### **Statement of significance**

In addition to guidelines provided by the National Heritage Resources Act, a set of criteria based on Deacon nd and Whitelaw 1997 for assessing archaeological significance has been developed for Northern Cape settings (Morris 2000a).

#### *Estimating site potential*

Table 1 is a classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon nd, National Monuments

Council). Type 3 sites tend to be those with higher archaeological potential. There are notable exceptions, such as the renowned rock art site Driekopseiland, near Kimberley, which is on landform L1 Type 1. Generally, moreover, the older a site the poorer the preservation. Estimation of potential, in the light of such variables, thus requires some interpretation.

#### *Assessing site value by attribute*

The second matrix (Table 2) is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes. While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general archaeological significance of a site, with Type 3 attributes being those of highest significance.

**Table 1. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, National Monuments Council).**

Class	Landform	Type 1	Type 2	Type 3
L1	Rocky surface	Bedrock exposed	Some soil patches	Sandy/grassy patches
L2	Ploughed land	Far from water	In floodplain	On old river terrace
L3	Sandy ground, inland	Far from water	In floodplain or near feature such as hill	On old river terrace
L4	Sandy ground, Coastal	>1 km from sea	Inland of dune cordon	Near rocky shore
L5	Water-logged deposit	Heavily vegetated	Running water	Sedimentary basin
L6	Developed urban	Heavily built-up with no known record of early settlement	Known early settlement, but buildings have basements	Buildings without extensive basements over known historical sites
L7	Lime/dolomite	>5 myrs	<5000 yrs	Between 5000 yrs and 5 myrs
L8	Rock shelter	Rocky floor	Sloping floor or small area	Flat floor, high ceiling
Class	Archaeo-logical traces	Type 1	Type 2	Type 3
A1	Area previously excavated	Little deposit remaining	More than half deposit remaining	High profile site
A2	Shell or bones visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick; shell and bone dense
A3	Stone artefacts or stone walling or other feature visible	Dispersed scatter	Deposit <0.5 m thick	Deposit >0.5 m thick

**Table 2. Site attributes and value assessment (adapted from Whitelaw 1997)**

Class	Attribute	Type 1	Type 2	Type 3
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1	Length of sequence/context	No sequence Poor context Dispersed distribution	Limited sequence	Long sequence Favourable context High density of arte/ecofacts
2	Presence of exceptional items (incl regional rarity)	Absent	Present	Major element
3	Organic preservation	Absent	Present	Major element
4	Potential for future archaeological investigation	Low	Medium	High
5	Potential for public display	Low	Medium	High
6	Aesthetic appeal	Low	Medium	High
7	Potential for implementation of a long-term management plan	Low	Medium	High

### **Methodology for HIA assessment**

A field visit to inspect the drilling site was undertaken on 22 September 2020 in the company of De Beers Exploration geologist Jacobus van den Heever. An assessment was made of heritage traces at the proposed drilling locale.

Grassy vegetation cover is relatively sparse at the site, but a depth of Hutton Sands obscures possible palaeo-surfaces where archaeological material may occur.

### **Observations**

The proposed drill site situated at X(E) 24.217465° Y(S) -28.721464° (Fig. 9): The surface here consists of Hutton Sands possibly of up to a few metres depth. At the surface in the immediate vicinity and over tens of metres radius around the drill site, not a single archaeological trace was in evidence. It is possible that material may occur below the surface. A nearby former drill-site yielded a clues to sub-surface rock but no trace of artefacts.



Figure 6. Vicinity of drillhole: Hutton Sands, no surface archaeological or other heritage traces. Disturbance features (burrows, older drill site) yielded no clues to archaeological material from below the surface.

No other archaeological or cultural materials of any age were noted at the drill site.

Access to the site would be along existing farm tracks to the immediate vicinity of the drill site; hence, no impacts are anticipated.

### **Characterising the significance of heritage traces and contexts**

In terms of Tables 1 and 2 (above), the classification of landforms and visible archaeological traces for estimating the potential for archaeological material at the proposed drilling site (Table 1) suggests landscape L3 Type 1 (generally poor potential) and archaeological trace Class A3 Type 1 (likely to be insignificant). Table 2 site attribute and value assessment criteria suggest Type 1 for all of the Classes 1-7 (low significance).

Archaeological significance in terms of these criteria for the drilling site is thus consistently LOW.

## Characterising the significance of impacts

The following criteria are used in this study to characterise the significance of direct, indirect and cumulative impacts:

- The **nature**, which shall include a description of what causes the effect, what will be affected, and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional:
  - local extending only as far as the development site area – assigned a score of 1;
  - limited to the site and its immediate surroundings (up to 10 km) – assigned a score of 2;
  - will have an impact on the region – assigned a score of 3;
  - will have an impact on a national scale – assigned a score of 4; or
  - will have an impact across international borders – assigned a score of 5.
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years) – assigned a score of 2;
  - medium-term (5–15 years) – assigned a score of 3;
  - long term (> 15 years) – assigned a score of 4; or
  - permanent – assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.

