

Heritage Impact Assessment Report

HERITAGE IMPACT ASSESSMENT FOR THE
PROPOSED VOGELSTRUISFONTEIN SAND MINE

PREPARED BY:
G&A HERITAGE



PREPARED FOR:
LENCEO

CREDIT SHEET

Project Director

STEPHAN GAIGHER (BA Hons, Archaeology, UP)

Principal Investigator for G&A Heritage

Member of ASAPA (Site Director Status)

Tel.: (015) 516 1561

Cell.: 073 752 6583

E-mail: stephan@gaheritage.co.za

Website: <http://www.gaheritage.co.za>

Report Author

STEPHAN GAIGHER

Disclaimer; *Although all possible care is taken to identify all sites of cultural importance during the investigation of study areas, it is always possible that hidden or sub-surface sites could be overlooked during the study. G&A Heritage and its personnel will not be held liable for such oversights or for costs incurred as a result of such oversights.*

SIGNED OFF BY: STEPHAN GAIGHER



MANAGEMENT SUMMARY

Site name and location: Vogelstruisfontein Sand Mine, Remainder of Portion 1 of the farm Vogelstruisfontein 2631Q near Randfontein, Gauteng.

Municipal Area: West Rand District Municipality.

Developer: Lengeo

Consultant: G&A Heritage, PO Box 522, Louis Trichardt, 0920, South Africa. 38A Vorster Street, Louis Trichardt, 0920

Date of Report: 29 October 2014

Lengeo is proposing the development of a 414 ha Sand Mine on the Remainder of Portion 1 of the Farm Vogelstruisfontein 2631Q near Randfontein in the West Rand District Municipality.

Findings;

The area is currently used for combined agriculture and mining. It is not anticipated that the development will be bedrock intrusive and as such a paleontological deposits will not be affected. A paleontological analysis of the area indicated that it lies on non-fossiliferous strata.

Recommendations;

Since no sites of heritage importance could be identified on site, no further recommendations are necessary. There is a possibility of unmarked graves being uncovered during mining and the relevant steps for the mitigation of such a situation is given in the report.

Fatal Flaws;

No fatal flaws were identified.

TABLE OF CONTENTS

Introduction	7
Project Location	10
Methodology	14
Evaluating Heritage Impacts	14
Assessing Visual Impact.....	15
Previous Studies in the Area	15
Regional Cultural Context	16
Palaeontology	16
Stone Age.....	16
Iron Age	16
The Historic Era	17
Cultural Landscape	18
Built Environment.....	18
Assessment of Heritage Potential	20
Assessment Matrix.....	20
Determining Heritage Sensitivity	20
Significance Evaluation	22
Historic Significance.....	22
Architectural Significance	22
Spatial Significance.....	23
Findings.....	23
Built Environment Structures	23
Paleontological Findings.....	27
Archaeological finds.....	28
Impact Evaluation	28
Determination of Significance of Impacts	28

2014/10/29

Impact Rating System.....29

Rating System Used To Classify Impacts29

Anticipated Impact of the Development.....32

Resource Management Recommendations.....33

Conclusion34

References Cited & Researched35

TABLE OF FIGURES

Figure 1. Location of Proposed Vogelstruisfontein Sand Mine (2006 Cadastral Map Series 2627BA)	10
Figure 2. Aerial view of the study area.....	11
Figure 3. Start point of study area on N14.....	11
Figure 4. Study area	12
Figure 5. Study area	12
Figure 6. Excavations in study area.....	13
Figure 7. Current mining in study area.....	13
Figure 8. Current mining in study area.....	14
Figure 9. Kocksoord Museum	14
Figure 10. Mining equipment and recent built structures.....	18
Figure 11. Formalised buildings on neighbouring property (poultry houses).	23
Figure 12. Pump house and crusher conveyor located within the study area	24
Figure 13. 2006 Mapset (2627 BA)	24
Figure 14. 2002 Mapset (2627 BA).....	25
Figure 15. 1995 Mapset (2627 BA).....	25
Figure 16. 1976 Mapset (2627 BA).....	26
Figure 17. 1957 Mapset (2627 BA).....	26
Figure 18. 1944 Mapset (2627 BA).....	27
Figure 19. Geological map of Gauteng with site indicated in red	28



PROJECT RESOURCES

HERITAGE IMPACT REPORT

BASIC HERITAGE IMPACT ASSESSMENT REPORT FOR THE VOGELSTRUISFONTEIN SAND MINE.

INTRODUCTION

Legislation and methodology

G&A Heritage was appointed by Lengeo to undertake a first phase heritage impact assessment for the proposed Vogelstruisfontein Sand Mine located on the Remainder of Portion 1 of the farm Vogelstruisfontein 263IQ near Randfontein. Section 38(1) of the South African Heritage Resources Act (25 of 1999) requires that a heritage study be undertaken for:

- (a) construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (b) construction of a bridge or similar structure exceeding 50 m in length; and
- (c) any development, or other activity which will change the character of an area of land, or water –
 - (1) exceeding 10 000 m² in extent;
 - (2) involving three or more existing erven or subdivisions thereof; or
 - (3) involving three or more erven, or subdivisions thereof, which have been consolidated within the past five years; or
- (d) the costs of which will exceed a sum set in terms of regulations; or
- (e) any other category of development provided for in regulations.

While the above describes the parameters of developments that fall under this Act., Section 38 (8) of the NHRA is applicable to this development. This section states that;

(8) The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

In regards to a development such as this that falls under Section 38 (8) of the NHRA, the requirements of Section 38 (3) applies to the subsequent reporting, stating that;

- (3) 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.

