



**DEL F SAND (PTY) LTD: DEL F CULLINAN SAND MINE,  
BRANDBACH 471 JR, GAUTENG PROVINCE**

**Phase 1 Archaeological Impact Assessment Report**

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Compiled by N. Kruger



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## ARCHAEOLOGICAL IMPACT ASSESSMENT FOR THE DELF CULLINAN MINE ON PORTIONS 63 & 67 OF THE FARM BRANDBACH 471 JR, GAUTENG PROVINCE

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September 2011

### Conducted on behalf of:

Delf Sand (Pty) Ltd  
Ages Gauteng

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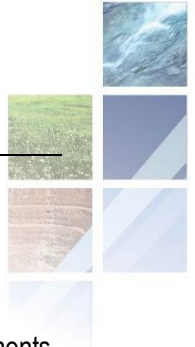
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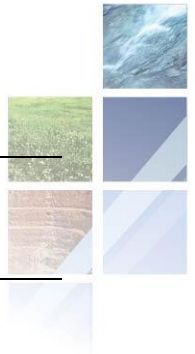
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AGES (Pty) Ltd promotes the conservation of sensitive archaeological and heritage resources and therefore uncompromisingly adheres to relevant Heritage Legislation (National Heritage Resources Act no. 25 of 1999, Human Tissue Act 65 of 1983 as amended, Removal of Graves and Dead Bodies Ordinance no. 7 of 1925, Excavations Ordinance no. 12 of 1980). In order to ensure best practices and ethics in the examination, conservation and mitigation of archaeological and heritage resources, AGES (Pty) follows the Minimum Standards: Archaeological and Palaeontological Components of Impact Assessment as set out by the South African Heritage Resources Agency (SAHRA) and the cultural resource management (CRM) section of the Association for South African Professional Archaeologists (ASAPA).



## NOTATIONS AND TERMS

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**Absolute dating:**

Absolute dating provides specific dates or range of dates expressed in years.

**Archaeology:**

The study of the human past through its material remains.

**Archaeological record:**

The archaeological record minimally includes all the material remains documented by archaeologists. More comprehensive definitions also include the record of culture history and everything written about the past by archaeologists.

**Artefact:**

Entities whose characteristics result or partially result from human activity. The shape and other characteristics of the artifact are not altered by removal of the surroundings in which they are discovered. In the southern African context examples of artefacts include potsherds, iron objects, stone tools, beads and hut remains.

**Assemblage:**

A group of artefacts recurring together at a particular time and place, and representing the sum of human activities.

**<sup>14</sup>C or radiocarbon dating:**

The <sup>14</sup>C method determines the absolute age of organic material by studying the radioactivity of carbon. It is reliable for objects not older than 70 000 years by means of isotopic enrichment. The method becomes increasingly inaccurate for samples younger than ±250 years.

**Ceramic Facies:**

In terms of the cultural representation of ceramics, a facies is denoted by a specific branch of a larger ceramic tradition. A number of ceramic facies thus constitute a ceramic tradition.

**Ceramic Tradition:**

In terms of the cultural representation of ceramics, a series of ceramic units constitutes as ceramic tradition.

**Context:**

An artefact's context usually consists of its immediate *matrix*, its *provenience* and its *association* with other artefacts. When found in *primary context*, the original artefact or structure was undisturbed by natural or human factors until excavation and if in *secondary context*, disturbance or displacement by later ecological action or human activities occurred.

**Culture:**

A contested term, "culture" could minimally be defined as the learned and shared things that people have, do and think.

**Cultural Heritage Resource:**

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

**Cultural landscape:**

A cultural landscape refers to a distinctive geographic area with cultural significance.

**Cultural Resource Management (CRM):**

A system of measures for safeguarding the archaeological heritage of a given area, generally applied within the framework of legislation designed to safeguard the past.

## Delf Cullinan Mine AIA Study

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### **Ecofact:**

Non artifactual material remains that has cultural relevance which provides information about past human activities. Examples would include remains or evidence of domesticated animals or plant species.

### **Excavation:**

The principal method of data acquisition in archaeology, involving the systematic uncovering of archaeological remains through the removal of the deposits of soil and the other material covering and accompanying it.

### **Feature:**

Non-portable artifacts, in other words artifacts that cannot be removed from their surroundings without destroying or altering their original form. Hearths, roads, and storage pits are examples of archaeological features

### **GIS:**

Geographic Information Systems are computer software that allows layering of various types of data to produce complex maps; useful for predicting site location and for representing the analysis of collected data within sites and across regions.

### **Historical archaeology:**

Primarily that aspect of archaeology which is complementary to history based on the study of written sources. In the South African context it concerns the recovery and interpretation of relics left in the ground in the course of Europe's discovery of South Africa, as well as the movements of the indigenous groups during, and after the "Great Scattering" of Bantu-speaking groups – known as the *mfecane* or *difaqane*.

### **Iron Age:**

Also known as "Farmer Period", the "Iron Age" is an archaeological term used to define a period associated with domesticated livestock and grains, metal working and ceramic manufacture.

### **Lithic:**

Stone tools or waste from stone tool manufacturing found in on archaeological sites.

### **Matrix:**

The material in which an artefact is situated (sediments such as sand, ashy soil, mud, water, etcetera). The matrix may be of natural origin or human-made.

### **Megalith:**

A large stone, often found in association with others and forming an alignment or monument, such as large stone statues.

### **Midden:**

Refuse that accumulates in a concentrated heap.

### **Microlith:**

A small stone tool, typically knapped of flint or chert, usually about three centimetres long or less.

### **Monolith:**

A geological feature such as a large rock, consisting of a single massive stone or rock, or a single piece of rock placed as, or within, a monument or site.

### **Oral Histories:**

The historical narratives, stories and traditions passed from generation to generation by word of mouth.

### **Pre-Phase 1 CRM Assessment:**

An initial pre-assessment (scoping) phase, where the specialist establishes the scope of the project and terms of reference for the developer.

### **Phase 1 CRM Assessment:**

An Impact Assessment which identifies archaeological and heritage sites, assesses their significance and comments on the impact of a given development on the sites. Recommendations for site mitigation or conservation are also made during this phase.

### **Phase 2 CRM Study:**

In-depth studies which could include major archaeological excavations, detailed site surveys and mapping / plans of sites, including

## Delf Cullinan Mine AIA Study

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historical / architectural structures and features. Alternatively, the sampling of sites by collecting material, small test pit excavations or auger sampling is required. Mitigation / Rescue involves planning the protection of significant sites or sampling through excavation or collection (in terms of a permit) at sites that may be lost as a result of a given development.

### Phase 3 CRM Measure:

A Heritage Site Management Plan (for heritage conservation), is required in rare cases where the site is so important that development will not be allowed and sometimes developers are encouraged to enhance the value of the sites retained on their properties with appropriate interpretive material or displays.

### Prehistoric archaeology:

That aspect of archaeology which concerns itself with the development of humans and their culture before the invention of writing. In South Africa, prehistoric archaeology comprises the study of the Early Stone Age, the Middle Stone Age and the greater part of the Later Stone Age and the Iron Age.

### Probabilistic Sampling:

A sampling strategy that is not biased by any person's judgment or opinion. Also known as statistical sampling, it includes systematic, random and stratified sampling strategies.

### Provenience

Provenience is the three-dimensional (horizontal and vertical) position in which artefacts are found. Fundamental to ascertaining the provenience of an artefact is *association*, the co-occurrence of an artefact with other archaeological remains; and *superposition*, the principle whereby artefacts in lower levels of a matrix were deposited before the artefacts found in the layers above them, and are therefore older.

### Random Sampling:

A probabilistic sampling strategy whereby randomly selected sample blocks in an area are surveyed. These are fixed by drawing coordinates of the sample blocks from a table of random numbers.

### Relative dating:

The process whereby the relative antiquity of sites and objects are determined by putting them in sequential order but not assigning specific dates.

### Remote Sensing:

The small or large-scale acquisition of information of an object or phenomenon, by the use of either recording or real-time sensing device(s) that is not in physical or intimate contact with the object (such as by way of aircraft, spacecraft or satellite). Here, ground-based geophysical methods such as Ground Penetrating Radar and Magnetometry are often used for archaeological imaging.

### Rock Art Research:

Rock art can be "decoded" in order to inform about cultural attributes of prehistoric societies, such as dress-code, hunting and food gathering, social behaviour, religious practice, gender issues and political issues.

### Sensitive:

Often refers to graves and burial sites although not necessarily a heritage place, as well as ideologically significant sites such as ritual / religious places. *Sensitive* may also refer to an entire landscape / area known for its significant heritage remains.

### Site (Archaeological):

A distinct spatial clustering of artefacts, features, structures, and organic and environmental remains, as the residue of human activity. These include surface sites, caves and rock shelters, larger open-air sites, sealed sites (deposits) and river deposits. Common functions of archaeological sites include living or habitation sites, kill sites, ceremonial sites, burial sites, trading, quarry, and art sites,

### Slag:

The material residue of smelting processes from metalworking.

### Stone Age:

An archaeological term used to define a period of stone tool use and manufacture.

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### Stratigraphy:

This principle examines and describes the observable layers of sediments and the arrangement of strata in deposits

### Stratified Sampling:

A probabilistic sampling strategy whereby a study area is divided into appropriate zones – often based on the probable location of archaeological areas, after which each zone is sampled at random.

### Systematic Sampling:

A probabilistic sampling strategy whereby a grid of sample blocks is set up over the survey area and each of these blocks is equally spaced and searched.

### Tradition:

Artefact types, assemblages of tools, architectural styles, economic practices or art styles that last longer than a phase and even a horizon are describe by the term *tradition*. A common example of this is the early Iron Age tradition of Southern Africa that originated  $\pm$  200 AD and came to an end at about 900 AD.

### Tuyère:

A ceramic blow-tube used in the process of iron smelting / reduction.

## LIST OF ABBREVIATIONS

Abbreviation	Description
ASAPA	Association for South African Professional Archaeologists
AIA	Archaeological Impact Assessment
BP	Before Present
BCE	Before Common Era
EIA	Early Iron Age (also Early Farmer Period)
EIA	Environmental Impact Assessment
EFP	Early Farmer Period (also Early Iron Age)
ESA	Earlier Stone Age
GIS	Geographic Information Systems
HIA	Heritage Impact Assessment
K2/Map	K2/Mapungubwe Period
LFP	Later Farmer Period (also Later Iron Age)
LIA	Later Iron Age (also Later Farmer Period)
LSA	Later Stone Age
MIA	Middle Iron Age (also Early later Farmer Period)
MRA	Mining Rights Application
MSA	Middle Stone Age
NHRA	National Heritage Resources Act No.25 of 1999, Section 35
SAHRA	South African Heritage Resources Association
YCE	Years before Common Era (Present)



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## 1 EXECUTIVE SUMMARY

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This report details the results of an Archaeological Impact Assessment (AIA) study of Portions 63 and 67 of the farm Brandbach 471JR in the Cullinan area, Gauteng Province. The study was requested by Delf Sand (Pty) Ltd for the development of a sand mine and related infrastructure. The report includes background information on the area's archaeology, its representation in southern Africa, and the history of the larger area under investigation, survey methodology and results as well as heritage legislation and conservation policies. A copy of the report will be supplied to the South African Heritage Resources Agency (SAHRA) and recommendations contained in this document will be reviewed in order to consider the conservation priority of sites located in the area.

