Heritage impact survey report for JANHO QUARRY, DRIEFONTEIN 179IQ, KRUGERSDORP MAGISTERIAL DISTRICT, GAUTENG PROVINCE

THE PROJECT:

Expansion of existing quarry operations.

THIS REPORT:

HERITAGE IMPACT SURVEY REPORT FOR JANHO QUARRY, DRIEFONTEIN 179IQ, KRUGERSDORP MAGISTERIAL DISTRICT, GAUTENG PROVINCE

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Prepared for:

Holgate, Meyer & Associates

Representative: Ms. T Kneidinger

Postal Address: P O Box 641, Featherbrooke Estate, Mogale City, 1746

Tel: (011) 662 2276 E-mail: tanya@holgate.co.za

Prepared by:

J van Schalkwyk (D Litt et Phil), Heritage Consultant

ASAPA Registration No.: 168

Principal Investigator: Iron Age, Colonial Period, Industrial Heritage

Postal Address: 62 Coetzer Avenue, Monument Park, 0181

Mobile: 076 790 6777 Fax: 012 347 7270

E-mail: jvschalkwyk@mweb.co.za

EXECUTIVE SUMMARY

HERITAGE IMPACT SURVEY REPORT FOR JANHO QUARRY, DRIEFONTEIN 179IQ, KRUGERSDORP MAGISTERIAL DISTRICT, GAUTENG PROVINCE

The aim of the survey was to locate, identify, evaluate and document sites, objects and features of cultural significance found within the boundaries of the area in which it is proposed to expand the Jahno Quarry.

Previous EMP's indicated the presence of graves on the site. All available resources and databases were accessed in order to determine origin and location of these graves. However, no information could be obtained. An intensive survey of the area identified in the original EMP's as the location of the graves, produced nothing. In fact, this area has been subjected to intensive mining activities.

Therefore, as no sites, features or artefacts of cultural significance were identified in the study area that would require the development plan to be changed, it is recommended that the proposed development can continue in the area, on condition of acceptance of the following recommendations:

• If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

J A van Schalkwyk Heritage Consultant

TECHNICAL SUMMARY

Property details						
Province	Gauteng					
Magisterial district	Krugersdorp					
Topo-cadastral map	252	2527DD, 2627BB				
Closest town	Joha	Johannesburg				
Farm name & no.	Drie	Driefontein 179IQ				
Portions/Holdings	Remaining extent of Portion 10					
Coordinates	Polygon					
	No	Latitude	Longitude	No	Latitude	Longitude
	1	S 26.00387	E 27.85503	4	S 25.99775	S 27.84923
	2	S 26.00434	E 27.85001	5	E 25.99889	E 27.85328
	3	S 26.00271	E 26.84572			

Development criteria in terns of Section 38(1) of the NHR Act	Yes/No
Construction of road, wall, power line, pipeline, canal or other linear	
form of development or barrier exceeding 300m in length	
Construction of bridge or similar structure exceeding 50m in length	
Development exceeding 5000 sq m	Yes
Development involving three or more existing erven or subdivisions	Yes
Development involving three or more erven or divisions that have been	
consolidated within past five years	
Rezoning of site exceeding 10 000 sq m	Yes
Any other development category, public open space, squares, parks,	
recreation grounds	

Development	
Description	Expansion of existing quarrying activities
Project name	Janho Quarry

Land use	
Previous land use	Farming
Current land use	Mining

Heritage sites assessment				
Site type	Site significance	Site grading (Section 7 of NHRA)		
None				
Impact assessment				
Impact	Mitigation	Permits required		
None				

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GLOSSARY OF TERMS AND ABBREVIATIONS

STONE AGE

Early Stone Age 2 000 000 - 150 000 Before Present (BP)

Middle Stone Age 150 000 - 30 000 BP Late Stone Age 30 000 - until c. AD 200

IRON AGE

Early Iron Age AD 200 - AD 900
Middle Iron Age AD 900 - AD 1300
Late Iron Age AD 1300 - AD 1830

HISTORIC PERIOD

Since the arrival of the white settlers - c. AD 1840 in this part of the country

ASAPA Association of Southern African Professional Archaeologists

EIA Early Iron Age
ESA Early Stone Age
LIA Late Iron Age
LSA Late Stone Age
MSA Middle Stone Age

NHRA National Heritage Resources Act

PHRA Provincial Heritage Resources Agency
SAHRA South African Heritage Resources Agency

HERITAGE IMPACT SURVEY REPORT FOR JANHO QUARRY, DRIEFONTEIN 179IQ, KRUGERSDORP MAGISTERIAL DISTRICT, GAUTENG PROVINCE

1. INTRODUCTION

A very large quarry exists on Portion 10 of the farm Driefontein 179IQ. Previous Environmental Management Reports (2004) and subsequent amendments (2005, 2006) indicated the existence of graves on an unspecified section of the property. Correspondence with SAHRA apparently produced no answer. The new mine owners appointed Holgate, Meyer and Associates to compile their ESO. Picking up from the work previously done by Umhlaba Environmental Consultants, they came across references to the location of the graves on the site. However, during site visits they failed to locate the graves. Accordingly, an independent heritage consultant was appointed by **Holgate Meyer and Associates** to conduct a survey to locate, identify and evaluate the graves.