A heritage impact assessment is not limited to archaeological artefacts, historical buildings and graves. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. A heritage resource is defined as any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance. This includes the following:

- (a) places, buildings, structures and equipment;
- (b) places to which oral traditions are attached or which are associated with living heritage;
- (c) historical settlements and townscapes;
- (d) landscapes and natural features;
- (e) geological sites of scientific or cultural importance;
- (f) archaeological and paleontological sites;
- (g) graves and burial grounds, including –
 - (1) ancestral graves,
 - (2) royal graves and graves of traditional leaders,
 - (3) graves of victims of conflict (iv) graves of important individuals,
 - (4) historical graves and cemeteries older than 60 years, and
 - (5) other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended);
- (h) movable objects, including ;
 - (1) objects recovered from the soil or waters of South Africa including archaeological and paleontological objects and material, meteorites and rare geological specimens;
 - (2) ethnographic art and objects;
 - (3) military objects;
 - (4) objects of decorative art;
 - (5) objects of fine art;
 - (6) objects of scientific or technological interest;
 - (7) books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings; and
 - (8) any other prescribed categories, but excluding any object made by a living person;
- (i) battlefields;
- (j) traditional building techniques.

A 'place' is defined as:

- (a) A site, area or region;
- (b) A building or other structure (which may include equipment, furniture, fittings and articles associated with or connected with such building or other structure);
- (c) a group of buildings or other structures (which may include equipment, furniture, fittings and articles associated with or connected with such group of buildings or other structures); and
- (d) an open space, including a public square, street or park; and in relation to the management of a place, includes the immediate surroundings of a place.

'Structures' means any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

'Archaeological' means:

- (a) material remains resulting from human activity which are in a state of disuse and are in or on land and are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- (b) rock art, being a form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and is older than 100 years including any area within 10 m of such representation; and
- (c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land or in the maritime cultural zone referred to in section 5 of the Maritime Zones Act 1994 (Act 15 of 1994), and any cargo, debris or artefacts found or associated therewith, which are older than 60 years or which in terms of national legislation are considered to be worthy of conservation;
- (d) features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

'Paleontological' means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trace.

'Grave' means a place of interment and includes the contents, headstone or other marker of and any other structures on or associated with such place. The South African Heritage Resources Agency (SAHRA) will only issue a permit for the alteration of a grave if it is satisfied that every reasonable effort has been made to contact and obtain permission from the families concerned.

The removal of graves is subject to the following procedures as outlined by the SAHRA:

- Notification of the impending removals (using English, Afrikaans and local language media and notices at the grave site);
- Consultation with individuals or communities related or known to the deceased;
- Satisfactory arrangements for the curation of human remains and / or headstones in a museum, where applicable;
- Procurement of a permit from the SAHRA;
- Appropriate arrangements for the exhumation (preferably by a suitably trained archaeologist) and re-interment (sometimes by a registered undertaker, in a formally proclaimed cemetery);
- Observation of rituals or ceremonies required by the families.

The limitations and assumptions associated with this study are as follows;

- Sites were evaluated by means of description of the cultural landscape and analysis of written sources and available databases.
- It was assumed that layout as provided by Galago Environmental was correct.
- We assumed that the public participation process performed as part of the Environmental Impact Assessment process would be sufficiently encompassing not to be repeated in the Heritage Impact Assessment.

Table 1. Impacts on the NHRA Sections

Act	Section	Description	Possible Impact	Action
National Heritage Resources Act (NHRA)	34	Preservation of buildings older than 60 years	No impact	None
	35	Archaeological, paleontological and meteor sites	No impact	None
	36	Graves and burial sites	Possible Impact	Management plan
	37	Protection of public monuments	No impact	None
	38	Does activity trigger a HIA?	Yes	HIA

Table 2. NHRA Triggers

Action Trigger	Yes/No	Description
Construction of a road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length.	No	N/A
Construction of a bridge or similar structure exceeding 50m in length.	No	N/A
Development exceeding 5000 m ²	Yes	Vogelstruisfontein Sand Mine
Development involving more than 3 erven or sub divisions	No	N/A
Development involving more than 3 erven or sub divisions that have been consolidated in the past 5 years	No	N/A
Re-zoning of site exceeding 10 000 m ²	Yes	Possible rezoning
Any other development category, public open space, squares, parks or recreational grounds	No	N/A

PROJECT LOCATION

The proposed Vogelstruisfontein Sand Mine is located in a field currently used for combined agriculture and mining just off the N14 approximately 14 km West-North-West of Randfontein in the West Rand District Municipality.