A number of archaeological and historical sites occur on the Highveld around Bronkhorstspuit. In addition, the Brandbach conservancy is recognised in terms of a rich and varied cultural legacy. Two areas of archaeological potential were located during the AIA survey of Portions of the farm Brandbach, which primarily focused around areas proposed for the development mining infrastructure, covering about 350ha.

### ***Paleontological Remains***

No paleontological occurrences were observed in the study area.

### ***Stone Age Remains:***

No Stone Age occurrences were observed in the study area.

### ***Iron Age / Farmer Period Remains:***

A poorly preserved later Iron Age period stonewalled site was identified in the southern sector of the study area. The site consists of a large exterior stone wall enclosure with smaller wall structures positioned within the enclosure. As no archaeological deposits were observed on the surface and the site is poorly preserved, its scientific value is rated as of medium to low significance.

### ***Historical /Recent Remains***

No Historical / Colonial Period sites were documented in the study area.

### ***Graves***

Six graves occur in a small informal cemetery more or less in the centre of the study area. The graves, which are not marked with formal headstones, consist of rectangular stone heaps. A small section of stone walling with a clearly demarcated entrance occurs next to the graves. The cemetery probably dates to recent times, as the alignment of graves follow a Christian-Western burial style (east-west orientation), and plastic and glass funeral goods remain on some of the graves. The graves can possibly be attributed to the Mapai family who used to work on Brandbach for most of the 19<sup>th</sup> and 29<sup>th</sup> centuries. The burials are of high significance.

### ***Recommendations***

Considering the rich and diverse archaeological and historical landscape of the Highveld and specifically the eastern Magaliesberg around Brandbach, which covers human cultural development from the Stone Ages up to recent times, a careful watching brief monitoring process is recommended for mining developments at Brandbach. Even though the stone walled Iron Age site occurs outside areas demarcated for development, it is recommended that the site be carefully documented if impacts were to occur. A careful watch and brief

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monitoring process is recommended for any development activities in the area, as periphery features of the site such as cattle outposts, meeting areas and / or graves are likely to occur in the larger landscape around the site. Graves are generally graded as high significance resources and a conservation buffer zone of at least 50m should be maintained around the informal cemetery at Brandbach. In addition, the cemetery should be properly fenced and access control be implemented. However, should the cemetery or the proposed 50m buffer zone be impacted in any way by the planned sand mine, a full grave relocation and social consultation is recommended for all graves – as endorsed by relevant legislation. Should any subsurface paleontological / archaeological material be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately.

This report details the methodology, limitations and recommendations relevant to these heritage areas, as well as areas of proposed development. It should be noted that mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

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## 2 BACKGROUND

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### 2.1 Scope and Motivation

AGES (Pty) Ltd was commissioned by Delf Sand (Pty) Ltd for an Archaeological Impact Assessment (AIA) Study of demarcated areas on Portions 63 and 67 of the farm Brandbach 471JR, about 15km east of Cullinan, in the Gauteng Province where a sand mine is planned. The proposed development tentatively comprises infrastructure such as the mine, a processing plant and site offices. The rationale of the AIA study was to determine the presence of heritage resources such as archaeological and historical sites and features, graves and places of religious and cultural significance; to consider the impact of the proposed project on such heritage resources, and to submit appropriate recommendations with regard to the cultural resources management measures that may be required at affected sites / features.

### 2.2 Project Direction

AGES's expertise ensures that all projects be conducted to the highest ethical and professional standards and as archaeological specialist for AGES, Mr. Neels Kruger acted as field director for the AIA study. Mr Kruger is an accredited archaeologist and CRM Practitioner with the Association of South African Professional Archaeologists (ASAPA) and a Master's Degree candidate in archaeology at the University of Pretoria.

### 2.3 Terms of Reference

Environmental Impact Assessments (EIAs) should, in all cases, include the assessment of Heritage Resources. The heritage component of the EIA is provided for in the **National Environmental Management Act, (Act 107 of 1998)** and endorsed by section 38 of the **National Heritage Resources Act (NHRA - Act 25 of 1999)**. In addition, the NHRA protects all structures and features older than 60 years (see Section 34), archaeological sites and material (see Section 35) and graves as well as burial sites (see Section 36). The objective of this legislation is to enable and to facilitate developers to employ measures to limit the potentially negative effects that the development could have on heritage resources.

Based hereon, this proposed project draws on the following **terms of reference**:

- *Provide a detailed description of all archaeological artefacts, structures (including graves) and settlements, if any.*
- *Estimate the level of significance/importance of the archaeological remains within the area.*
- *Assess any possible impact on the archaeological and historical remains within the area emanating from the proposed development activities.*
- *Propose possible mitigation measures provided that such action is necessitated by the development.*
- *Liaise and consult with SAHRA.*

### 2.4 CRM: Legislation, Conservation and Heritage Management

The broad generic term *Cultural Heritage Resources* refers to any physical and spiritual property associated with past and present human use or occupation of the environment, cultural activities and history. The term includes sites, structures, places, natural features and material of palaeontological, archaeological, historical, aesthetic, scientific, architectural, religious, symbolic or traditional importance to specific individuals or groups, traditional systems of cultural practice, belief or social interaction.

#### 2.4.1 Legislation regarding archaeology and heritage sites

The SAHRA and their provincial offices aim to conserve and control the management, research, alteration and destruction of cultural resources of South Africa. It is therefore vitally important to adhere to heritage resource legislation at all times.

- *National Heritage Resources Act No 25 of 1999, section 35*

According to the National Heritage Resources Act of 1999 a historical site is “any identifiable building or part thereof, marker, milestone, gravestone, landmark or tell older than 60 years.” This clause is commonly known as the “60-years clause”. Buildings are amongst the most enduring features of human occupation, and this definition therefore includes all buildings older than 60 years, modern architecture as well as ruins, fortifications and Iron Age settlements. “Tell” refers to the evidence of human existence which is no longer above ground level, such as building foundations and buried remains of settlements (including artefacts).

The Act identifies heritage objects as:

- objects recovered from the soil or waters of South Africa including archaeological and palaeontological objects, meteorites and rare geological specimens
- visual art objects
- military objects
- numismatic objects
- objects of cultural and historical significance
- objects to which oral traditions are attached and which are associated with living heritage
- objects of scientific or technological interest
- any other prescribed category

With regards to activities and work on archaeological and heritage sites this Act states that:

*“No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit by the relevant provincial heritage resources authority.” (34. [1] 1999:58)*

and

*“No person may, without a permit issued by the responsible heritage resources authority-*

- destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;*
- destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;*
- 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*
- 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. (35. [4] 1999:58).”*

And:

*“No person may, without a permit issued by SAHRA or a provincial heritage resources agency-*

- (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;*
- (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) and excavation equipment, or any equipment which assists in the detection or recovery of metals (36. [3] 1999:60).”*

- *Human Tissue Act of 1983 and Ordinance on the Removal of Graves and Dead Bodies of 1925*

Graves 60 years or older are heritage resources and fall under the jurisdiction of both the National Heritage Resources Act and the Human Tissues Act of 1983. However, graves younger than 60 years are specifically protected by the Human Tissues Act (Act 65 of 1983) and the Ordinance on the Removal of Graves and Dead Bodies (Ordinance 7 of 1925) as well as any local and regional provisions, laws and by-laws protect. Such burial places also fall under the jurisdiction of the National Department of Health and the Provincial Health Departments. Approval for the exhumation and re-burial must be obtained from the relevant Provincial Member of the Executive Council (MEC) as well as the relevant Local Authorities.

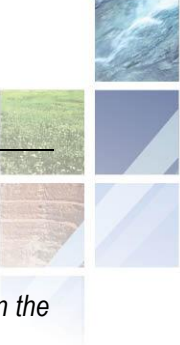
#### **2.4.2 Background to HIA and AIA Studies**

South Africa's unique and non-renewable archaeological and palaeontological heritage sites are 'Generally' protected in terms of the National Heritage Resources Act (Act No 25 of 1999, section 35) and may not be disturbed at all without a permit from the relevant heritage resources authority. Heritage sites are frequently threatened by development projects and both the environmental and heritage legislation require Heritage Impact Assessments (HIAs) & Archaeological Impact Assessments (AIAs) that identify all heritage resources in areas to be developed. Particularly, these assessments are required to make recommendations for protection or mitigation of the impact of the sites. HIAs and AIAs should be done by qualified professionals with adequate knowledge to (a) identify all heritage resources including archaeological and palaeontological sites that might occur in areas of development and (b) make recommendations for protection or mitigation of the impact on the sites.

The National Heritage Resources Act (Act No. 25 of 1999, section 38) provides guidelines for Cultural Resources Management and prospective developments:

*“38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as:*

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50 m in length;*

- 
- (c) any development or other activity which will change the character of a site:
- (i) exceeding 5 000 m<sup>2</sup> in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

*must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.”*

And:

*“The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection (2)(a): Provided that the following must be included:*

- (a) *The identification and mapping of all heritage resources in the area affected;*
- (b) *an assessment of the significance of such resources in terms of the heritage assessment criteria set out in section 6(2) or prescribed under section 7;*
- (c) *an assessment of the impact of the development on such heritage resources;*
- (d) *an evaluation of the impact of the development on heritage resources relative to the sustainable social and economic benefits to be derived from the development;*
- (e) *the results of consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources;*
- (f) *if heritage resources will be adversely affected by the proposed development, the consideration of alternatives; and*
- (g) *plans for mitigation of any adverse effects during and after the completion of the proposed development (38. [3] 1999:64).”*

Consequently, section 35 of the Act requires HIAs or AIAs to be done for such developments in order for all heritage resources, that is, all places or objects of aesthetics, architectural, historic, scientific, social, spiritual, linguistic or technological value or significance to be protected. Thus any assessment should make provision for the protection of all these heritage components, including archaeology, shipwrecks, battlefields, graves, and structures older than 60 years, living heritage, historical settlements, landscapes, geological sites, palaeontological sites and objects.

3 REGIONAL CONTEXT

3.1 Area Location

The proposed Delf Cullinan Sand Mine is situated at **S25°39'28.31" E28°38'24.25"** on Portions 63 and 67 of the farm Brandbach 471 JR in the Cullinan and Brandbach Conservancies. The site is located approximately 9km east of Cullinan and 6km north-west of Ekandustria (Bronkhorstspuit West). The R513 alternative route between Cullinan and Bronkhorstspuit passes to the south of the study area and Brandbach is accessed via the R460 regional road. Various smaller dirt roads intersect the study area, connecting the numerous farmsteads in the area.

