

McGregor Museum

Department of Archaeology



Heritage Impact Assessment for proposed drilling site at Treurhoek/Doorndam, south east of Boshof, western Free State.

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May 2016

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17 May 2016

Executive Summary

A Phase 1 Heritage Impact Assessment is presented.

Precise co-ordinates for proposed drilling were presented and De Beers Exploration personnel took us directly to the specific site in question. This report describes the archaeological/heritage traces that were observed 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 that are considered to require further mitigation. Two clusters of farm burials are located nearby, requiring particular care, however, in the spatial containment of activity associated with the drilling.

The loss of heritage resources is assessed to be of **low** significance with and without the implementation of mitigation other than measures required with respect to the burial sites situated nearby.

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 sites at Doornadam/Treurhoek south east of Boshof in the western Free State. This report addresses the possible impacts on heritage resources (archaeological and cultural) of this operation. It excludes palaeontological assessment.

The site was inspected on 13 May 2016 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 and western Free State 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) provides general protection to 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. This means that a Heritage Impact Assessment should be performed, resulting in a specialist report as required by the relevant heritage resources authority/ies to assess whether authorisation may be granted for the disturbance or alteration, or destruction of heritage resources.

Where archaeological sites and palaeontological remains are concerned, the South African Heritage Resources Agency (SAHRA) at national level acts on an agency basis for Provincial Heritage Resources Agencies (PHRAs) which have not been accredited for these categories of heritage management.

Description of environment and potential impacts

The environment in question consists of essentially flat terrain which lies about 2 km north of the Modder River. The relatively sparse Karoo vegetation on clayey soil makes for high archaeological visibility for any traces at the surface. Stone Age material would very possibly be buried subsurface, as has been noted routinely at other sites in the region (e.g. Beaumont & Morris 1990).

The locality is indicated in the following map.