Although this HIA report covers the entire property under consideration, its main aim was to try and identify the graves.

2. TERMS OF REFERENCE

The scope of work consisted of conducting a Phase 1 archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act 25 of 1999).

This include:

- Conducting a desk-top investigation of the area
- · A visit to the proposed development site

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

3. DEFINITIONS AND ASSUMPTIONS

The following aspects have a direct bearing on the survey and the resulting report:

- Cultural resources are all non-physical and physical human-made occurrences, as well as natural occurrences that are associated with human activity. These include all sites, structures and artefacts of importance, either individually or in groups, in the history, architecture and archaeology of human (cultural) development.
- The significance of the sites and artefacts are determined by means of their historical, social, aesthetic, technological and scientific value in relation to their uniqueness, condition of preservation and research potential. It must be kept in mind that the

various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

 Sites regarded as having low significance have already been recorded in full and require no further mitigation. Sites with medium to high significance require further mitigation.

• The latitude and longitude of archaeological sites are to be treated as sensitive information by the developer and should not be disclosed to members of the public.

4. STUDY APPROACH AND METHODOLOGY

4.1 Extent of the Study

This survey and impact assessment covers the area as presented in Section 5 and as illustrated in Figure 1 - 3.

4.2 Methodology

4.2.1 Preliminary investigation

4.2.1.1 Survey of the literature

A survey of the relevant literature was conducted with the aim of reviewing the previous research done and determining the potential of the area. In this regard, various anthropological, archaeological and historical sources were consulted - see the list of references below.

4.2.1.2 Data bases

The Heritage Atlas Database, the Environmental Potential Atlas and the National Archives of South Africa were consulted.

4.2.1.3 Other sources

Aerial photographs and topocadastral and other maps were also studied - see the list of references below.

4.2.2 Field survey

The field survey was done according to generally accepted archaeological practices, and was aimed at locating all possible sites, objects and structures. The area that had to be investigated, was identified by members of **Holgate**, **Meyer and Associates** by means of maps and during a site visit. The area was investigated by walking across it in a number of transects. Special attention was given to topographical occurrences such as trenches, holes, outcrops and clusters of trees were investigated.

4.2.3 Documentation

All sites, objects and structures that are identified are documented according to the general minimum standards accepted by the archaeological profession. Coordinates of individual

localities are determined by means of the *Global Positioning System* (GPS)¹ and plotted on a map. This information is added to the description in order to facilitate the identification of each locality.

Map datum used: Hartebeeshoek 94 (WGS84).

4.3 Limitations

In some areas the grass cover was high and very dense, which limited archaeological visibility to some extent.

5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

5.1 Site location

The study area is located north of the village of Mulderdrift, to the northwest of the junction between the N14 and M5 roads, in the Krugersdorp magisterial district of Gauteng (Fig. 1). It covers Portion 10 of the farm Driefontein 179IQ.

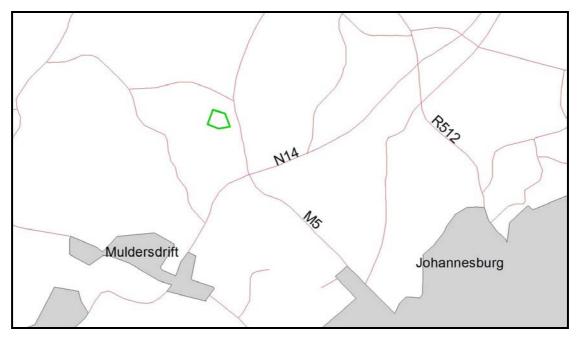


Fig. 1. Location of the study area (green polygon) in regional context.

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¹ According to the manufacturer a certain deviation may be expected for each reading. Care was, however, taken to obtain as accurate a reading as possible, and then to correlate it with reference to the physical environment before plotting it on the map.

5.2 Site description

The geology of the area is made up of granite and the original vegetation is classified as Rocky Highveld Grassland. However, over most of this area it has been destroyed as a result of previous farming activities and the subsequent quarrying activities.