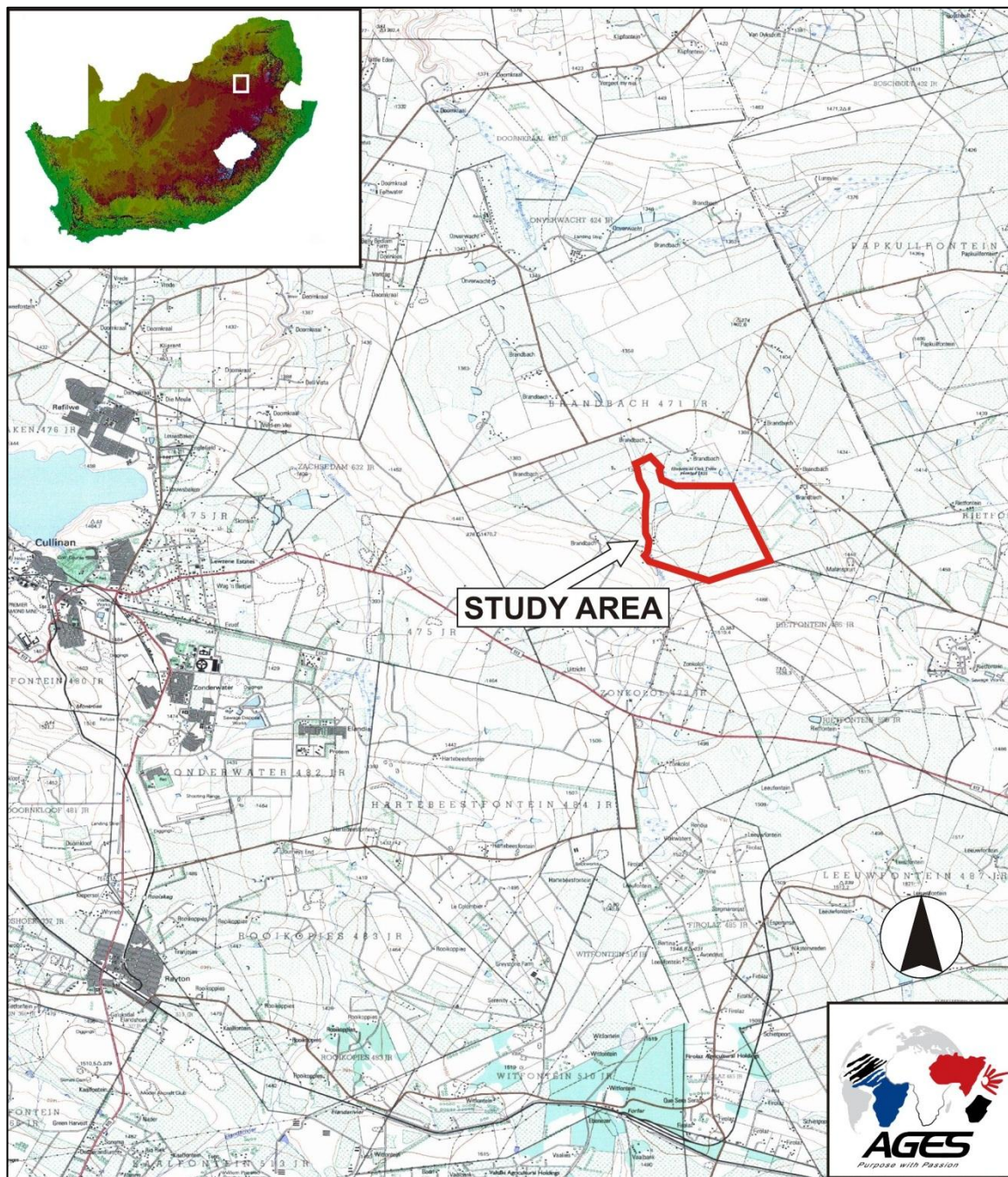


Figure 3-1: 1:50 00 Map representation of the Delf Cullinan Sand Mining area (2528DA).



### 3.2 Area Description: Receiving Environment

The town of Bronkhorstspuit is located about 50km east of Pretoria on the border of Gauteng and Mpumalanga at an altitude of 1370 m above sea level. It occurs to the extreme north of the grassland biome in South Africa. Acocks (1988) recognised the vegetation type as Bankenveld, and more specifically the Rand Highveld Grassland. The Bankenveld vegetation type consists of diverse plant communities such as forest in sheltered ravines, woodland, grassland and wetlands. The Masokololo River, a tributary to the Elands River forms the western periphery of the study area and a smaller tributary, the Malanspruit flows through the area to the north east. The area's geology is characterised by formations of the Waterberg Group overlain by Karoo sediments.



Figure 3-2: General surroundings at Brandbach, looking North West.

### 3.3 Site Description

The area demarcated for further sand mining at Brandbach covers a surface area of more or less 50ha, directly south of a wetland area hydrated by the Masokololo River to the west, and a small tributary – the Malanspruit - to the east. The site is bordered by the historical Brandbach farmstead to the north and a series of smaller hills to the south (see Figure 3-3). A single farm house occurs on the study area.

The AIA survey of Brandbach focused around the following areas (see Figure 3-3):

- **Resource Mining Area**
- **Mine Production Plant**
- **Roads and other Infrastructure**

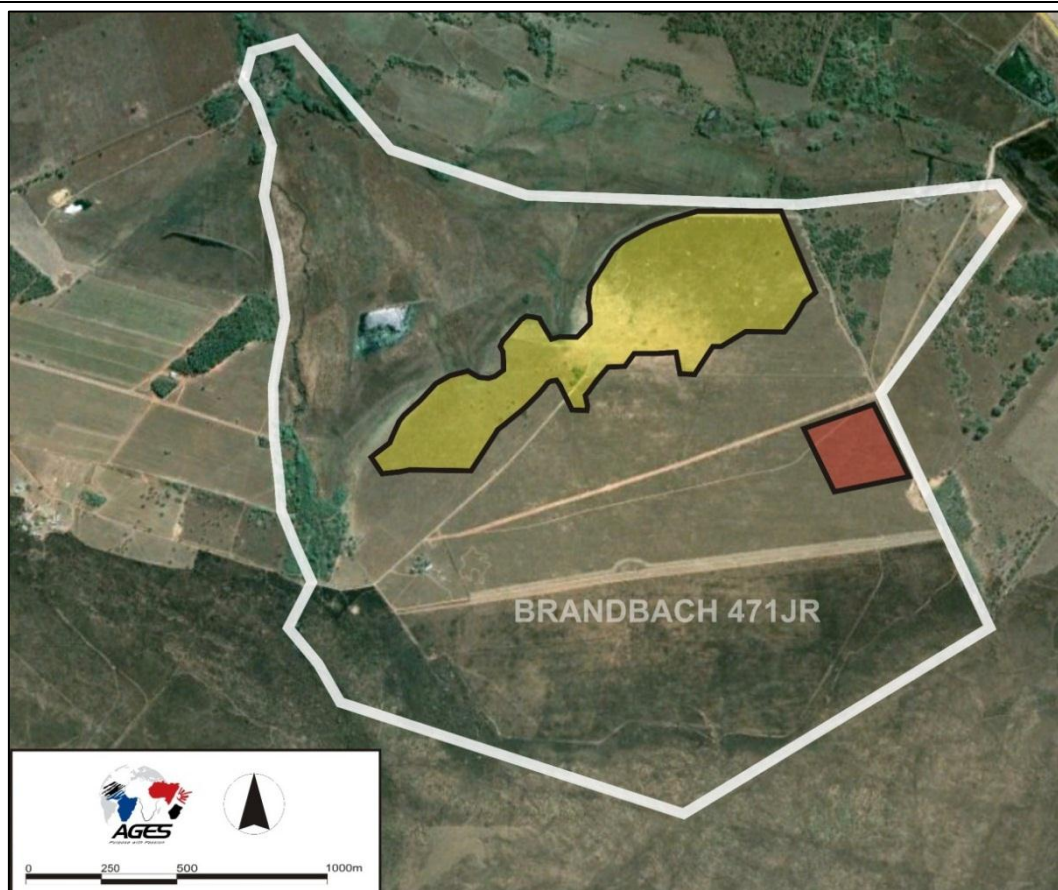


Figure 3-3: Regional setting of the Delf Cullinan mining area, indicating proposed infrastructure development discussed in the text: resources mining area (yellow) and mine production plant (red).

## 4 METHOD OF ENQUIRY

### 4.1 Sources of Information

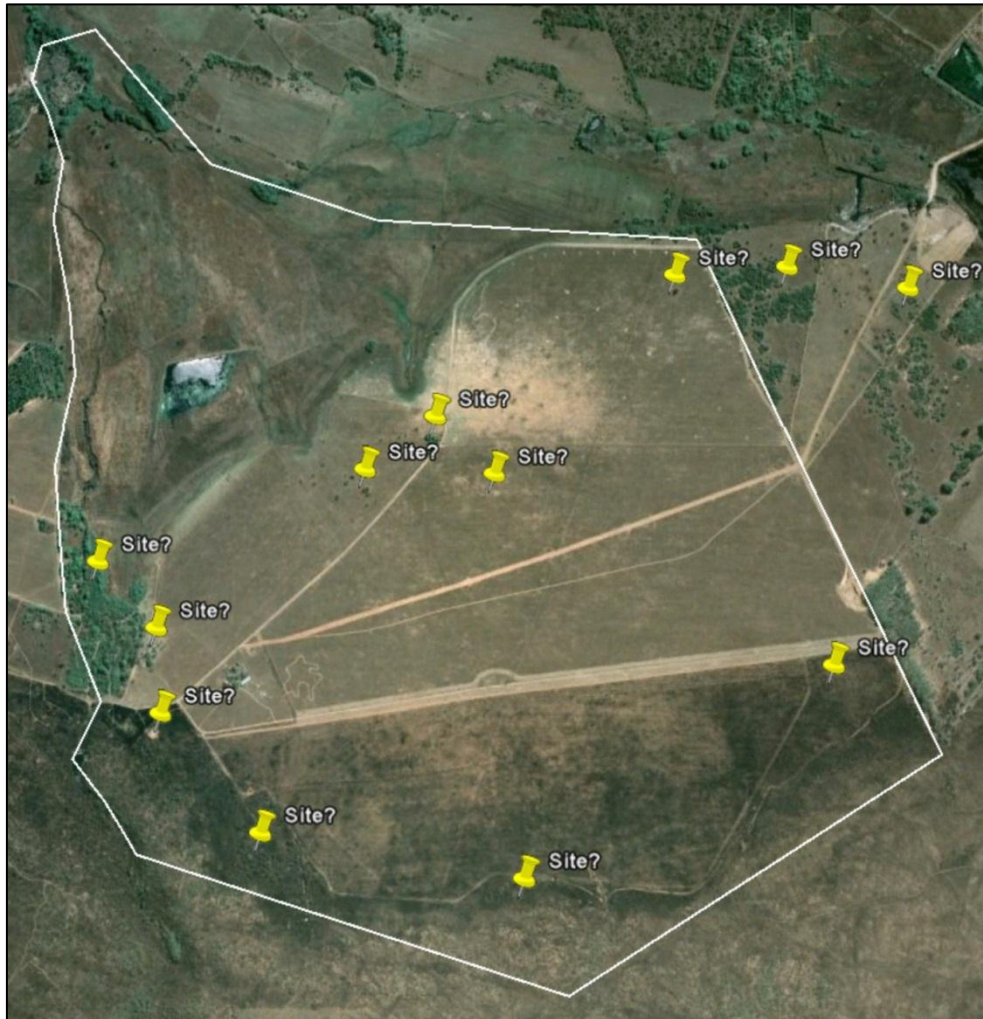
#### 4.1.1 Desktop Study

A desktop study was prepared in order to contextualize the proposed project within a larger historical milieu. The study focused on relevant previous studies, archaeological and archival sources, aerial photographs, historical maps and local histories, all pertaining to Brandbach area and the larger landscape of this section of the Highveld.