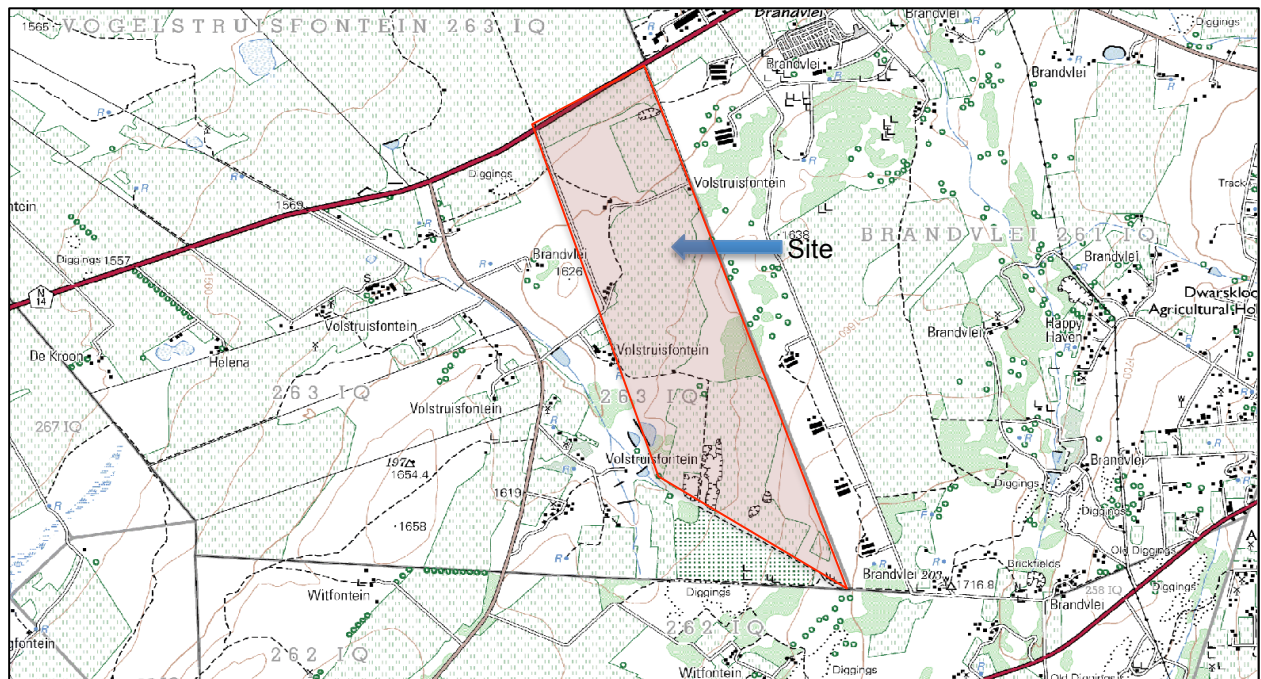


Figure 1. Location of Proposed Vogelstruisfontein Sand Mine (2006 Cadastral Map Series 2627BA)



Figure 2. Aerial view of the study area



Figure 3. Start point of study area on N14



Figure 4. Study area



Figure 5. Study area



Figure 6. Excavations in study area



Figure 7. Current mining in study area



Figure 8. Current mining in study area



Figure 9. Kocksoord Museum: located within 10km from the proposed Vogelstruisfontein Sand Mine

METHODOLOGY

This study defines the heritage component of the Environmental Impact Assessment process. It is described as a first phase Heritage Impact Assessment (HIA). This report attempts to evaluate both the accumulated heritage knowledge of the area as well as information derived from direct physical observations.

EVALUATING HERITAGE IMPACTS

A combination of document research as well as the determination of the geographic suitability of areas and the evaluation of aerial photographs determined which areas could and should be accessed.

After plotting of the site on GPS the areas were accessed using suitable combinations of vehicle access and access by foot.

Sites were documented by digital photography and geo-located with GPS readings using the WGS 84 datum.

Further techniques included interviews with local inhabitants, visiting local museums and information centres and discussions with local experts. All this information was combined with information from an extensive literature study as well as the result of archival studies based on SAHRA provincial databases.

ASSESSING VISUAL IMPACT

Visual impacts of developments result when sites that are culturally celebrated are visually affected by a development. The exact parameters for the determination of visual impacts have not yet been rigidly defined and are still mostly open to interpretation. CNdV and DEAP (2006) have developed some guidelines for the management of the visual impacts of wind turbines in the Western Cape, although these have not yet been formalized. In these guidelines they recommend a buffer zone of 1km around significant heritage sites to minimize the visual impact.

PREVIOUS STUDIES IN THE AREA

- Van Schalkwyk, J. 2008. Heritage Survey Report for the Development of Water Pipelines for the Droofoheuveld and Middelvlei Townships, Randfontein, Gauteng Province.
- Huffmann, T. 2007. Luipaardsvlei Archaeological Assessment, Randfontein.
- Van Schalkwyk, J. 2009. Heritage Impact Assessment for the proposed Ridgeview Township Development, Randfontein Local Municipality, Gauteng Province.
- Van der Walt, J. 2011. Archaeological Impact Assessment: Proposed Marula 132 / 11KV Substation on a Portion of the Farm Wheatlands 260 IQ, Randfontein, Gauteng Province.

HERITAGE INDICATORS WITHIN THE RECEIVING ENVIRONMENTS

REGIONAL CULTURAL CONTEXT

PALAEONTOLOGY

The palaeontology of Western Gauteng is well researched in areas. The discovery of the Sterkfontein skeletons put this area in the forefront of palaeontology worldwide. The rule of “absence of evidence is not evidence of absence” should be applied to this area. Taken the rich palaeontology of Western Gauteng it is conceivable that similar finds could be made in this area. A further investigation into the fossiliferous nature of this area will be given at a later stage.

STONE AGE

No substantial number of Stone Age sites from any period of the Stone Age is known to exist in this area – primarily as a result of a lack of research and general ignorance amongst the layman in recognizing stone tools that often may occur. However, it is possible that the first humans in the Brakpan area may have been preceded by *Homo erectus*, who roamed large parts of the world during the Acheulian period of the Early Stone Age, 500 000 years ago. The predecessors of *Homo erectus*, *Australopithecus*, which is considered to be the earliest ancestor of modern humans, lived in the Blaauwbank Valley around Krugersdorp (today part of the Cradle of Humankind – a World Heritage Site) several million years ago.