5.3 Regional overview

5.3.1 Stone Age

This section of the highveld area has been inhabited since Early Stone Age (ESA) times. Tools dating to this period are mostly found in the vicinity of watercourses. During Middle Stone Age (MSA) times (c. 150 000 – 30 000 BP), people became more mobile, occupying areas formerly avoided. Open sites were still preferred near watercourses. These people were adept at exploiting the huge herds of animals that passed through the area, on their seasonal migration. Late Stone Age (LSA) people had even more advanced technology than the MSA people and therefore succeeded in occupying even more diverse habitats. Also, for the first time we now get evidence of people's activities derived from material other than stone tools. Ostrich eggshell beads, ground bone arrowheads, small bored stones and wood fragments with incised markings are traditionally linked with the LSA. The LSA people have also left us with a rich legacy of rock art, which is an expression of their complex social and spiritual believes.

5.3.2 Iron Age

Iron Age people started to settle in southern Africa c. AD 300, with one of the oldest known sites at Broederstroom south of Hartebeespoort Dam dating to AD 470. Having only had cereals (sorghum, millet) that need summer rainfall, Early Iron Age (EIA) people did not move outside this rainfall zone, and neither did they occupy the central interior highveld area. Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes, but also for firewood and water.

The occupation of the larger geographical area (including the study area) did not start much before the 1500s. By the 16th century things changed, with the climate becoming warmer and wetter, creating condition that allowed Late Iron Age (LIA) farmers to occupy areas previously unsuitable, for example the Witwatersrand and the treeless plains of the Free State.

5.3.3 Historic period

White settlers moved into the area during the first half of the 19th century. They were largely self-sufficient, basing their survival on cattle/sheep farming and hunting. Few towns were established and it remained an undeveloped area until the discovery of gold. During the Anglo-Boer War, a number of skirmishes occurred in the larger area.

5.4 Identified sites

5.4.1 Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified in the study area.

5.4 2 Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the study area.

5.4.3 Historic period

No sites, features or objects of cultural significance dating to the historic period were identified in the study area.

All available resources and databases were accessed in order to determine origin and location of the graves which were mentioned in the EMP's. However, no information could be obtained. A few sources were identified in the NASA databases, but this all have to do with subdivisions of the property.

An intensive survey of the area identified in the original EMP's as the location of the graves, produced nothing. In fact, this area has been subjected to intensive mining activities.

6. SITE SIGNIFICANCE AND ASSESSMENT

6.1 Statement of significance

According to the NHR Act, Section 2(vi), the **significance** of heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Sites regarded as having low significance are viewed as been recorded in full after identification and would require no further mitigation. Sites with a medium to high significance would require mitigation. Mitigation, in most cases the excavation of a site, is in essence destructive and therefore the impact can be viewed as high and as permanent.

 No sites, features or objects with cultural historic significance were identified in the study area.

6.2 Impact assessment

Impact analysis of cultural heritage resources under threat of the proposed development, are based on the present understanding of the development.

 As no sites, features or objects of cultural significance were identified in the study area, there would be no impact resulting from the proposed development.

7. IDENTIFICATION OF RISK SOURCES

A Heritage Impact Assessment is focused on two phases of a proposed development: **the construction** and **operation phases**. The following project actions may impact negatively on archaeological sites and other features of cultural importance. The actions are most likely to occur during the construction phase of a project.

Construction phase:

Possible Risks	Source of the risk
Actually identified risks	
- damage to sites	Construction work
Anticipated risks	
- looting of sites	Curious workers

Operation phase:

Possible Risks	Source of the risk		
Actually identified risks			
- damage to sites	Not keeping to management plans		
Anticipated risks			
- damage to sites	Unscheduled construction/developments		
- looting of sites	Visitors removing objects as keepsakes		

8. RECOMMENDED MANAGEMENT MEASURES

Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon them is permanent and non-reversible. Those resources that cannot be avoided and that are directly impacted by the development can be excavated/recorded and a management plan can be developed for future action. Those sites that are not impacted on can be written into the management plan, whence they can be avoided or cared for in the future.

8.1 Objectives

- Protection of archaeological, historical and any other site or land considered being of cultural value within the project boundary against vandalism, destruction and theft.
- The preservation and appropriate management of new discoveries in accordance with the National Heritage Resources Act (Act No. 25 of 1999), should these be discovered during construction.

8.2.1 Operation phase

General management objectives and commitments:

To avoid disturbing sites of heritage importance.