#### 4.1.2 Aerial Representations and Survey

Aerial photography is often employed to locate and study archaeological sites, particularly where larger scale area surveys are performed. This method was applied to aid the survey of the Brandbach property, where contour lines of elevations, depressions, variation in vegetation, soil marks and landmarks were examined. Specific attention was given to shadow sites (shadows of walls or earthworks which are visible early or late in the day), crop mark sites (crop mark sites are visible because disturbances beneath crops cause variations in their height, vigour and type) and soil marks (e.g. differently coloured or textured soil (soil marks) might indicate ploughed-out burial mounds). Attention was also given to moisture differences, as prolonged dampening of soil as a result of precipitation frequently occurs over walls or embankments. By superimposing high frequency aerial

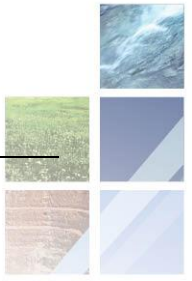
photographs with images generated with Google Earth, potential sensitive areas were subsequently identified (see Figure 4-1). These areas served as referenced points from where further transect surveys were carried out.



**Figure 4-1: Aerial representation of the study area, indicating areas identified as possible archaeological sites / disturbances prior to site survey.**

#### **4.1.3 Field Survey**

Archaeological survey implies the systematic procedure of the identification of archaeological sites. An archaeological survey of Brandbach, more specifically areas to be impacted by the planned development (i.e. mine and process plant), was done by means of a systematic pedestrian survey in accordance with standard archaeological practise by which heritage resources are observed and documented. In order to sample surface areas systematically and to ensure a high probability of site recording, transect grids in a frequency of between 20m and 50m were digitally superimposed on maps of the area. These transect lines were applied as guide for the pedestrian survey which focused around potentially sensitive areas identified during the aerial survey (see Figure 4-1). Walking along the transect system with a Garmin E-trex Legend GPS, objects and structures of archaeological / heritage value were recorded and photographed with a Canon 450D Digital camera. As most archaeological material occur in single or multiple stratified layers beneath the soil surface, special attention was given to disturbances, both man-made such as roads and clearings, as well as those made by natural agents such as burrowing animals and erosion.



## 4.2 Limitations

### 4.2.1 Access

Access to Brandbach is obtained from the R460 regional road through the farm entrance to the eastern portion of the property. On site, smaller farm service roads provided access to the study areas and no access constraints were encountered.

### 4.2.2 Visibility

The surrounding vegetation at the study area is mostly comprised out of mixed grasslands and wetland vegetation. The general visibility at the time of the survey (September 2011) was high in grassland areas (see Figure 4-2 to Figure 4-5), and moderate to low in densely overgrown wetland vegetation areas to the east of the study area (see Figure 4-6). In single cases during the survey sub-surface inspection was possible, particularly in excavation trenches and erosion gullies. Where applied, this revealed no archaeological deposits (see Figure 4-7).



Figure 4-2: View of the general surroundings in the study area, looking west.

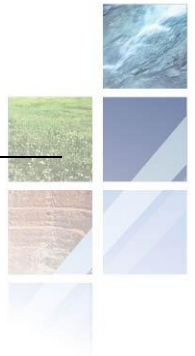


Figure 4-3: View of the general surroundings looking onto the small ridge that forms the southern boundary of the study area.



Figure 4-4: View of the general surroundings in the study area, looking south.

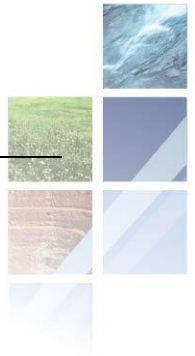


Figure 4-5: View of the northern portion of the study area, with the wetland visible in the surroundings.



Figure 4-6: View of dense vegetation to the extreme east of the study area.



Figure 4-7: Sub-surface deposits exposed by past excavations.

#### 4.2.3 Constraints

The pedestrian site survey focused around areas tentatively identified as sensitive (i.e. along drainage lines and those noted during the aerial survey) as well as zones to be directly impacted by future infrastructure (sites identified for the mine and production plant). No major constraints were encountered during the survey; except for dense vegetation to the extreme east of the study area where pedestrian access was difficult and low visibility somewhat hindered the site survey (e.g. Figure 4-6). Maintaining due cognisance of the integrity and accuracy of the archaeological survey, it should be stated that the heritage resources identified during the study do not necessarily represent *all* the heritage resources present on the property. The subterranean nature of some archaeological sites, dense vegetation cover and visibility constraints sometimes distort heritage representations and any additional heritage resources located during consequent development phases must be reported to the Heritage Resources Authority or an archaeological specialist.

## 5 ARCHAEO-HISTORICAL CONTEXT

### 5.1 The archaeology of Southern Africa

Archaeology in southern Africa is typically divided into two main fields of study, the **Stone Age** and the **Iron Age** or **Farmer Period**. The following table gives a concise outline of the chronological sequence of periods in Southern African history:

Period	Epoch	Associated cultural groups	Typical Material Expressions
Early Stone Age 2.5m – 250 000 YCE	Pleistocene	Early Hominins: <i>Australopithecines</i> <i>Homo habilis</i> <i>Homo erectus</i>	Typically large stone tools such as hand axes, choppers and cleavers.
Middle Stone Age 250 000 – 25 000 YCE	Pleistocene	First <i>Homo sapiens</i> species	Typically smaller stone tools such as scrapers, blades and points.

## Delf Cullinan Mine AIA Study

Late Stone Age 20 000 BC – present	Pleistocene / Holocene	<i>Homo sapiens sapiens</i> including San people	Typically small to minute stone tools such as arrow heads, points and bladelets.
Early Iron Age / Early Farmer Period 300 – 900 AD	Holocene	First Bantu-speaking groups	Typically distinct ceramics, bead ware, iron objects, grinding stones.
Middle Iron Age (Mapungubwe / K2) / early Later Farmer Period 900 – 1350 AD	Holocene	Bantu-speaking groups, ancestors of present-day groups	Typically distinct ceramics, bead ware and iron / gold / copper objects, trade goods and grinding stones.
Late Iron Age / Later Farmer Period 1400 AD -1850 AD	Holocene	Various Bantu-speaking groups including Venda, Thonga, Sotho-Tswana and Zulu	Distinct ceramics, grinding stones, iron objects, trade objects, remains of iron smelting activities including iron smelting furnace, iron slag and residue as well as iron ore.
Historical / Colonial Period ±1850 AD – present	Holocene	Various Bantu-speaking groups as well as European farmers, settlers and explorers	Remains of historical structures e.g. homestead, missionary schools etc. as well as, glass, porcelain, metal and ceramics.

### 5.1.1 The Stone Ages

#### - The Earlier Stone Age (ESA)

Earlier Stone Age deposits typically occur on the flood-plains of perennial rivers and may date to between 2 million and 250 000 years ago. These ESA open sites sometimes contain stone tool scatters and manufacturing debris ranging from pebble tool choppers to core tools such as handaxes and cleavers. These stone tools were made by the earliest hominins. These groups seldom actively hunted and relied heavily on the opportunistic scavenging of meat from carnivore kill sites.

#### - The Middle Stone Age (MSA)

The majority of Middle Stone Age (MSA) sites occur on flood plains and sometimes in caves and rock shelters. Sites usually consist of large concentrations of knapped stone flakes such as scrapers, points and blades and associated manufacturing debris. Tools may have been hafted but organic materials, such as those used in hafting, seldom remain preserved in the archaeological record. Limited drive-hunting activities are also associated with the MSA.

#### - The Later Stone Age (LSA)

Sites dating to the LSA are better preserved in rock shelters, although open sites with scatters of mainly stone tools can occur. Well-protected deposits in shelters allow for stable conditions that result in the preservation of organic materials such as wood, bone, hearths, ostrich eggshell beads and even bedding material. By using San (Bushman) ethnographic data a better understanding of this period is possible. South African rock art is also associated with the LSA.

### 5.1.2 The Iron Age (Farmer Period)

#### - Early Iron Age (Early Farming Communities)

The Early Iron Age (also Early Farmer Period) marks the movement of Bantu speaking farming communities into South Africa at around 200 A.D. These groups were agro-pastoralists that settled in the vicinity of water in order to provide subsistence for their cattle and crops. Artefact evidence from Early Farmer Period sites is mostly found in the form of ceramic assemblages and the origins and archaeological identities of this period are largely based upon ceramic typologies and sequences, where diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. Early Farmer Period ceramic traditions are classified by some scholars into different “streams” or trends in pot types and decoration that, over time emerged in southern Africa. These “streams” are identified as the Kwale Branch (east), the Nkope Branch (central) and the



Kalundu Branch (west). More specifically, in the northern regions of South Africa at least three settlement phases have been distinguished for prehistoric Bantu-speaking agropastoralists. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations, and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. Early Farmer Period ceramics typically display features such as large and prominent inverted rims, large neck areas and fine elaborate decorations. The Early Iron Age continued up to the end of the first millennium AD.

- **Middle Iron Age / K2 Mapungubwe Period (early Later Farming Communities)**

The onset of the middle Iron Age dates back to  $\pm 900$  AD, a period more commonly known as the Mapungubwe / K2 phase. These names refer to the well known archaeological sites that are today the pinnacle of South Africa's Iron Age heritage. The inhabitants of K2 and Mapungubwe, situated on the banks of the Limpopo, were agriculturalists and pastoralists and were engaged in extensive trade activities with local and foreign traders. Although the identity of this Bantu-speaking group remains a point of contestation, the Mapungubwe people were the first state-organized society southern Africa has known. A considerable amount of golden objects, ivory, beads (glass and gold), trade goods and clay figurines as well as large amounts of potsherds were found at these sites and also appear in sites dating back to this phase of the Iron Age. Ceramics of this tradition take the form of beakers with upright sides and decorations around the base (K2) and shallow-shouldered bowls with decorations as well as globular pots with long necks (Mapungubwe). The site of Mapungubwe was deserted at around 1250 AD and this also marks the relative conclusion of this phase of the Iron Age.