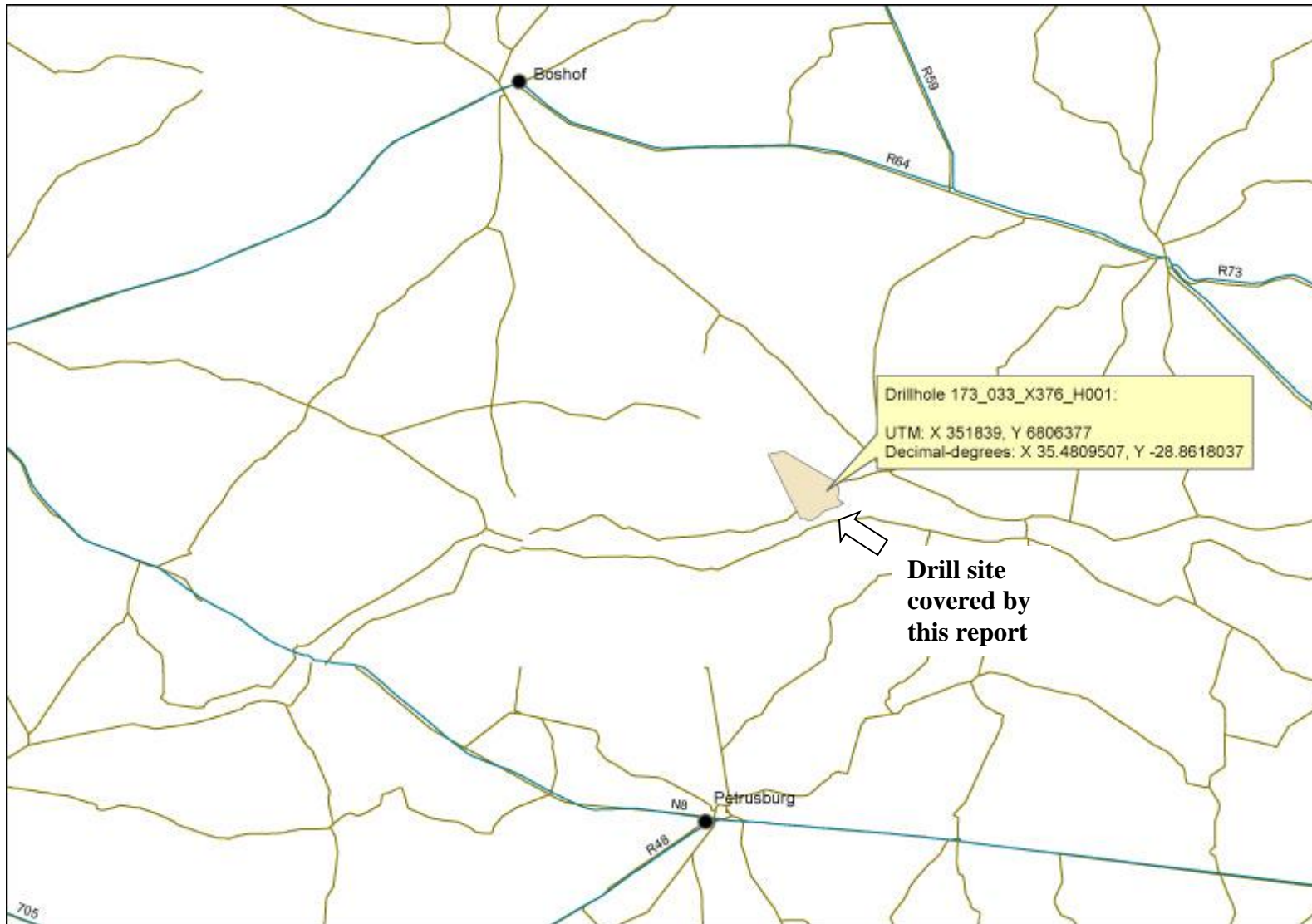


Figure 1: Locality Map

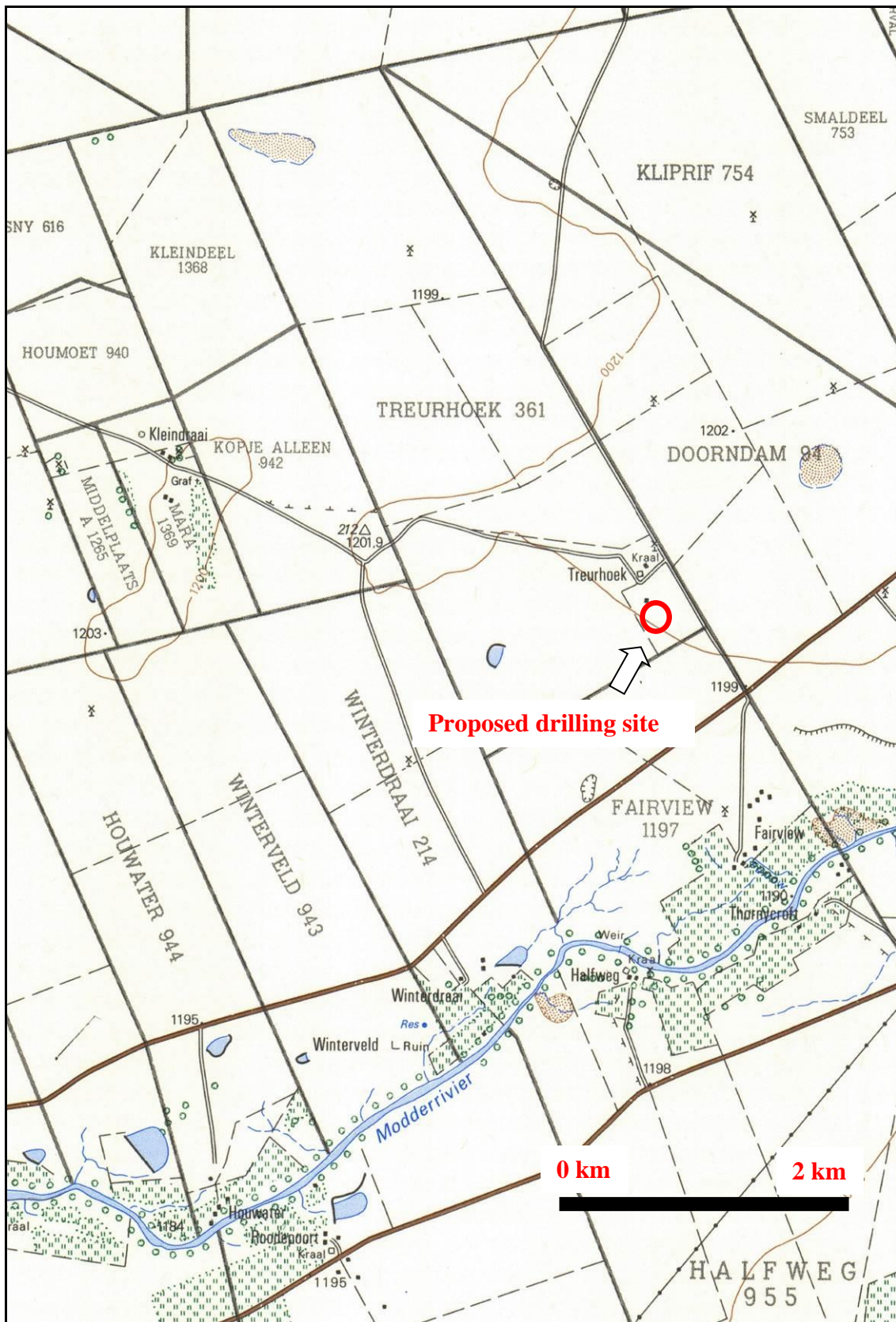


Figure 2. Extract from 1:50 000 sheet 2825 