During the Middle Stone Age, 200 000 years ago, modern man or *Homo sapiens* emerged, manufacturing a wider range of tools, with technologies more advanced than those from earlier periods. This enabled skilled hunter-gatherer bands to adapt to different environments. From this time onwards, rock shelters and caves were used for occupation and reoccupation over very long periods of time (Mitchell 2002). Two Middle Stone Age sites at the Withoek Spruit (Brakpan) were researched 17 years ago, but no information on this discovery has been published.

The Late Stone Age, considered to have started some 20 000 years ago, is associated with the predecessors of the San and Khoi Khoi. San hunter-gatherer bands with their small (microlithic) stone tools may have lived in Eastern Gauteng, as a magnificent engraving site near Duncanville attests to their presence in Vereeniging, south of, but close to Ekurhuleni. Stone Age hunter-gatherers lived well into the 19th century in some places in SA, but may not have been present in Brakpan when the first European colonists crossed the Vaal River during the early part of the 19th century. Stone Age sites may occur all over the area where an unknown number may have been obliterated by mining activities, urbanization, industrialization, agriculture and other development activities during the past decades (Morris 2004).

IRON AGE

A considerable number of Late Iron Age, stone walled sites, dating from the 18th and the 19th centuries (some of which may have been occupied as early as the 16th century), occur along and on top of the rocky ridges of the eastern part of the Klipriviersberg towards Alberton. These settlements and features in these sites, such as huts, were built with dry stone, reed and clay available from the mountain and the Klip River (Mason 1968, 1986).

The Late Iron Age sites within Ekurhuleni’s south-eastern border are a ‘spill-over’ from a larger concentration which are located further towards the west, in the Witwatersrand, while large concentrations of stone walled sites are also located directly to the south of Johannesburg, in the mountainous area around the Suikerbosrand in Heidelberg. The stone walled settlements are concentrated in clusters of sites and sometimes are dispersed over large areas making them vulnerable to developments of various kinds. A site consists of a circular or elliptical outer wall that is composed of a number of scalloped walls facing inwards towards one or more enclosures. Whilst the outer scalloped

walls served as dwelling quarters for various family groups, cattle, sheep and goat were stocked in the centrally located enclosures. Huts with clay walls and floors were built inside the dwelling units. Pottery and metal items are common on the sites. However, iron and copper were not produced locally on these sites (Killick 2004).

THE HISTORIC ERA

Date	Description
	The Cradle of humankind is located approximately 25 km from Randfontein.
1550 - 1580	The AmaNdebele tribe lived at Emhlangeni (Randfontein area) under King Mhlanga.
1830's - 1840's	The Boers, who were unhappy with the British rule in the Cape Colony trekked north to found their own independent states, namely the Orange Free State and the South African Republic, known to the British as the Transvaal.
1857	Botha and Jonker families arrived in the area. They owned the farm <i>Groot Elandsvlei</i> where the suburbs of Randgate, Loumarina and Wilbotsdal are today.
1877 - 1881	The British attempt to annex the Transvaal. They are met with resistance and after a brief war (The First Boer War) suffer defeat.
1883	Paul Kruger is elected the President of the South African Republic (Transvaal).
1880 - 1890's	Prospectors settled in the area when gold and coal were discovered and sparked the gold rush that gave rise to Johannesburg.
1889	JB Robinson bought the farm Randfontein and established the Randfontein Estate Golf Mining Company.
1890	Randfontein town was established, but was administered by Krugersdorp until it became a municipality in 1929.
1889 - 1898	On 26 November 1889, Pres. Paul Kruger proclaimed that a part of the farm Middelvlei was declared a gold mining area. The mine was rezoned as a residential area in 1892. On 24 August 1896 the town Kocksoord was formed (named after General J.H. M. Kock – a member of the Executive Council of the ZAR and representative of the Electoral Division Potchefstroom, which was the ward that Kocksoord fell under.
1898	On 5 March 1898 General Kock laid the corner stone of the first Government Building in Kocksoord namely the " <i>Mijncommissaris-Pos en Telegraaf Kantoor</i> " (the words can still be seen on the building's front gable). The building was designed by Zietze Wopkes Wierda. The building consisted of a main hall, post office and a flat where the Mine Commissioner, Hendrik Kock, lived until the outbreak of the Anglo-Boer War in 1899. (A small jail was also erected in the vicinity. Even though it was built from clay, some of the walls still exist). The British troops then used it as a look out post. A trap door in the ceiling and one in the roof gave access to a platform above the ridge of the roof. The English soldiers stood guard there at all times.
1902 onwards	After peace was declared the building fell into disuse (except for a brief period in 1903 when it was used as a Post Office) until 2 May 1905 when the English Medium Primary School Kocksoord was established there. It was used for this purpose until 1950, when part of the building was transformed into a Post Office. It was used as such up to 1971, when a new Post Office was opened and the old building was yet again abandoned. The building was left to ruin and was vandalized. In 1975, the Town Council bought the property with a view of restoring it.
1904	Canals were dug around Randfontein to lead storm water and water from surrounding natural springs to a central dam known as Homestead Lake. (The lake is today named Riebeeck Lake)
1910 - 1912	Messrs. Garvie, Lazar and Botha laid out the Randgate Township. It was at the stage the most westerly development on the Witwatersrand and because of unsuccessful attempts by gold mining companies, it was accepted that there were no gold further west. (The DR congregation of