The following shall apply:

- Continued care should be taken to observe discovery of any sites of heritage significance during operation. Should any archaeological artifacts and palaeontological remains be exposed during operations, work on the area where the artefacts were found, shall cease immediately and the appropriate person shall be notified as soon as possible;
- Upon receipt of such notification, an Archaeologist or Palaeontologist shall investigate the site as soon as practicable. Acting upon advice from these specialists, the necessary actions shall be taken;
- Under no circumstances shall archaeological or palaeontological artefacts be removed, destroyed or interfered with by anyone on the site during operations; and

• The operator shall advise its workers of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51(1).

9. RECOMMENDATIONS

The aim of the survey was to locate, identify, evaluate and document sites, objects and features of cultural significance found within the boundaries of the area in which it is proposed to expand the Jahno Quarry.

Previous EMP's indicated the presence of graves on the site. All available resources and databases were accessed in order to determine origin and location of these graves. However, no information could be obtained. An intensive survey of the area identified in the original EMP's as the location of the graves, produced nothing. In fact, this area has been subjected to intensive mining activities.

Therefore, as no sites, features or artefacts of cultural significance were identified in the study area that would require the development plan to be changed, it is recommended that the proposed development can continue in the area, on condition of acceptance of the following recommendations:

• If archaeological sites are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made.

10. REFERENCES

10.1 Data bases

Chief Surveyor General

Environmental Potential Atlas, Department of Environmental Affairs and Tourism.

Heritage Atlas Database, Pretoria.

National Archives of South Africa

10.2 Literature

Acocks, J.P.H. 1975. *Veld Types of South Africa*. Memoirs of the Botanical Survey of South Africa, No. 40. Pretoria: Botanical Research Institute.

Nicholson, A. 2004. Environmental Management Programme Report, compiled for Walberer's Brickworks, Janho Quarry. Fairland: Umhlaba Environmental Consultants.

Nicholson, A. 2005. Further amendment to the Approved Environmental Management Programme, compiled for Walberer's Brickworks, Janho Quarry. Fairland: Umhlaba Environmental Consultants.

Nicholson, A. 2006. Amended Environmental Management Programme, compiled for Walberer's Brickworks, Janho Quarry. Fairland: Umhlaba Environmental Consultants.

10.3 Maps

1: 50 000 Topocadastral maps – 2527DD, 2627BB

APPENDIX 1: CONVENTIONS USED TO ASSESS THE IMPACT OF PROJECTS ON HERITAGE RESOURCES

Significance

According to the NHRA, Section 2(vi) the **significance** of a heritage sites and artefacts is determined by it aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technical value in relation to the uniqueness, condition of preservation and research potential. It must be kept in mind that the various aspects are not mutually exclusive, and that the evaluation of any site is done with reference to any number of these.

Matrix used for assessing the significance of each identified site/feature

A 10 a 1 1			
1. Historic value			
Is it important in the community, or pattern of history			
Does it have strong or special association with the life or we	ork of a pe	erson,	
group or organisation of importance in history			
Does it have significance relating to the history of slavery			
2. Aesthetic value			
It is important in exhibiting particular aesthetic characteristic	ics valued	by a	
community or cultural group			
3. Scientific value			
Does it have potential to yield information that will co	ontribute t	o an	
understanding of natural or cultural heritage			
Is it important in demonstrating a high degree of creati	ve or tech	nnical	
achievement at a			
particular period			
4. Social value			
Does it have strong or special association with a particular	r commun	ity or	
cultural group for social, cultural or spiritual reasons			
5. Rarity			
Does it possess uncommon, rare or endangered aspects of n	atural or cu	ıltural	
heritage			
6. Representivity			
Is it important in demonstrating the principal characteristics	of a part	icular	
class of natural or cultural places or objects			
Importance in demonstrating the principal characteristics			
landscapes or environments, the attributes of which iden	tify it as I	being	
characteristic of its class			
Importance in demonstrating the principal characteristics of			
(including way of life, philosophy, custom, process, land-use,			
or technique) in the environment of the nation, province, regio	n or locality		
7. Sphere of Significance	High	Medium	Low
International			
National			
Provincial			
Regional			
Local			
Specific community			
8. Significance rating of feature			•
1. Low			
2. Medium			
Provincial Regional Local Specific community 8. Significance rating of feature 1. Low 2. Medium			

Significance of impact:

- low where the impact will not have an influence on or require to be significantly

accommodated in the project design

- medium where the impact could have an influence which will require modification of

the project design or alternative mitigation

- high where it would have a "no-go" implication on the project regardless of any

mitigation

Certainty of prediction:

 Definite: More than 90% sure of a particular fact. Substantial supportive data to verify assessment

- Probable: More than 70% sure of a particular fact, or of the likelihood of that impact occurring
- Possible: Only more than 40% sure of a particular fact, or of the likelihood of an impact occurring
- Unsure: Less than 40% sure of a particular fact, or the likelihood of an impact occurring

Recommended management action:

For each impact, the recommended practically attainable mitigation actions which would result in a measurable reduction of the impact, must be identified. This is expressed according to the following:

- 1 = no further investigation/action necessary
- 2 = controlled sampling and/or mapping of the site necessary
- 3 = preserve site if possible, otherwise extensive salvage excavation and/or mapping necessary
- 4 = preserve site at all costs

Legal requirements:

Identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project, if mitigation is necessary.