CD showing locality of drilling site

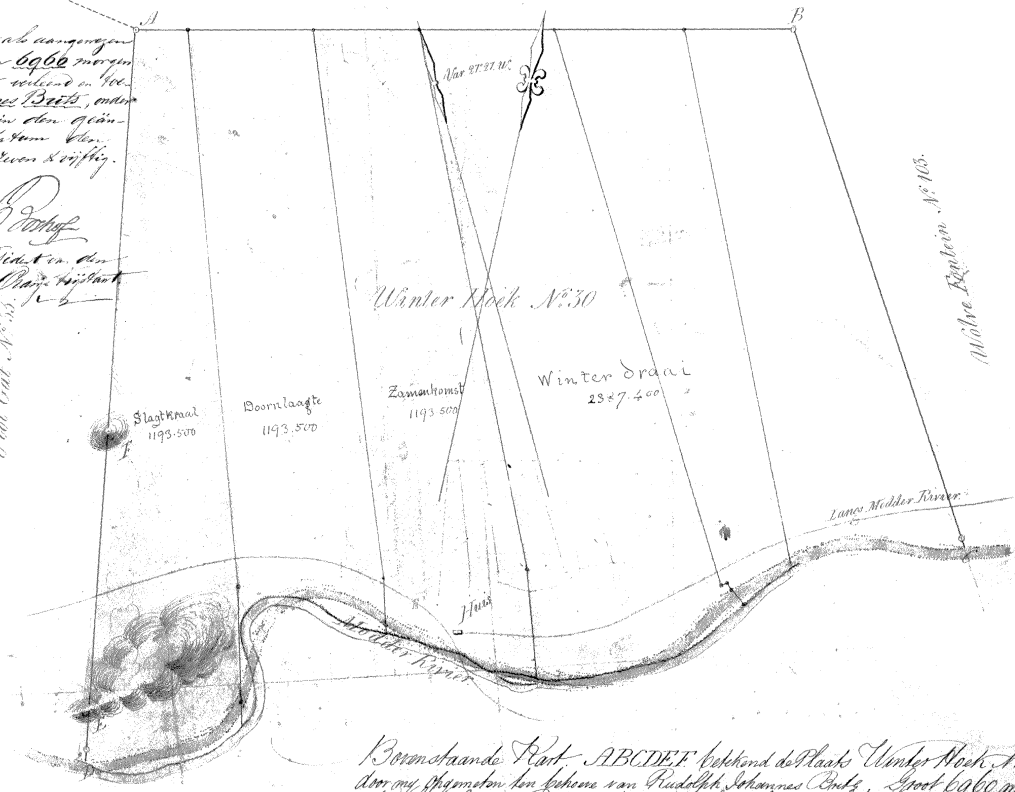


Figure 3. Google Earth image showing position proposed drilling site.