	Randgate was officially known as "Randpoort" in Afrikaans.
1940	Kocksoord is incorporated with the Randfontein municipality.
1935 – 1940's	Dr. Robert Broom found hominid fossils at Sterkfontein. Gert Terrblanche took Dr. Broom to see fragments of a skull at Kromdraai which was later identified as <i>Paranthropus robustus</i> .
	The oldest controlled use of fire was also discovered at Swartkrans and dated over 1 million years ago.
1947	Dr. Robert Broom and John T. Robinson discovered the 2.3-million year-old fossil <i>Australopithecus africanus</i> (nicknamed "Mrs. Ples") at the Sterkfontein Caves, Cradle of Humankind.
1966 – present	Phillip Tobias began excavations at Sterkfontein, which are still continuing and the longest continuously running fossil excavations in the world. Many other hominoid fossils were discovered in the area since.
1999	Cradle of Humankind is declared a World Heritage Site by UNESCO.

Sources:

www.sahistory.org.za

<http://www.westrandtourism.co.za>

<http://www.randfonteininfo.co.za>

www.heritageportal.co.za

Hamilton Hamann, Randfontein: A Town Like No Other

Interview with Brian Manyisa (Museum Curator and Local Librarian at Kocksoord) and pamphlets received via email from the Kocksoord Museum.

CULTURAL LANDSCAPE

The main cultural landscape type associated with this area is one of combined agriculture and mining. Extensive ground works have been performed on site and erosion has taken place. The mine dumps visible from the site adds to the atmosphere of mining and exploration. Fields had been ploughed and farming has taken place. This cultural identity has grown to such an extent that it overshadows any previous cultural identity that the area might have had in the past.

BUILT ENVIRONMENT

There are two clusters of structures on both sides of the development. These are both of recent nature and carry no heritage value.

Some earlier mining equipment is scattered over the study area. These also hold no historic significance.



Figure 10. Mining equipment and recent built structures

MEASURING AND EVALUATING THE CULTURAL SENSITIVITY OF THE STUDY AREA

In 2003 the South African Heritage Resource Agency (SAHRA) compiled the following guidelines to evaluate the cultural significance of individual heritage resources;

TYPE OF RESOURCE;

- Place
- Archaeological Site
- Structure
- Grave
- Paleontological Feature
- Geological Feature

TYPE OF SIGNIFICANCE

1. HISTORIC VALUE

It is important in the community, or pattern of history

- o Important in the evolution of cultural landscapes and settlement patterns
- o Important in exhibiting density, richness or diversity of cultural features illustrating the human occupation and evolution of the nation, province, region or locality.
- o Important for association with events, developments or cultural phases that have had a significant role in the human occupation and evolution of the nation, province, region or community.
- o Important as an example for technical, creative, design or artistic excellence, innovation or achievement in a particular period.

It has strong or special association with the life or work of a person, group or organisation of importance in history;

- o Importance for close associations with individuals, groups or organisations whose life, works or activities have been significant within the history of the nation, province, region or community.

It has significance relating to the history of slavery

- o Importance for a direct link to the history of slavery in South Africa.

2. AESTHETIC VALUE

It is important in exhibiting particular aesthetic characteristics valued by a community or cultural group.

- o Important to a community for aesthetic characteristics held in high esteem or otherwise valued by the community.
- o Importance for its creative, design or artistic excellence, innovation or achievement.
- o Importance for its contribution to the aesthetic values of the setting demonstrated by a landmark quality or having impact on important vistas or otherwise contributing to the identified aesthetic qualities of the cultural environs or the natural landscape within which it is located.
- o In the case of an historic precinct, importance for the aesthetic character created by the individual components which collectively form a significant streetscape, townscape or cultural environment.

3. SCIENTIFIC VALUE

It has potential to yield information that will contribute to an understanding of natural or cultural

heritage

- Importance for information contributing to a wider understanding of natural or cultural history by virtue of its use as a research site, teaching site, type locality, reference or benchmark site.
- Importance for information contributing to a wider understanding of the origin of the universe or of the development of the earth.
- Importance for information contributing to a wider understanding of the origin of life; the development of plant or animal species, or the biological or cultural development of hominid or human species.
- Importance for its potential to yield information contributing to a wider understanding of the history of human occupation of the nation, Province, region or locality.
- It is important in demonstrating a high degree of creative or technical achievement at a particular period
- Importance for its technical innovation or achievement.

4. SOCIAL VALUE

- It has strong or special association with a particular community or cultural group for social, cultural or spiritual reasons
- Importance as a place highly valued by a community or cultural group for reasons of social, cultural, religious, spiritual, symbolic, aesthetic or educational associations.
- Importance in contributing to a community's sense of place.

DEGREES OF SIGNIFICANCE

In 2006 SAHRA prescribed classification standards for determining the heritage significance of sites within the SADC region. These recommendations were subsequently approved by ASAPA and are reproduced here to indicate the measuring standards for heritage sensitivity used in this report;

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; National Heritage Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Heritage Sites nomination
Local Significance (LS)	Grade 3A	High	Conservation; mitigation not advised
Local Significance (LS)	Grade 3B	High	Mitigation with part of site retained in original
Generally Protected A (GP.A)	-	High/Medium	Mitigation before destruction
Generally Protected B (GP.B)	-	Medium	Recording before destruction
Generally Protected C (GP.C)	-	Low	Destruction

Table 3. SAHRA Assigned Heritage Site Significance Grading

Assessment of Heritage Potential

Assessment Matrix

Determining Heritage Sensitivity

In addition to guidelines provided by the National Heritage Resources Act (Act No. 25 of 1999), a set of criteria based on Deacon (J) and Whitelaw (1997) for assessing archaeological significance has been developed for Northern Cape settings (Morris 2007a). These criteria include estimation of landform potential (in terms of its capacity to contain archaeological traces) and assessing the value to any archaeological traces (in terms of their attributes or their capacity to be construed as evidence, given that evidence is not given but constructed by the investigator). Due to the urban setting of the study area these criteria will most probably not come into play in this study.