- **Later Iron Age (Later Farming Communities)**

The late Iron Age of southern Africa marks the grouping of Bantu speaking groups into different cultural units. It also signals one of the most influential events of the second millennium AD in southern Africa, the difaqane. The difaqane (also known as "the scattering") brought about a dramatic and sudden ending to centuries of stable society in southern Africa. Reasons for this change was essentially the first penetration of the southern African interior by Portuguese traders, military conquests by various Bantu speaking groups primarily the ambitious Zulu King Shaka and the beginning of industrial developments in South Africa. Different cultural groups were scattered over large areas of the interior. These groups conveyed with them their customs that in the archaeological record manifest in ceramics, beads and other artefacts. This means that distinct pottery typologies can be found in the different late Iron Age groups of South Africa.

### **5.1.3 Historical and Colonial Times and Recent History:**

The Historical period in southern Africa encompass the course of Europe's discovery of South Africa and the spreading of European settlements along the East Coast and subsequently into the interior. In addition, the formation stages of this period are marked by the large scale movements of various Bantu-speaking groups in the interior of South Africa, which profoundly influenced the course of European settlement. Finally, the final retreat of the San and Khoekhoen groups into their present-day living areas also occurred in the Historical period in southern Africa.

## 6 RESULTS: ARCHAEOLOGICAL SURVEY

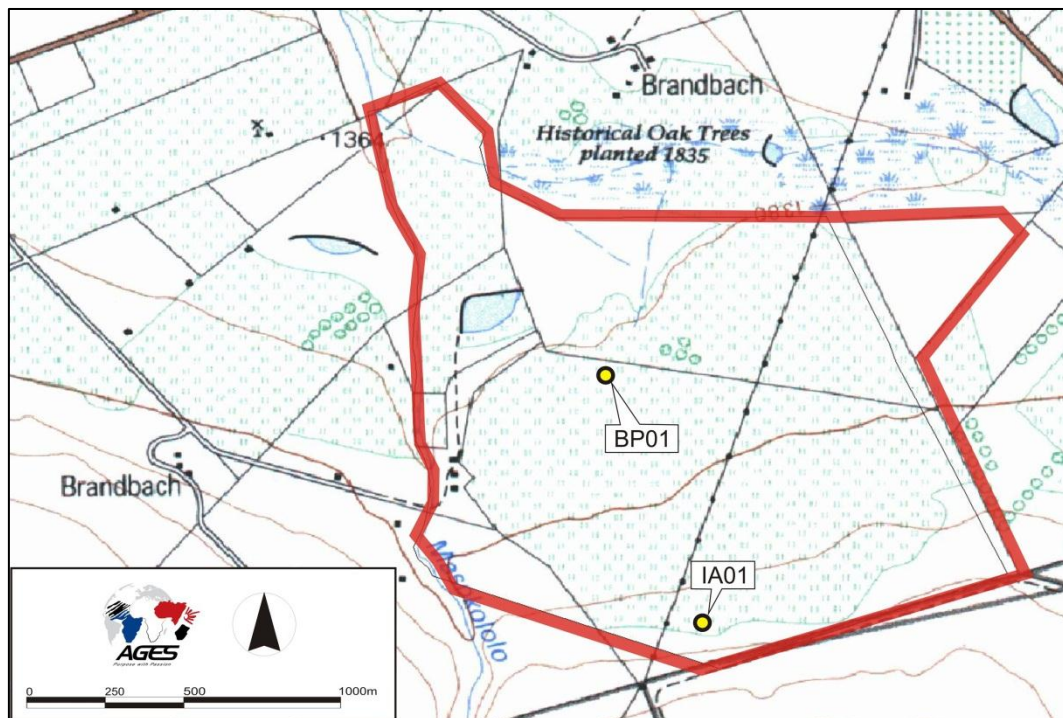


Figure 6-1: Map of the study area, indicating the locations of sites of interest discussed in the text.

### 6.1 The Stone Age

No Stone Age occurrences were observed in the study area.

### 6.2 The Iron Age (Farmer Period)

- **Site IA01 (S25°40'04.56" E28°38'18.99"): Iron Age stone walled site**

A small later Iron Age stone walled site occurs on the foothills of the stone ridge to the southern border of the study area. The collapsed walling, which consist out of an exterior periphery wall with smaller wall sections within the enclosure, extends for about 50m across the foothills. Entrances as well as monoliths are visible in places in the ruined walling. No material culture or archaeological deposits were found in association with the walling which might imply a brief occupation of the site. It is not possible to ascertain an exact temporality for the structures due to the general absence material culture at the site. However, the site might be attributed to Tswana and Ndebele speakers who settled across the Magaliesberg, Pienaars River and larger Highveld landscape during the later Iron Age (see Section 6.6).

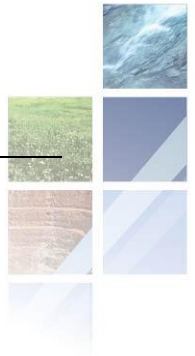


Figure 6-2: Aerial representation of Site IA01, positions of collapsed stone structures indicated with dashed white lines.



Figure 6-3: Collapsed stone wall enclosure and entrance at Site IA01.

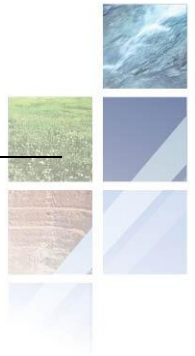


Figure 6-4: General surroundings at Site IA01 with collapsed stone walling visible.



Figure 6-5: Collapsed stone walling at Site IA01, note monolith top right on the image.



### 6.3 Historical / Colonial Period and recent times

No Historical / Colonial Period sites were documented in the study area.

### 6.4 Graves

- **Site BP01 (S25°39'30.95" E28°38'05.89"):** Small informal cemetery and stone walled enclosure.

A small informal cemetery occurs more or less in the central portion of the study area. Six graves with rectangular heaps of stone as grave dressing bearing no marked headstones are situated next to a section of stone walling under *Euphorbia* and *Acacia* trees. Two of the graves (G3 and G4) are fenced off with partially intact wire (refer to Figure 6-6). The cemetery probably dates to recent times, as the alignment of the graves follows a Christian-Western burial style (east-west orientation), and plastic and glass funeral goods remain on some of the graves. A small section of stone walling with a clearly demarcated entrance occurs next to the graves. Small ancestral farm cemeteries, belonging to farmer families and Black farm workers occur on almost every farm in the area. A family cemetery of the Malan family, who were some of the first farmers to settle in the area in the mid-nineteenth century, exists at the historical Brandbach farmstead, north of the study area. It is possible that the graves located during the survey are those of farm workers, more specifically the Mapaai family who were employed by the Malan family at Brandbach for most of the history of the farm (Kusel 2003).

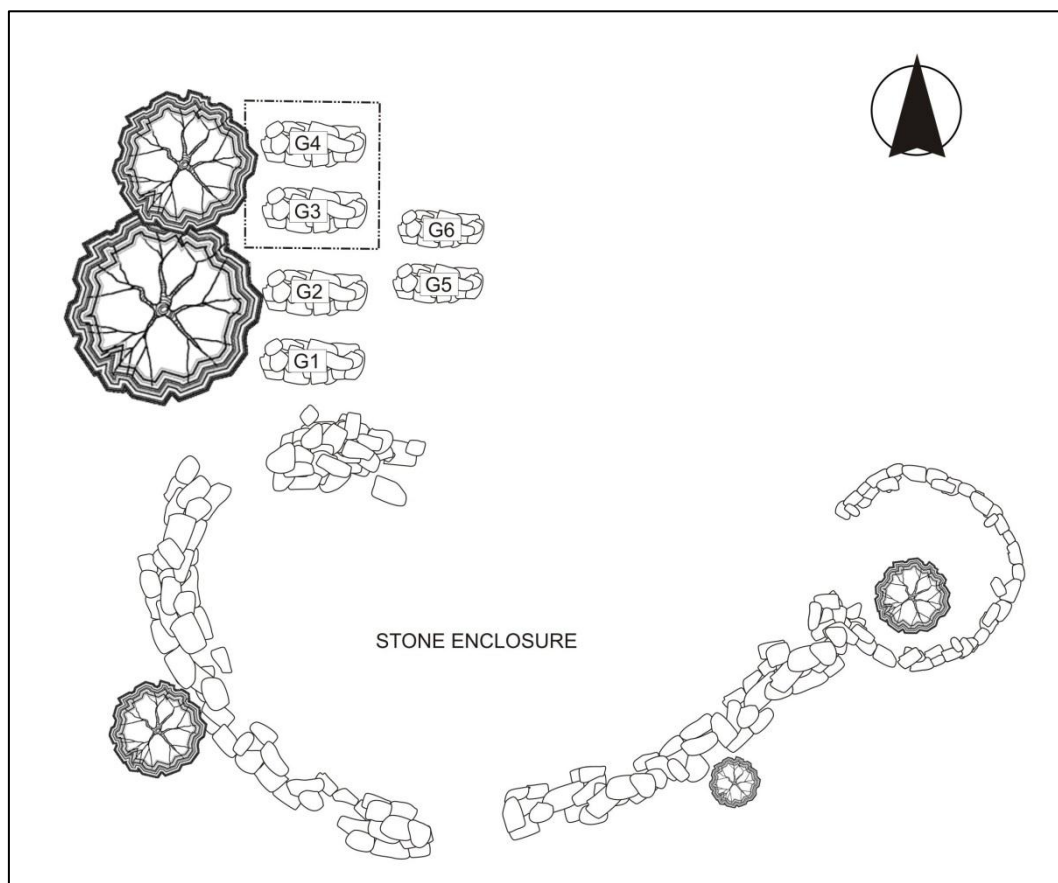


Figure 6-6: Map of site Site BP01, indicating relative positions of graves and stone enclosure (not to scale).

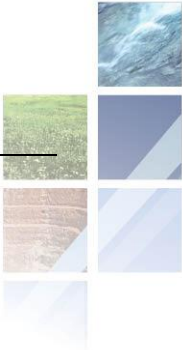


Figure 6-7: Site BP01 with stone enclosure to the left, the graves occur under large *Acacia* and *Euphorbia* trees to the right. .