*De plaats Treurhoek als aangegeven
op deze kaart, toegevoegd van 1960 morgen
in 1793 voortaan den Erfpacht verhuurd en toe-
gekomen aan Rudolph Johannes Britz, onder
voorwaarde als opgeschreven in den Oor-
boek van de Gens. bijt. met datum den
Zeventienden September 1800 Seven & vijftig.*

Van deze kaart wordt een afschrift afgegeven
op schriftelijk Verzoek opzichzende
ZAMENKOMST EN WINTERHOEK
BOORNLAAGTE
p. 1833
BOSHOFF 366

Britz
Rijcht in den
Oorboek
Wol. Cat. N^o 55

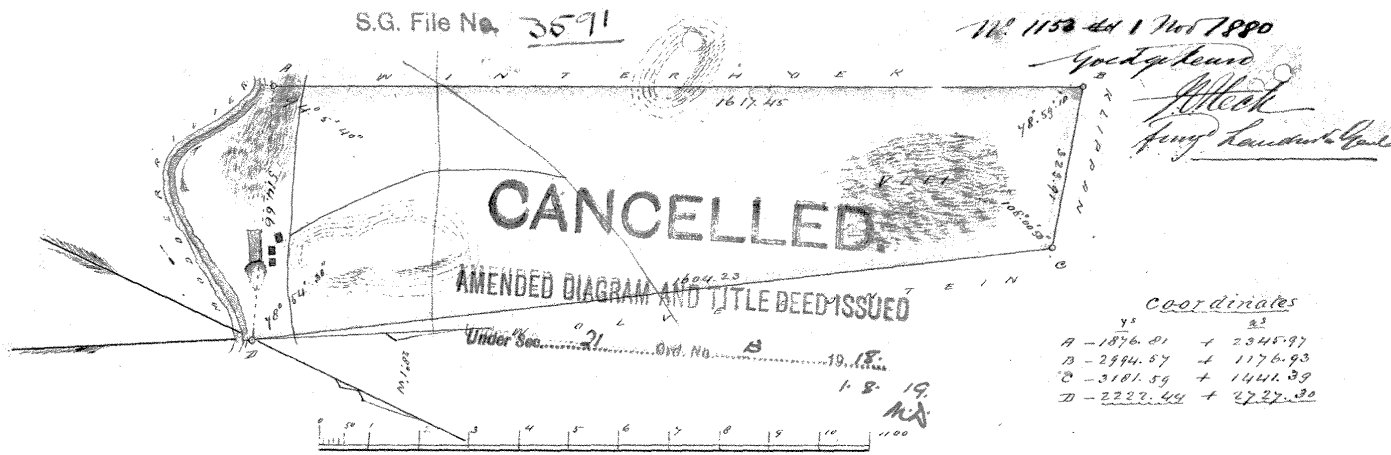


*Boornstaande kaart A B C D E F behoudt de plaats Winter Hoek N^o 30
door mij opgemaakt ten behoeve van Rudolph Johannes Britz, op 1960 morgen
opgevoerd langs Melles Rivier afkomst van K. de S. ten. en Treurhoek 300-10
naar de plaats aangegeven.*

John H. Ford
Gouvern^{mt} Oréond.

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BOSHOFF 366

Figure 4. 1833 survey map indicating the area now known as Treurhoek, a portion of Winter Hoek, in possession of Rudolph Johannes Britz in that year.