Estimating site potential

Table 4 (below) is a classification of landforms and visible archaeological traces used for estimating the potential of archaeological sites (after J. Deacon and, National Monuments Council). Type 3 sites tend to be those with higher archaeological potential, but there are notable exceptions to this rule, for example the renowned rock engravings site Driekopseiland near Kimberley which is on landform L1 Type 1 –

normally a setting of lowest expected potential. It should also be noted that, generally, the older a site the poorer the preservation, so that sometimes any trace, even of only Type 1 quality, could be of exceptional significance. In light of this, estimation of potential will always be a matter for archaeological observation and interpretation.

Table 4. Classification of landforms and visible archaeological traces for estimating the potential for archaeological sites (after J. Deacon, NMC as used in Morris)

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

Table 5. Site attributes and value assessment (adapted from Whitelaw 1997 as used in Morris)

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

Assessing site value by attribute

Table 5 is adapted from Whitelaw (1997), who developed an approach for selecting sites meriting heritage recognition status in KwaZulu-Natal. It is a means of judging a site's archaeological value by ranking the relative strengths of a range of attributes (given in the second column of the table). While aspects of this matrix remain qualitative, attribute assessment is a good indicator of the general

archaeological significance of a site, with Type 3 attributes being those of highest significance.

SIGNIFICANCE EVALUATION

As the criteria set out in the National Heritage Resources Act tend to approach heritage from the level of 'national' significance and few heritage sites and features fall within this category, a second set of criteria are used to determine the regional and local significance of heritage sites. Three sub-categories are used to determine this significance:

- (a) Historical significance – this category determines the social context in which a heritage site and resource need to be assessed. These criteria focus on the history of the 'place' in terms of its significance in time and the role they played in a particular community (human context).
- (b) Architectural significance – The objective of this set of criteria is to assess the artefactual significance of the heritage resource, its physical condition and meaning as an 'object'.
- (c) Spatial significance – focuses on the physical context in which the object and place exists and how it contributed to the landscape, the region, the precinct and neighbourhood.

HISTORIC SIGNIFICANCE

No	Criteria	Significance Rating
1	Are any of the identified sites or buildings associated with a historical person or group? No	-
2	Are any of the buildings or identified sites associated with a historical event? No	-
3	Are any of the identified sites or buildings associated with a religious, economic social or political or educational activity? No	-
4	Are any of the identified sites or buildings of archaeological significance? None of the buildings identified are of archaeological importance	-
5	Are any of the identified buildings or structures older than 60 years? No	-

ARCHITECTURAL SIGNIFICANCE

No	Criteria	Rating
1	Are any of the buildings or structures an important example of a building type? No	-
2	Are any of the buildings outstanding examples of a particular style or period? No	-
3	Do any of the buildings contain fine architectural details and reflect exceptional craftsmanship? No	-
4	Are any of the buildings an example of an industrial, engineering or technological development? No	-
5	What is the state of the architectural and structural integrity of the building? N/A	-
6	Is the building's current and future use in sympathy with its original use (for which the building was designed)? N/A	-
7	Were the alterations done in sympathy with the original design? N/A	-

8	Were the additions and extensions done in sympathy with the original design? N/A	-
9	Are any of the buildings or structures the work of a major architect, engineer or builder? No.	-

SPATIAL SIGNIFICANCE

Even though each building needs to be evaluated as single artefact the site still needs to be evaluated in terms of its significance in its geographic area, city, town, village, neighbourhood or precinct. This set of criteria determines the spatial significance.

No	Criteria	Rating
1	Can any of the identified buildings or structures be considered a landmark in the town or city? No	-
2	Do any of the buildings contribute to the character of the neighborhood? No	-
3	Do any of the buildings contribute to the character of the square or streetscape? No	-
4	Do any of the buildings form part of an important group of buildings? No	-

FINDINGS

After investigation of the study area it was determined that none of the formal structures had any heritage value.

BUILT ENVIRONMENT STRUCTURES

The following built environment structures were noted on the study areas.



Figure 11. Formalised buildings on neighbouring property (poultry houses)



Figure 12. Pump house and crusher conveyor located within the study area

The study is well represented within the cadastral survey series. Maps from 2006, 2002, 1995, 1976, 1957 and 1944 could be found for the area. These maps proved valuable in determining the age of the different structures located on site.