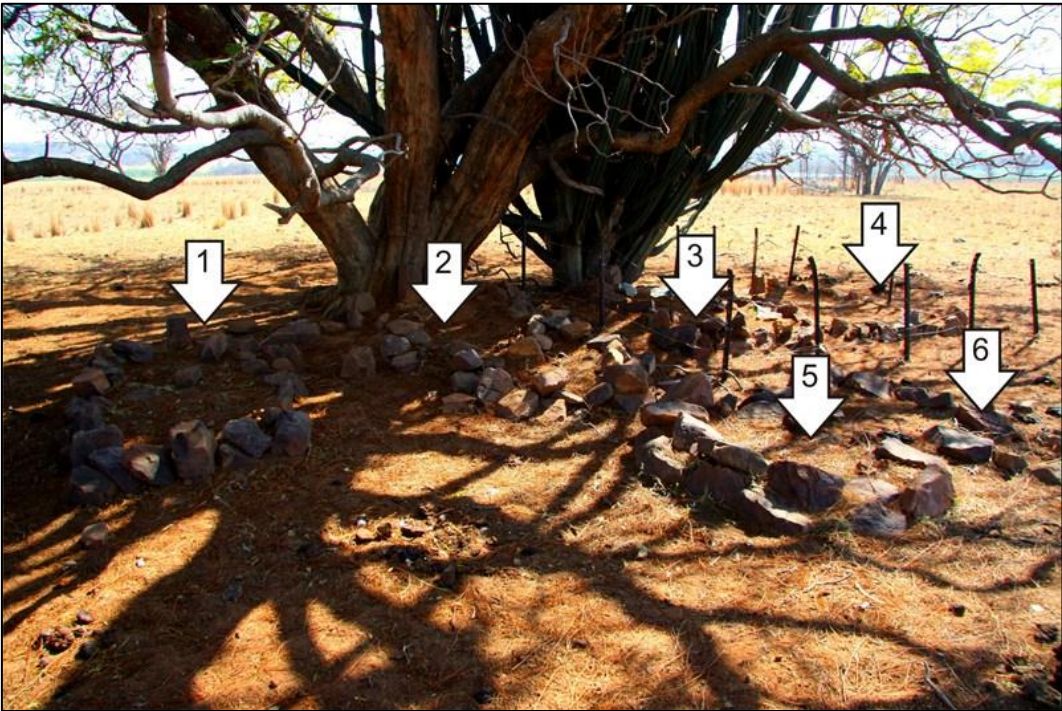


Figure 6-8: Situation of graves at Site BP01 (refer to Figure 6-6).

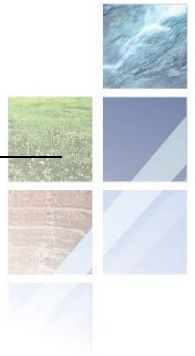


Figure 6-9: Grave dressing and funeral goods visible on Grave 3 at site BP01.

## 6.5 Other: Palaeontology

No paleontological occurrences were observed in the study area.

## 6.6 Discussion: Brandbach Regional History

The cultural landscape of the eastern Gauteng area encompasses a period of time that spans millions of years, covering human cultural development from the Stone Ages up to recent times. It depicts the interaction between the first humans and their adaptation and utilization to the environment, the migration of people, technological advances, warfare and contact and conflict. Contained in its archaeology are traces of conquests by Bantu-speakers, Europeans and British imperialism encompassing the struggle for land, resources and political power.

### 6.6.1 Early History: Stone Age

The Highveld areas of Gauteng were inhabited by humans since the Earlier Stone Age (ESA) times and stone tools dating to this period, typically found in the vicinity of watercourses, are abundantly scattered in the landscape. A significant ESA site has been documented on the farm Kaalfontein 366JR near the Willem Prinsloo Agricultural Museum where an Earlier Stone Age habitation site occurs about 1m sub-surface. The site yielded some of the oldest and largest Stone Age implements found in South Africa. The Middle Stone Age (MSA) marked the occupation of formerly unoccupied areas on the Highveld near water sources and tools belonging to this period mostly occur in the open or in erosion dongas. Later Stone Age (LSA) people displayed advanced technologies and therefore occupied larger and more diverse environments. Most LSA sites are found in

association with rock shelters and caves with material found across the Magaliesberg, to the north and east of Mamelodi and scattered throughout Pretoria's surroundings.

### **6.6.2 Early History: Iron Age**

Because of their specific technology and economy, Iron Age people preferred to settle on the alluvial soils near rivers for agricultural purposes and other resources. Remains of Early Iron Age occupation on the Highveld is scarce, with isolated sites occurring in the Magaliesberg, e.g. at Broederstroom. Large scale occupation of the larger Gauteng area by Bantu speaking farming communities occurred only in the second millennium AD. The 16<sup>th</sup> century was marked by a warmer and wetter climate, providing conditions favourable for Later Iron Age (LIA) farmer occupation in areas in the Witwatersrand, the Free State and the Mpumalanga escarpment. This, in turn resulted in increased food production with expanding populations on the central Highveld by the 19<sup>th</sup> century. Due to ever expanding territories and resulting conflict situations these Later Iron Age farmers preferred protective mountain slopes close to areas fit for cattle grazing. A number of Later Iron Age stone-walled archaeological sites, conventionally associated with Tswana and Ndebele speakers occur, in amongst other areas, across the Pienaars River around Wallmannsthal, Roodeplaat dam and southwards across the N4 Highway. Large concentration of Later Iron Age sites in the larger Cullinan area have been documented on the farms Downbern 494JR, Elandshoek 337JR, Leeuwkloof 258 JR, the Windybrow Game Farm and Buffelskloof 281JR.

### **6.6.3 Early History & Ethno-history**

*It should be noted that terms such as "Nguni", "Sotho", "Venda" and others refer to broad and comprehensive language groups that demonstrated similarities in their origins and language. It does not imply that these Nguni / Sotho groups were homogeneous and static; they rather moved through the landscape and influenced each other in continuous processes marked by cultural fluidity.*

Whereas it is impossible to attribute any living group of people to Early Iron Age communities, ethnographic evidence enables us to identify some of the groups of people that entered the region in Pre-colonial times and are currently settled in the larger region. Ethnographers generally divide major Bantu-speaking groups of southern Africa into two broad linguistic groups, the Nguni and the Sotho with smaller subdivisions under these two main groups. Nguni groups were found in the eastern parts of the interior of South Africa and can be divided into the northern Nguni and the southern Nguni. The various Zulu and Swazi groups were generally associated with the northern Nguni whereas the southern Nguni comprised the Xhosa, Mpondo, Thembu and Mpondomise groups. The same geographically based divisions exist among Sotho groups where, under the western Sotho (or Tswana), groups such as the Rolong, Hurutshe, Kwena, Fokeng and Kgatla are found. The northern Sotho included the Pedi and amalgamation of smaller groups united to become the southern Sotho group or the Basutho. Other smaller language groups such as the Venda, Lemba and Tshonga Shangana transpired outside these major entities but as time progressed they were, however to lesser or greater extent influenced and absorbed by neighbouring groups. The Highveld areas of Gauteng and Mpumalanga were occupied during the last 500 years mainly by Ndebele and Pedi (Kgatla) groups. These Ndebele groups originated from the Hlubi, a small split group that moved to the north-eastern parts of the Transvaal where they became known as the Transvaal Ndebele (not to be confused with the Ndebele of Mzilikazi). Ndebele groups settled in areas surrounding present-day Pretoria, at Kwa Maza near present-day Stoffberg, at Polokwane and Modimole and across large parts of Mpumalanga. The Kgatla, a Pedi group was established at the end of the 15<sup>th</sup> century by chief Mokgatla, who broke away from the Hurutshe group to settle in the Witwatersrand area. The Kgatla resided in an expansive area that included present-day Pretoria, the surroundings of the Magaliesberg and areas around



present-day Brits, Rustenburg, Modimolle and Warmbaths as well as the Pilansberg area. Isolated Kgatla communities also settled in the surroundings of Lydenburg, Middelburg, Bronkhorstspuit and the Soutpansberg.

The Highveld landscape can broadly be associated with, among others, the Manala Ndebele, who occupied areas to the east of Pretoria. However, the group were raided on a regular basis during Mzilikazi's presence in the Pretoria region between 1822 and 1825. In an act of retaliation, Sibindi (Manala) and Magodongo (Ndzundza) planned a joint attack on Mzilikazi but lost the battle and the Manala Ndebele were scattered throughout the area.

#### **6.6.4 Later History: The Colonial Period**

For centuries the area east of Pretoria proved to be ideal farmland because of its water richness and the first white settlers trekked into this area during the early part of the 19th century. Specifically Lucas Bronkhorst and the Erasmus brothers occupied stretches of land surrounding the area that was later to become Pretoria. The first farms in the areas were registered at around 1850 and from the onset farmers practiced mixed farming. Most farmers in the region had at least two farms: a Highveld (summer) and a Bushveld (winter) farm. The farmers would move their cattle and other animals between winter and summer grazing; a practise that later manifested in place names in the area such as Rust de Winter and Winterfelt. The Berlin Mission Society established a mission station at Wallmannsthal in 1869 and the first missionary to serve in this area was Mr Grünberger. The mission station became an important meeting place for displaced Tswana and Ndebele groups.

Possibly the most prominent colonial remnants on the Highveld and in Mpumalanga can be attributed to the South African War or the Anglo-Boer War (1899-1902). The various battles and skirmishes resulting from this influential conflict left a legacy of heritage sites scattered across the Highveld where fortifications, war cemeteries and battlefields still remain. Of note is the Battle of Donkerhoek (also the Battle of Diamond Hill) where the last conventional battle of the Anglo-Boer War took place. During the final stages of the war, concentration camps were erected for Boer women and children as well as for black farm workers. Such a camp for farm labourers were placed east of Pienaarspoort at the Van der Merwe railway halt on the farm Elandschoek (337JR) as well as at Elands River on the farm Kaalfontein.

#### **6.6.5 Brandbach during Historical times.**

After Mzilikazi's defeat of Manala, in the 1820's (see section 6.6.3 *Early History and Ethno-history*), the water rich Magaliesberg region became a favourable settlement area for European farmers who arrived in the Highveld area in the mid-Nineteenth Century. The first farmers settled in the area in the 1840's and by 1850 the first farms were registered. The farm Brandbach 471JR was first occupied during this time by the Malan family. Incidentally, an alley of Oak trees, dated to 1835 appears on the 1:50 000 map of the area (however, the 1835 date for the planting of the trees is probably not correct). The Brandbach farmstead remains to this day but the Oak trees were destroyed by fire in recent years (see Figure 6-10). Farming in South Africa has always relied heavily on informal labour practise and after the displacement of many Bantu speaking groups in the 19<sup>th</sup> century, many families found refuge on European farms. These Black labourers were granted living rights on farms in exchange for labour in terms of the so-called labour tenancy system, a practise which continued until the 1930's. As such, it has been documented that the Mapai family worked for the Malan family on Brandbach for 5 generations. In later years, some Black groups and labourers were forcibly relocated to the various homelands or "Bantustans". In the Brandbach area many black families have been moved from white farms to be resettled in the former homelands of Kwa-Ndebele, Lebowa and Bophuthatswana.