TREURHOEK N^o 361 10 deel Winterhoek N^o 361
 Groot 1193 Morgen & 500 □ Bleden
 Gelegen in de Wyk Maadlerwieser district Boshof
 Eigenaar Andries Johannes Richter by Transport
 Acte N^o 19793 geregistreerd den 8^{de} January 1878
 Gemeten in Februarij 1878

door mij
A. P. Kraap
Carst Pauwels
 BOSHOF 361

Sept. 25 Aug 1880 Mans Kivvan Schalk Millem Forme
 14 J. v. 24836

BOSHOF 361

Figure 5. In 1878 the portion of Winterhoek known as Treurhoek was transferred to Andries Johannes Richter.

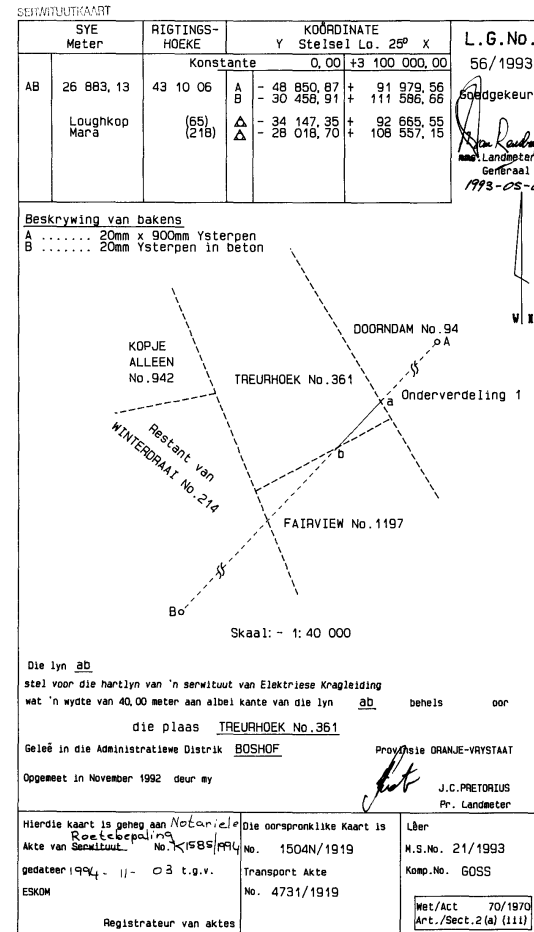
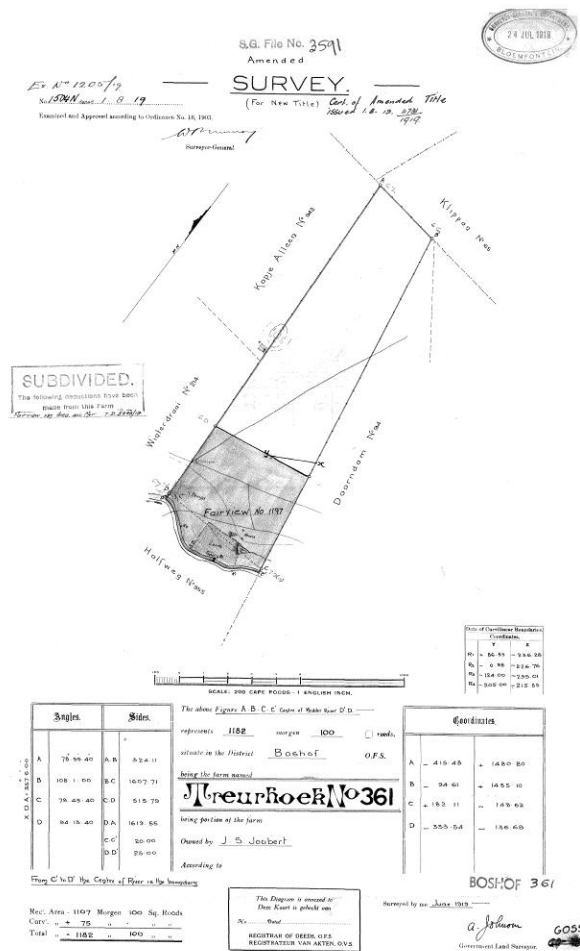


Figure 6. The portion Treurhoek was subdivided in 1919; and a powerline servitude across it was registered in 1993.