APPENDIX 2. RELEVANT LEGISLATION

All archaeological and palaeontological sites, and meteorites are protected by the National Heritage Resources Act (Act no 25 of 1999) as stated in Section 35:

- (1) Subject to the provisions of section 8, the protection of archaeological and palaeontological sites and material and meteorites is the responsibility of a provincial heritage resources authority: Provided that the protection of any wreck in the territorial waters and the maritime cultural zone shall be the responsibility of SAHRA.
- (2) Subject to the provisions of subsection (8)(a), all archaeological objects, palaeontological material and meteorites are the property of the State. The responsible heritage authority must, on behalf of the State, at its discretion ensure that such objects are lodged with a museum or other public institution that has a collection policy acceptable to the heritage resources authority and may in so doing establish such terms and conditions as it sees fit for the conservation of such objects.
- (3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
- (4) No person may, without a permit issued by the responsible heritage resources authority-
 - (a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
 - (b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
 - (c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
 - (d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assist in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.

In terms of cemeteries and graves the following (Section 36):

- (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.
- (2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.
- (3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-
 - (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
 - (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
 - (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- (4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and reinterment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.

The National Heritage Resources Act (Act no 25 of 1999) stipulates the assessment criteria and grading of archaeological sites. The following categories are distinguished in Section 7 of the Act:

- **Grade I**: Heritage resources with qualities so exceptional that they are of special national significance;
- Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- **Grade III**: Other heritage resources worthy of conservation, and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3(3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.

Presenting archaeological sites as part of tourism attraction requires, in terms 44 of the Act, a Conservation Management Plan as well as a permit from SAHRA.

- (1) Heritage resources authorities and local authorities must, wherever appropriate, coordinate and promote the presentation and use of places of cultural significance and heritage resources which form part of the national estate and for which they are responsible in terms of section 5 for public enjoyment, education. research and tourism, including-
 - (a) the erection of explanatory plaques and interpretive facilities, including interpretive centres and visitor facilities;
 - (b) the training and provision of guides;
 - (c) the mounting of exhibitions;
 - (d) the erection of memorials; and
 - (e) any other means necessary for the effective presentation of the national estate.
- (2) Where a heritage resource which is formally protected in terms of Part I of this Chapter is to be presented, the person wishing to undertake such presentation must, at least 60 days prior to the institution of interpretive measures or manufacture of associated material, consult with the heritage resources authority which is responsible for the protection of such heritage resource regarding the contents of interpretive material or programmes.
- (3) A person may only erect a plaque or other permanent display or structure associated with such presentation in the vicinity of a place protected in terms of this Act in consultation with the heritage resources authority responsible for the protection of the place.

APPENDIX 3: SURVEY RESULTS

See Appendix 1 for an explanation of the conventions used in assessing the cultural remains.

Map datum used: Hartebeeshoek 94 (WGS84).

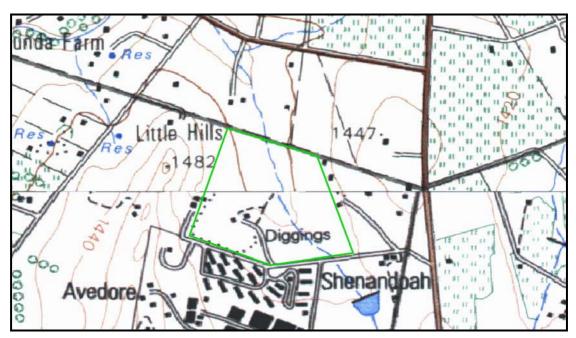


Fig. 2. The study area outlined in green.

(Maps 2527DD, 2627BB: Chief Directorate Survey and Mapping).

Sites identified: Nil

APPENDIX 4: ILLUSTRATIONS



Fig. 3. Aerial photograph of the site.

(Photo: Courtesy of Google Earth)





Fig. 4. Two views across the site.



Fig. 5. The area where the graves supposedly were, showing a deep excavation.