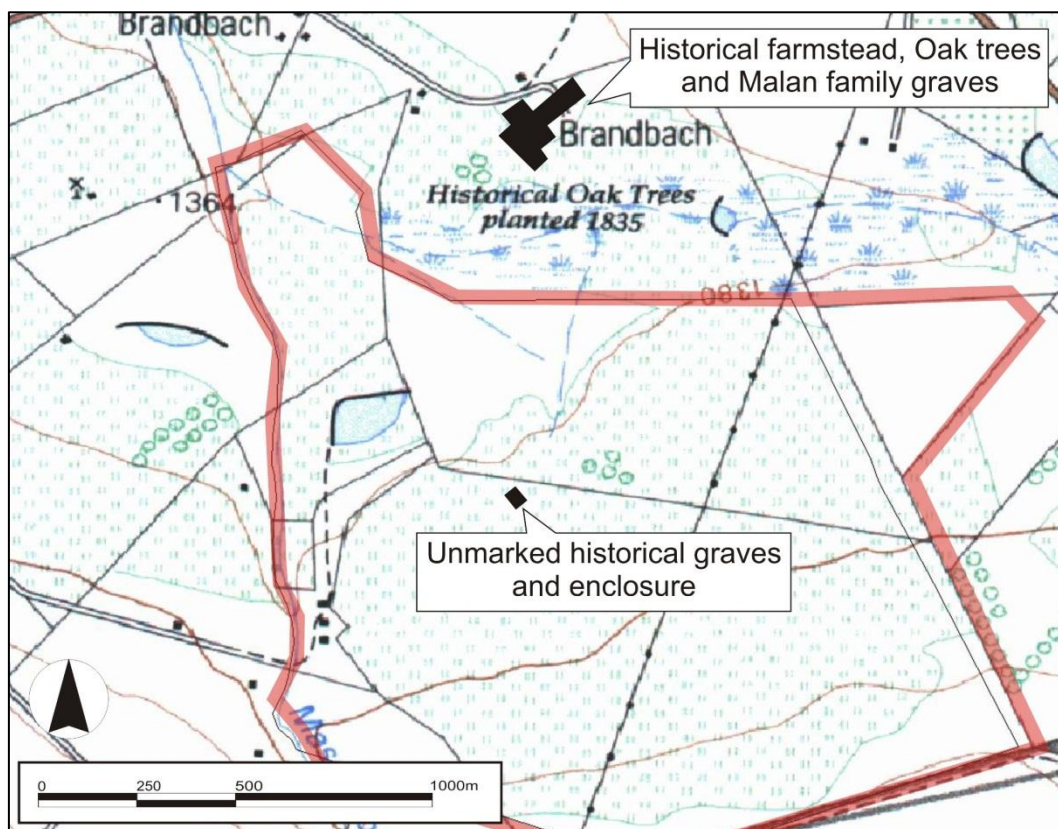


Figure 6-10: Detailed map of historical features on the farm Brandbach.

## 7 STATEMENTS OF SIGNIFICANCE

### 7.1 Heritage resources management and conservation

Archaeological sites, as previously defined in the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people have lived in the past – generally more than 60 years ago – and have left traces of their presence behind. In South Africa, archaeological sites include hominid fossil sites, places where people of the Earlier, Middle and Later Stone Age lived in open sites, river gravels, rock shelters and caves, Iron Age sites, graves, and a variety of historical sites and structures in rural areas, towns and cities. Palaeontological sites are those with fossil remains of plants and animals where people were not involved in the accumulation of the deposits. The basic principle of cultural heritage conservation is that archaeological and other heritage sites are valuable, scarce and *non-renewable*. Many such sites are unfortunately lost on a daily basis through development for housing, roads and infrastructure and once archaeological sites are damaged, they cannot be re-created as site integrity and authenticity are permanently lost. Archaeological sites have the potential to contribute to our understanding of the history of the region and of our country and continent. By preserving links with our past, we may not be able to revive lost cultural traditions, but it enables us to appreciate the role they have played in the history of our country.

### 7.2 Categories of significance

Rating the significance of archaeological sites, and consequently grading the potential impact on the resources is linked to the significance of the site itself. The significance of an archaeological site is based on the amount of

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deposit, the integrity of the context, the kind of deposit and the potential to help answer present research questions. Historical structures are defined by Section 34 of the National Heritage Resources Act, 1999, while other historical and cultural significant sites, places and features, are generally determined by community preferences. The guidelines as provided by the NHRA (Act No. 25 of 1999) in Section 3, with special reference to subsection 3 are used when determining the cultural significance or other special value of archaeological or historical sites. In addition, ICOMOS (the Australian Committee of the International Council on Monuments and Sites) highlights four cultural attributes, which are valuable to any given culture:

- *Aesthetic value:*

Aesthetic value includes aspects of sensory perception for which criteria can and should be stated. Such criteria include consideration of the form, scale, colour, texture and material of the fabric, the general atmosphere associated with the place and its uses and also the aesthetic values commonly assessed in the analysis of landscapes and townscape.

- *Historic value:*

Historic value encompasses the history of aesthetics, science and society and therefore to a large extent underlies all of the attributes discussed here. Usually a place has historical value because of some kind of influence by an event, person, phase or activity.

- *Scientific value:*

The scientific or research value of a place will depend upon the importance of the data involved, on its rarity, quality and on the degree to which the place may contribute further substantial information.

- *Social value:*

Social value includes the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a certain group.

With reference to the evaluation of sites, the certainty of prediction is definite, unless stated otherwise and if the significance of the site is rated high, the significance of the impact will also result in a high rating. The same rule applies if the significance rating of the site is low.

The significance of archaeological sites is generally ranked into the following categories.

Significance	Rating Action
No significance: sites that do not require mitigation.	None
Low significance: sites, which may require mitigation.	2a. Recording and documentation (Phase 1) of site; no further action required 2b. Controlled sampling (shovel test pits, augering), mapping and documentation (Phase 2 investigation); permit required for sampling and destruction
Medium significance: sites, which require mitigation.	3. Excavation of representative sample, C14 dating, mapping and documentation (Phase 2 investigation); permit required for sampling and destruction [including 2a & 2b]
High significance: sites, where disturbance should be avoided.	4a. Nomination for listing on Heritage Register (National, Provincial or Local) (Phase 2 & 3 investigation); site management plan; permit required if utilised for education or tourism
High significance: Graves and burial places	4b. Locate demonstrable descendants through social consulting; obtain permits from applicable legislation, ordinances and regional by-laws; exhumation and reinterment [including 2a, 2b & 3]

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A fundamental aspect in assessing the significance and protection status of a heritage resource is often whether or not the sustainable social and economic benefits of a proposed development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data / information, which would otherwise be lost. Such sites must be adequately recorded and sampled before being destroyed. These are generally sites graded as of low or medium significance.

### 7.3 Evaluation of Results: Delf Cullinan Mine site

The Brandbach conservancy and the larger Magaliesberg Highveld areas are recognised in terms of a rich and varied cultural legacy. Mindful of this, the following significance ratings are proposed:

- The Iron Age stone walled site (**Site IA01**) has been poorly preserved and no archaeological deposits were observed on the surface. The scientific potential and value of the site is probably limited and the site is rated as of medium to low significance.
- The intrinsic heritage and social value of the cemetery and graves at Brandbach (**Site BP01**) is noteworthy, especially within this rich historical landscape. The graves are of high significance.

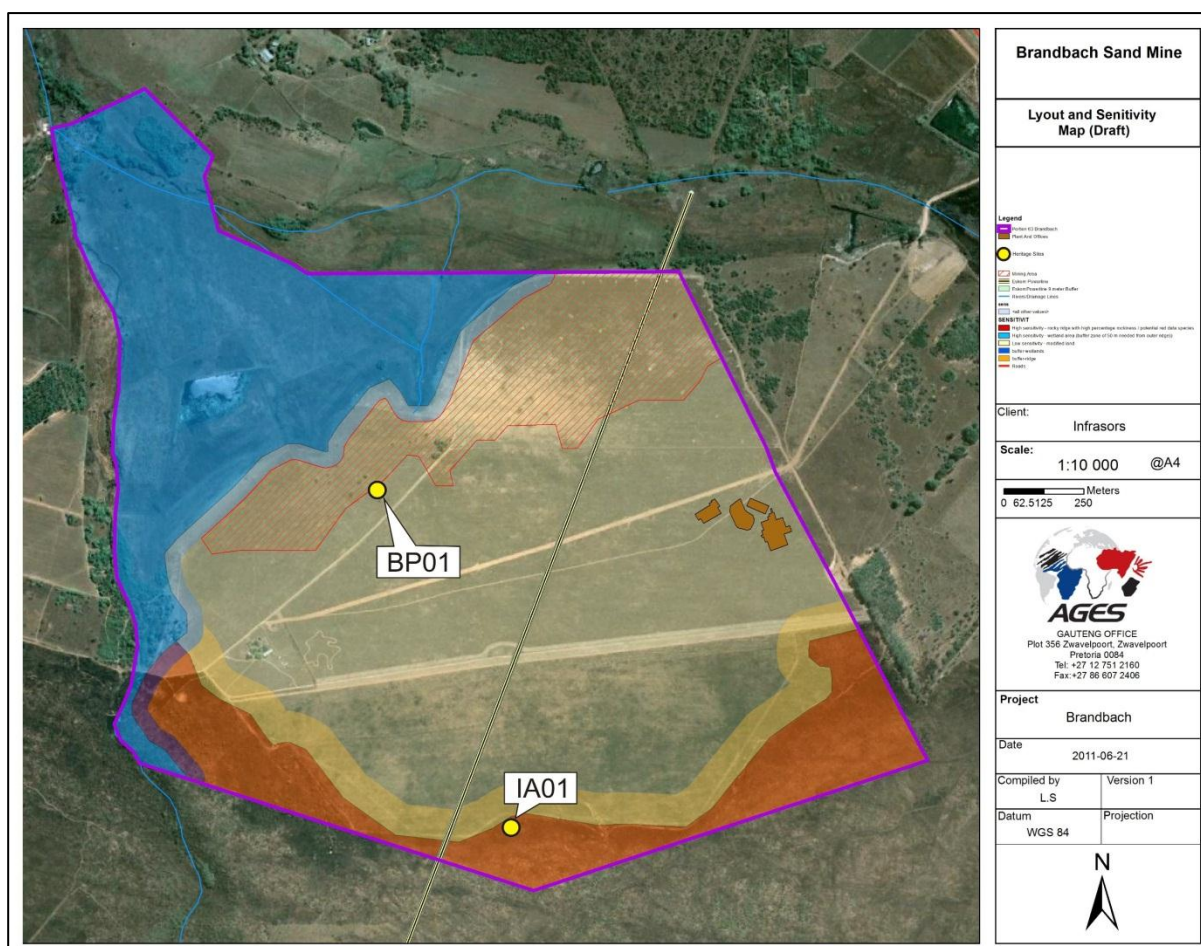


Figure 7-1: Heritage sensitivity map of the Delf Cullinan Sand Mine area.