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

Previous studies

SAHRIS provides no records for the immediate vicinity, indicative that no previous studies/surveys have been conducted in that area.

Colonial history

A series of plans at the Chief Surveyor General's office (Figs. 4-6) provide insight into the history of rural colonial settlement in the western Free State, with the far now known as Treurhoek having originated as a portion of with the larger Winterhoek, in possession of Rudolph Johannes Britz as early as 1833. From 1878 it belonged to Andries Johannes Richter. Graves on the property indicate subsequent ownership by the Neethling family. It apparently remains in possession of that family (Daphne van der Westhuizen pers.comm.). Comments below will refer to farm labour residence on the farm.

Stone Age

Stone Age material found in the broader region spans the Earlier, Middle and Later Stone Ages through Pleistocene and Holocene times (Beaumont & Morris 1990). To the south, along the Riet River, are "Type R" stone walled settlements that date from within the last thousand years – but these have not been documented along the Modder River (Humphreys 1972). Rock art in the form of engravings is known to occur on dolerite ridges and koppies in the area (Wilman 1933; Morris 1988) – but such koppies do not occur near to the Treurhoek site.

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 would occur in the area of the drilling site under consideration.

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

The destructive impacts that are possible in terms of heritage resources would tend to 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 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 and, 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,	>1 km from sea	Inland of dune cordon	Near rocky shore

Class	Landform	Type 1	Type 2	Type 3
	Coastal			
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
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 site visit to inspect the site was planned for 13 May 2016 in the company of De Beers Exploration personnel Daphne van der Westhuizen. An assessment was made of heritage traces at the proposed drilling locale.

The sparse vegetation made it easy to detect any archaeological material that may occur at the surface, but it was possible that artefacts would occur sub-surface.

Observations

The site was found to consist of an almost completely flat surface in a broad plain some 2 km north of the Modder River.



Figure 7. Proposed drill site at 28°51'42.5" S 25°28'52.1" E; Treurhoek homestead in the background.

Artefacts were almost entirely absent from the surface over a large area of about 80 x 20 m traversed. Two flakes were noted, highly weathered, on hornfels, probably Middle Stone Age (Fig. 8).

As isolated surface finds they lack archaeological integrity but are an indication of the occurrence of such material locally, and possibly higher densities below the present surface in this landscape.



Figure 8. Artefacts found at the site.

No organic archaeological remains were found.

In terms of colonial era history, the evidence of division of the landscape and farm ownership by incoming white colonial settlers is touched on above (see Figs. 4-6). A farm graveyard with graves for members of the Neethling family is situated at $28^{\circ}51'34.5''$ S $25^{\circ}28'57.5''$ E.





Figures 9 & 10. Grave of Francois Jacon Neethling 25 Nov 1889 – 10 Dec 1950.



Figure 11. The second and third of three graves – detail in Figures 12 & 13 below.
Elsie H.J. Neethling (du Toit) 1 Dec 1896 – 31 Mar 1951 & Gerhardus Johannes Badenhorst Neethling 19 Apr 1893 – 20 Sep 1950.



Figures 12 & 13. Detail on headstones.



A second farm graveyard was pointed out at 28°51'43.6" S 25°28'51.3" E. This is situated closer, about 40 m, from the proposed drill site. It is incompletely fenced, the fencing in a bad state of repair. Particular care is needed to constrain the drilling operation in relation to this site. It is advisable further to repair and extend the fencing around this farm burial site. Four graves covered by stone, brought in from elsewhere in the landscape, are probably older than three large graves which are

capped with bricks. There are no inscriptions. These are clearly farm worker graves. They are situated about 180 m south west of an abandoned farm worker dwelling (adjacent to which there is also an ashheap).