- The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- the **significance**, which shall be determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
- the **status**, which will be described as either positive, negative or neutral.
  - the degree to which the impact can be reversed.
  - the degree to which the impact may cause irreplaceable loss of resources.
  - the *degree* to which the impact can be *mitigated*.

The **significance** is determined by combining the criteria in the following formula:

**S= (E+D+M) P**; where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

***Impact table summarising the significance of impacts the Ferny Hoek Flat 108 proposed drilling site***

<b>Nature</b>		
Acts or activities resulting in disturbance of surfaces and/or sub-surfaces containing artefacts (causes) resulting in the destruction, damage, excavation, alteration, removal or collection from its original position (consequences), of any archaeological material or object (what affected).		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Local (1)	Local (1)
<b>Duration</b>	Permanent (5) where archaeological material is impacted – but this has been rated as insignificant and not requiring mitigation	Permanent – but no mitigation regarded as necessary (5)
<b>Magnitude</b>	Minor (2)	Minor (2)
<b>Probability</b>	Improbable (2)	Improbable (2)
<b>Significance</b>	<b>Low (16)</b>	<b>Low (16)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	No	No
<b>Irreplaceable loss of resources?</b>	No artefacts seen in the vicinity of the proposed drilling site. No irreplaceable loss expected.	
<b>Can impacts be mitigated?</b>	No traces noted on the ground: mitigation not regarded as necessary other than by way of on-going management as per EMP in case unexpected archaeological material is encountered sub-surface.	On-going management as per EMP
<b>Mitigation:</b>		
Specific mitigation measures at the drilling site not regarded as necessary. Possible (unlikely) subsurface Stone Age archaeological traces could include artefact occurrences, burials or ostrich eggshell cache. In the event of any such materials/features being found, halt work and report immediately to SAHRA.		
<b>Cumulative Impacts:</b>		
Where any archaeological contexts occur the impacts are once-off permanent destructive events. Future infrastructure development may lead to spatially extended impacts in the vicinity. EMP should provide for on-going monitoring.		
<b>Residual Impacts:</b>		
Depleted archaeological record if/where present.		



## MEASURES FOR INCLUSION IN THE DRAFT ENVIRONMENTAL MANAGEMENT PLAN

OBJECTIVE: Archaeological or other heritage materials occurring in the path of any surface or sub-surface disturbances associated with any aspect of the development are highly likely to be subject to destruction, damage, excavation, alteration, or removal. The objective should be to limit such impacts to the primary activities associated with drilling and hence to limit secondary impacts during the medium and longer term if further development occurs.

<b>Project component/s</b>	Any road construction over and above what is necessary and any extension of other components.
<b>Potential Impact</b>	The potential impact if this objective is not met is that wider areas or extended linear developments may result in further destruction, damage, excavation, alteration, removal or collection of heritage objects from their current context in the area.
<b>Activity/risk source</b>	Activities which could impact on achieving this objective include deviation from the planned drilling site and of access road/s without taking heritage impacts into consideration.
<b>Mitigation: Target/Objective</b>	A drilling environmental management plan that takes cognizance of heritage resources in the event of any future expansion, access roads or other infrastructure.

<b>Mitigation: Action/control</b>	<b>Responsibility</b>	<b>Timeframe</b>
Provision for on-going heritage monitoring in a facility environmental management plan which also provides guidelines on what to do in the event of any major heritage feature being encountered during any phase of development or operation.	Environmental management provider with on-going monitoring.	Environmental management plan to be in place before commencement of development.
Localize drilling activity and impacts in the immediate vicinity of the proposed drilling site.		

<b>Performance Indicator</b>	Inclusion of further heritage impact consideration in any future expansion or infrastructural elements. Immediate reporting to relevant heritage authorities of any heritage feature discovered during drilling operations.
<b>Monitoring</b>	Officials from relevant heritage authorities (National and Provincial) to be permitted to inspect the operation at any time in relation to the heritage component of the management plan.

## CONCLUSIONS

No archaeological artefacts were noted at or near the proposed drilling site. No colonial era or other cultural resources or features were in evidence. Archaeological significance was determined to be consistently low in terms of all criteria by which they were measured. Potential for subsurface material occurring is pointed out:

sometimes at the base of Hutton Sands artefacts are known to occur on older surfaces in this environment, with other possible occurrences including burials and caches of ostrich eggshell flasks, but the likelihood of this is reckoned to be negligible. Steps for reporting any such archaeological material, if found, are indicated.

At the specific drilling site reported on, it is not regarded as necessary to carry out mitigation.

## **Acknowledgements**

I thank Jacobus van den Heever of De Beers for setting up the site visit and guiding me to inspect the site.

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