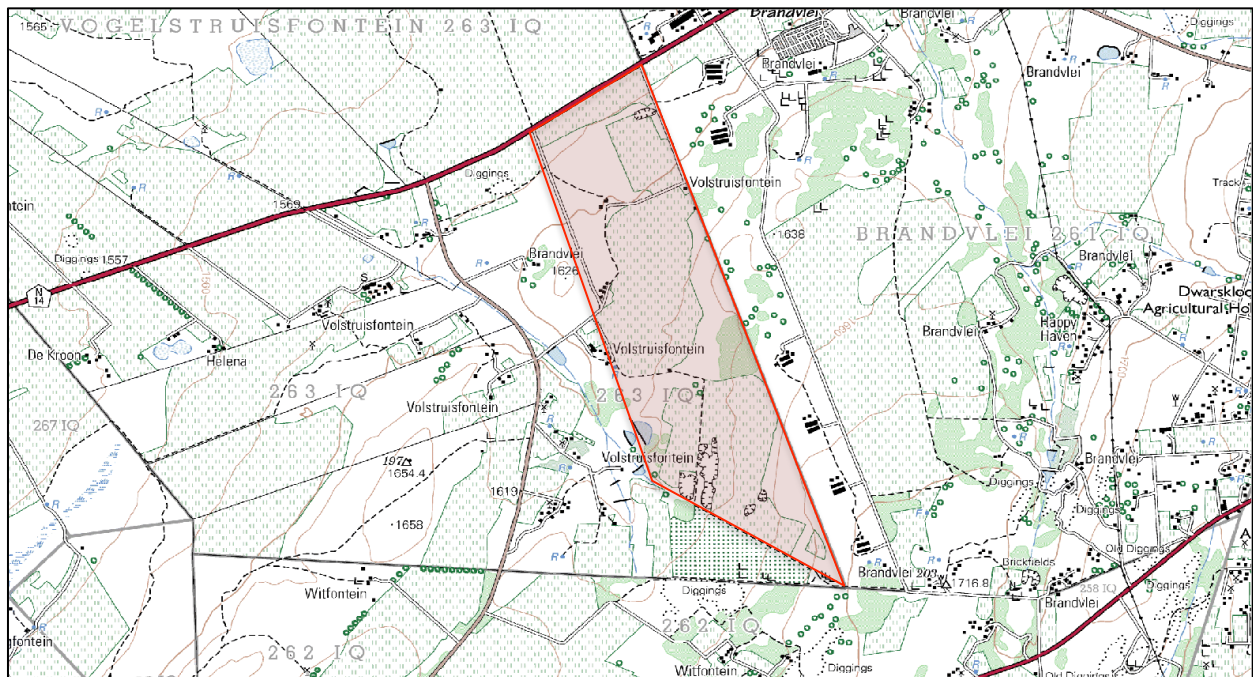


Figure 13. 2006 Mapset (2627 BA)

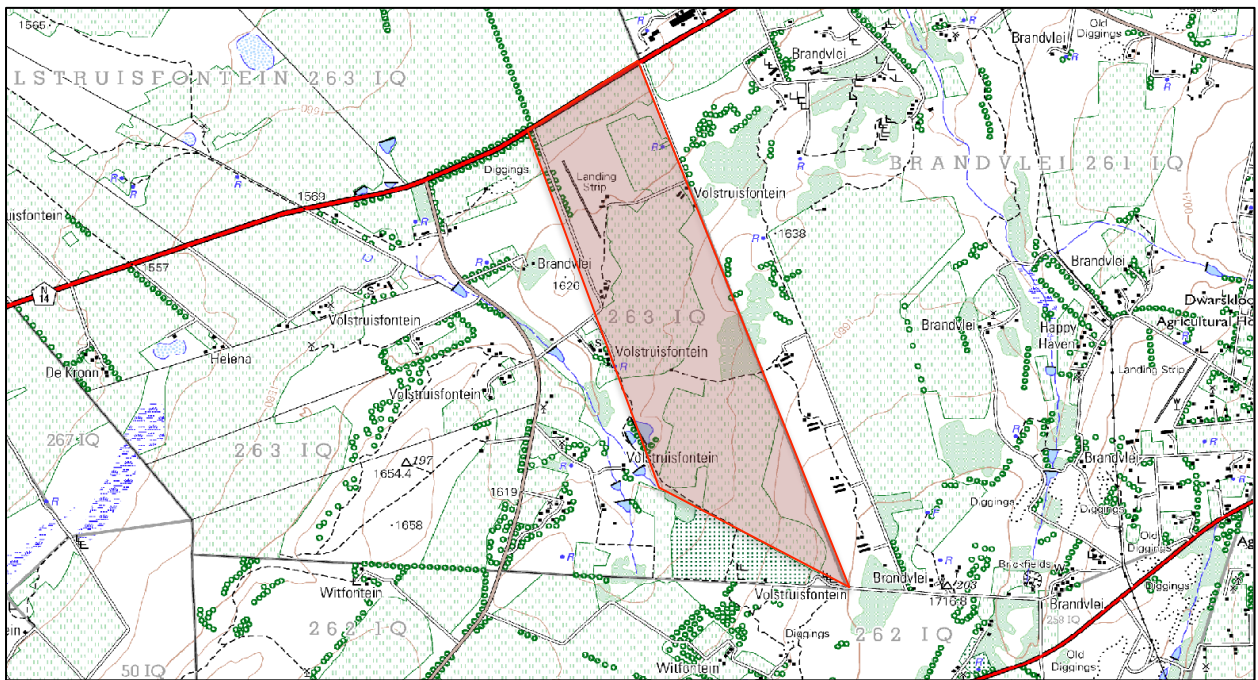


Figure 14. 2002 Mapset (2627 BA)