Figures 14 & 15. Farm worker graves with brick and stone cappings. The fencing does not contain all the graves.





Figure 16. Scattered debris relating to the farm worker dwelling near the drill site includes discarded enamel items such as this as well as other metal objects and bottle glass.



Figure 17. Abandoned farm worker dwelling; ashheap to left.

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 sites *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).

Clearly the graves are of high significance and sensitivity, necessitating care in localizing drilling activity and impacts in the immediate vicinity of the proposed drilling site. An added measure of protection for the farm worker graves would be to repair the fencing there and extend it to include all seven graves.

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 at Treurhoek/Doordam drilling site

Nature		
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).		
	Without mitigation	With mitigation
Extent	Local (1)	Local (1)
Duration	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)
Magnitude	Minor (2)	Minor (2)
Probability	Improbable (2)	Improbable (2)
Significance	Low (16)	Low (16)
Status (positive or negative)	Negative	Negative
Reversibility	No	No
Irreplaceable loss of resources?	Very few artefacts noted, lacking context.	
Can impacts be mitigated?	Minimal traces noted on the ground: Not regarded as necessary other than by way of on-going management as per EMP. With regard to nearby farm graves: these are of high sensitivity: care is needed to localize drilling activity strictly in the immediate vicinity of the proposed	On-going management as per EMP Localize drilling activity to avoid impact on graves; repair and extend fencing around graves.

	drilling site. An added measure of protection for the farm worker graves in particular would be to repair the fencing there and extend it to include all seven graves.	
Mitigation:		
Specific mitigation measures at the drilling site not regarded as necessary. Possible subsurface Stone Age archaeological traces including possible unmarked Stone Age burials in this environment. Report immediately to SAHRA if any major feature is found. Localize drilling activity to avoid impact on farm graves; repair and extend fencing around farm worker graves.		
Cumulative Impacts:		
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.		
Residual Impacts:		
Depleted archaeological record 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.

Project component/s	Any road construction over and above what is necessary and any extension of other components.
Potential Impact	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.
Activity/risk source	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.
Mitigation: Target/Objective	A drilling environmental management plan that takes cognizance of heritage resources in the event of any future expansion, access roads or other infrastructure.

Mitigation: Action/control	Responsibility	Timeframe
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	Environmental management provider with on-going monitoring.	Environmental management plan to be in place before commencement of development.

of development or operation.

Localize drilling activity and impacts in the immediate vicinity of the proposed drilling site. As added measure of protection for the farm worker graves, repair and extend fencing to include all seven identified farm worker graves.

Performance Indicator	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.
Monitoring	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

Very few stone artefacts were found on the surface in the vicinity and none at the actual proposed drilling site. Colonial/historical/cultural resources in the local area do include farm grave sites and traces relating to a nearby farm worker dwelling. Spatially constrained drilling activity would not impact on these resources.

From an archaeological perspective the observed heritage resources (other than the ggraves) may be regarded as being of low significance, but with the potential for subsurface occurrences.

At the specific drilling site it is not regarded as necessary to carry out mitigation. Recommendations are provided for adding protection to the nearby farm worker graves.

References

- Beaumont, P.B. & Morris, D. 1990. *Guide to archaeological sites in the Northern Cape*. Kimberley: McGregor Museum.
- Deacon, J. nd. Archaeological Impact Assessment - specialist input to planning and design. Unpublished notes compiled for the National Monuments Council.
- Morris, D. 1988. Engraved in place and time: a review of variability in the rock art of the Northern Cape and Karoo. *South African Archaeological Bulletin* 43:109-121.
- Morris, D. 2000a. Gamsberg Zinc Project environmental impact assessment specialist report: archaeology. Unpublished report, McGregor Museum.

Morris, D. & Beaumont, P. 2004. *Archaeology in the Northern Cape: some key sites*. Kimberley: McGregor Museum.

Wilman, M. 1933. *Rock engravings of Griqualand West and British Bechuanaland, South Africa*. Cambridge: Deighton Bell.