7.3.1 Site IA01: Later Iron Age Stonewalled Site

1. SITE DESCRIPTION :							
1.1 General Site Description							
Later Iron Age stonewalled site							
1.2 Site features / artefacts / Other							
Site Location							
Province / Dsitrict	Gauteng Province			Map Number	2528DA		
Farm Name	Portion 63 of Brandbach 471JR			Co-ordinates	S25°40'04.56"	E28°38'18.99"	
Site Type							
Surface sites	X			Caves and rock shelters			
Larger open-air sites				Sealed sites (deposits)			
River deposits				Other			
Site Function							
Living / habitation	X			Kill			
Ceremonial				Burial			
Trading / Barter				Art			
Quarry / Mining / Smelting				Other			
Site Placement							
Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope	X	Plains	X
Other / Comments							
Vegetation							
Riverine forest		Bushveld		Savannah		Mountain forest	
Thornveld	X	Grassland	X	Cultivated	X	Other	
Age Classification							
Stone Age		Early Iron Age		Middle Iron Age		Later Iron Age	X
Historical		Other					
Material Culture							
Midden		House Remains		Stone Walling	X	Stone Structures	X
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	X
Metal		Ceramics (Potter)		Ceramics (Porcelain)		Stone (non-lithic)	
Metal slag		Tuyere		Fauna		Bead (Glass)	
Bead (OES / Shell)		Glass		Lithics		Smelting Residues	
Other:				Other:			
1.3 Site Condition							
Site preservation is generally poor as stone structures and features have collapsed. No material culture was located in association with the site.							
2. SITE EVALUATION							
2.1 HERITAGE VALUE (NHRA, Section 2 [3])				High	Medium	Low	
It has importance to the community or pattern of South Africa's history or pre-colonial history.					X		
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.						X	
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.						X	
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.						X	
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or						X	

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cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X	
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons.		X	
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.			X
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.			X
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.		X	
<b>FIELD REGISTER RATING</b>			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			X
Generally Protected C [Low significance, no further action]			
<b>C. SPHERE OF SIGNIFICANCE</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>
International			
National			
Provincial			
Local		X	
Specific community			
<b>E. GENERAL STATEMENT OF SITE SIGNIFICANCE</b>			
Low			
Medium			X
High			
<b>F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT</b>			
None			
Peripheral			
Destruction			X
Uncertain			
<b>G. RECOMMENDED MITIGATION</b>			
If further impact is envisaged:			
- Survey and mapping			
- Permit from SAHRA for destruction			
<b>H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS</b>			
- National Heritage Resources Act (Act no. 25 of 1999)			

7.3.2 Site BP01: Single graves and stone enclosure

1. SITE DESCRIPTION :							
1.1 General Site Description							
Informal cemetery containing 6 unmarked graves, possibly that of the Mapapai family, and stone enclosure.							
1.2 Site features / artefacts / Other							
Site Location							
Province / Dsitrict	Gauteng Province			Map Number	2528DA		
Farm Name	Portion 63 of Brandbach 471JR			Co-ordinates	S25°39'30.95"	E28°38'05.89"	
Site Type							
Surface sites	X			Caves and rock shelters			
Larger open-air sites				Sealed sites (deposits)			
River deposits				Other			
Site Function							
Living / habitation				Kill			
Ceremonial				Burial	X		
Trading / Barter				Art			
Quarry / Mining / Smelting				Other			
Site Placement							
Valley floor		Hill top		Vlei/swamp		River Mouth	
Dam		River Bank		Slope		Plains	X
Other / Comments							
Vegetation							
Riverine forest		Bushveld		Savannah		Mountain forest	
Thornveld	X	Grassland	X	Cultivated	X	Other	
Age Classification							
Stone Age		Early Iron Age		Middle Iron Age		Later Iron Age	
Historical	X	Other	X - recent				
Material Culture							
Midden		House Remains		Stone Walling		Stone Structures	
Granary		Grinding Stone (L)		Grinding Stone (U)		Granary Stand	
Metal		Ceramics (Potter)		Ceramics (Porcelain)		Stone (non-lithic)	
Metal slag		Tuyere		Fauna		Bead (Glass)	
Bead (OES / Shell)		Glass		Lithics		Smelting Residues	
Other: X – grave dressing				Other: X – funeral goods			
1.3 Site Condition							
Site preservation is good as the burials are of recent age.							
2. SITE EVALUATION							
2.1 HERITAGE VALUE (NHRA, Section 2 [3])				High	Medium	Low	
It has importance to the community or pattern of South Africa's history or pre-colonial history.				X			
It possesses unique, uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.					X		
It has potential to yield information that will contribute to an understanding of South Africa's natural and cultural heritage.					X		
It is of importance in demonstrating the principle characteristics of a particular class of South Africa's natural or cultural places or objects.					X		
It has importance in exhibiting particular aesthetic characteristics valued by a particular community or				X			

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cultural group.			
It has importance in demonstrating a high degree of creative or technical achievement at a particular period.		X	
It has marked or special association with a particular community or cultural group for social, cultural or spiritual reasons.	X		
It has strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.		X	
It has significance through contributing towards the promotion of a local sociocultural identity and can be developed as a tourist destination.			X
It has significance relating to the history of slavery in South Africa.		X	
It has importance to the wider understanding of temporal changes within cultural landscapes, settlement patterns and human occupation.			X
<b>FIELD REGISTER RATING</b>			
National/Grade 1 [should be registered, retained]			
Provincial/Grade 2 [should be registered, retained]			
Local/Grade 3A [should be registered, mitigation not advised]			X
Local/Grade 3B [High significance; mitigation, partly retained]			
Generally Protected A [High/Medium significance, mitigation]			
Generally protected B [Medium significance, to be recorded]			
Generally Protected C [Low significance, no further action]			
<b>C. SPHERE OF SIGNIFICANCE</b>			
	<b>High</b>	<b>Medium</b>	<b>Low</b>
International			
National			
Provincial			
Local	X		
Specific community			
<b>E. GENERAL STATEMENT OF SITE SIGNIFICANCE</b>			
Low			
Medium			
High			X
<b>F. RATING OF POTENTIAL IMPACT OF DEVELOPMENT</b>			
None			
Peripheral			
Destruction			X
Uncertain			
<b>G. RECOMMENDED MITIGATION</b>			
<b>If further impact is envisaged:</b>			
<ul style="list-style-type: none"> <li>- Social consultation</li> <li>- Exhumation and reburial</li> </ul>			
<b>H. APPLICABLE LEGISLATION AND LEGAL REQUIREMENTS</b>			
<ul style="list-style-type: none"> <li>- Human Tissue Act (Act 65 of 1983 as amended).</li> <li>- Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925)</li> <li>- Ordinance on Excavations (Ordinance no. 12 of 1980)</li> <li>- Local and regional provisions, laws and by-laws</li> <li>- National Heritage Resources Act (Act no. 25 of 1999)</li> <li>- Permit from SAHRA for removal</li> </ul>			



## 8 RECOMMENDATIONS

A considerable and valuable selection of pre-colonial and colonial archaeological and heritage sites exist on the Highveld and areas surrounding Bronkhorstspuit and one would anticipate further archaeological and historical sites to occur in Brandbach's immediate surroundings. Therefore, the author of this report proposes the following recommendations, based on findings contained in this Phase 1 AIA Report:

- Due cognisance should be taken of the larger archaeological landscape of the area in order to avoid the destruction of previously undetected heritage sites in the area.
- The scientific value of the later Iron Age site (**Site IA01**) occurring in the study area has been greatly compromised by its poor preservation. In addition, the absence of surface finds and deposits implies a brief occupation of the site. However, as the age of the site is not known, it is recommended that the features be thoroughly documented and attempts be made to establish a temporal and historical context for the structures by means of a desktop study, if the site was to be impacted by the mining development. In addition, a destruction permit should be obtained from the relevant resources authority, should the site be directly impacted by development activities of the mine. Finally, a careful watching brief monitoring process should be followed for possible development activities around the site, as periphery features such as cattle outposts, meeting areas and / or graves are likely to occur in the larger landscape.
- In principle, graves or any possible burials should be excluded from mitigation measures as the legal, moral and ethical aspects of the disturbance of graves are extremely complex. Also, graves older than 60 years, or unmarked burial places are protected under the NHRA (Act 25 of 1999). The intrinsic heritage and social value of the informal cemetery at Brandbach (**Site BP01**) requires special management attention and its close proximity to areas identified for sand mining necessitates a conservation buffer zone of at least 50m around the graves. In addition, it is recommended that the cemetery be properly fenced and access control be implemented. However, should the cemetery or the proposed 50m buffer zone be impacted in any way by the planned mine, a full grave relocation is recommended for the entire cemetery. This measure should be undertaken by a qualified archaeologist, and in accordance with the Human Tissue Act (Act 65 of 1983 as amended), the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the National Heritage Resources Act (Act no. 25 of 1999) and any local and regional provisions, laws and by-laws pertaining to the cemetery. A full social consultation process should occur in conjunction with the mitigation of the cemetery.
- A careful watching brief monitoring process is recommended for any developments at the site. Should any subsurface paleontological / archaeological material be exposed during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately
- It should be noted that mitigation measures are valid for the duration of the development process, and mitigation measures might have to be implemented on additional features of heritage importance not detected during this Phase 1 assessment (e.g. uncovered during the construction process).

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## 9 GENERAL COMMENTS AND CONDITIONS

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This Phase 1 AIA report serves to confirm the extent and importance of archaeological material at the proposed Delf Cullinan Sand Mine on the farm Brandbach 471JR. The landscape encompasses a rich and diverse archaeological landscape and cognisance should be taken of archaeological material that might be present in surface and sub-surface deposits.

Such material might include:

- Formal Earlier Stone Age stone tools such as handaxes, choppers and cleavers.
- Formal Middle Stone Age stone tools such as points, blades and scrapers.
- Formal Later Stone Age stone tools such a microlithic blades, points and scrapers.
- Lithic residues and debris such as stone cores and flakes.
- Iron Age remains such as decorated and undecorated potsherds.
- Iron Age remains such as iron objects.
- Beads made from ostrich eggshell and glass.
- Ash middens and cattle dung deposits and accumulations.
- Animal bones and faunal remains.
- Human remains/graves.
- Iron Age stone walling or any sub-surface structures.
- Historical brick structures.
- Glass fragments.
- Porcelain / earthenware / stoneware.
- Tin.
- Metal objects.

If such site were to be encountered or impacted by any proposed developments, recommendations contained in this report, as well as endorsement of mitigation measures as set out by SAHRA, the National Resources Act and the CRM section of ASAPA will be required. Please note that this report is a Phase 1 archaeological heritage impact assessment/investigation only and does not include or exempt other required heritage impact assessments.

It must be emphasised that the conclusions and recommendations expressed in this archaeological heritage sensitivity investigation are based on the visibility of archaeological sites/features and may not therefore, represent the area's complete archaeological legacy. Many sites/features may be covered by soil and vegetation and might only be located during sub-surface investigations. If subsurface archaeological deposits, artefacts or skeletal material were to be recovered in the area during construction activities, all activities should be suspended and the archaeological specialist should be notified immediately (**cf. NHRA (Act No. 25 of 1999), Section 36 (6)**).

It must also be clear that Archaeological Specialist Reports (AIAs) will be assessed by the relevant heritage resources authority. The final decision rests with the heritage resources authority, which should give a permit or a formal letter of permission for the destruction of any cultural sites.

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