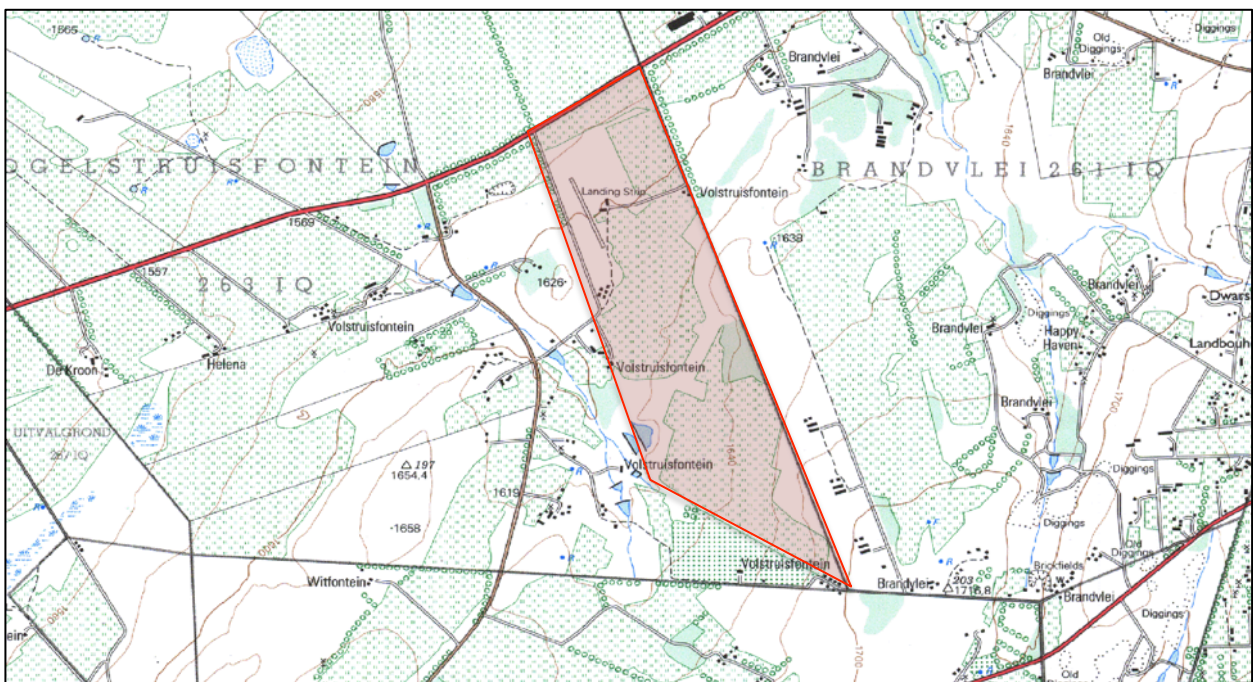


Figure 15. 1995 Mapset (2627 BA)

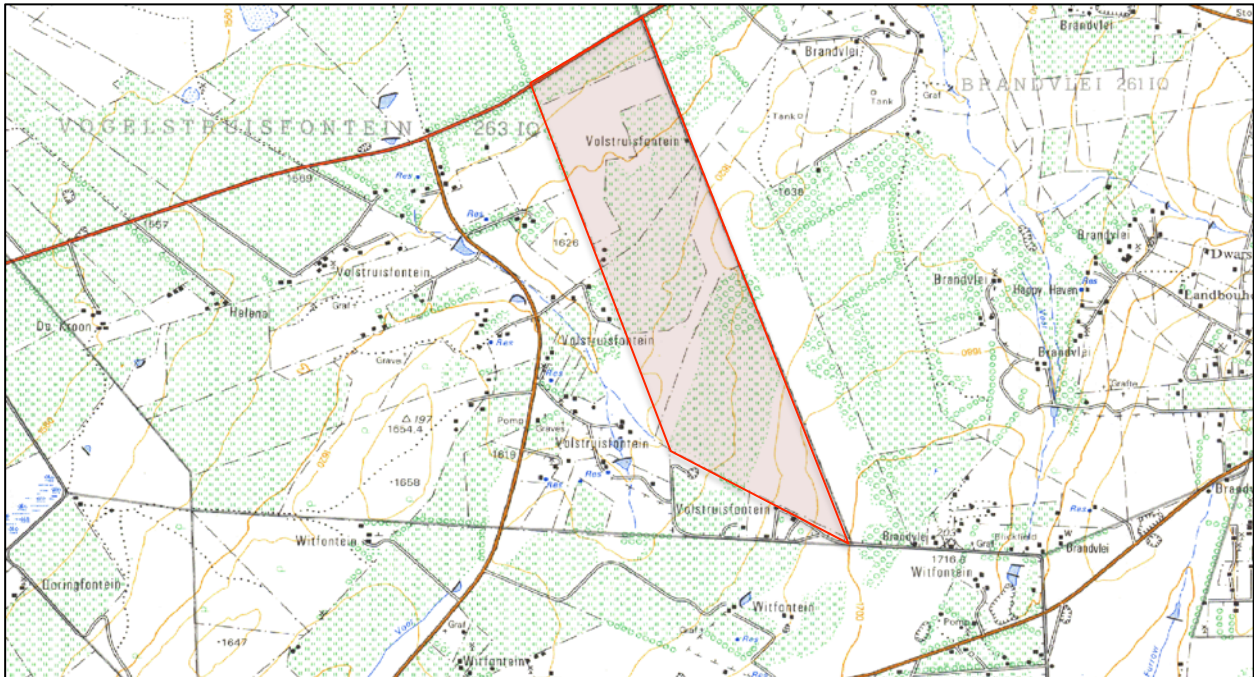


Figure 16. 1976 Mapset

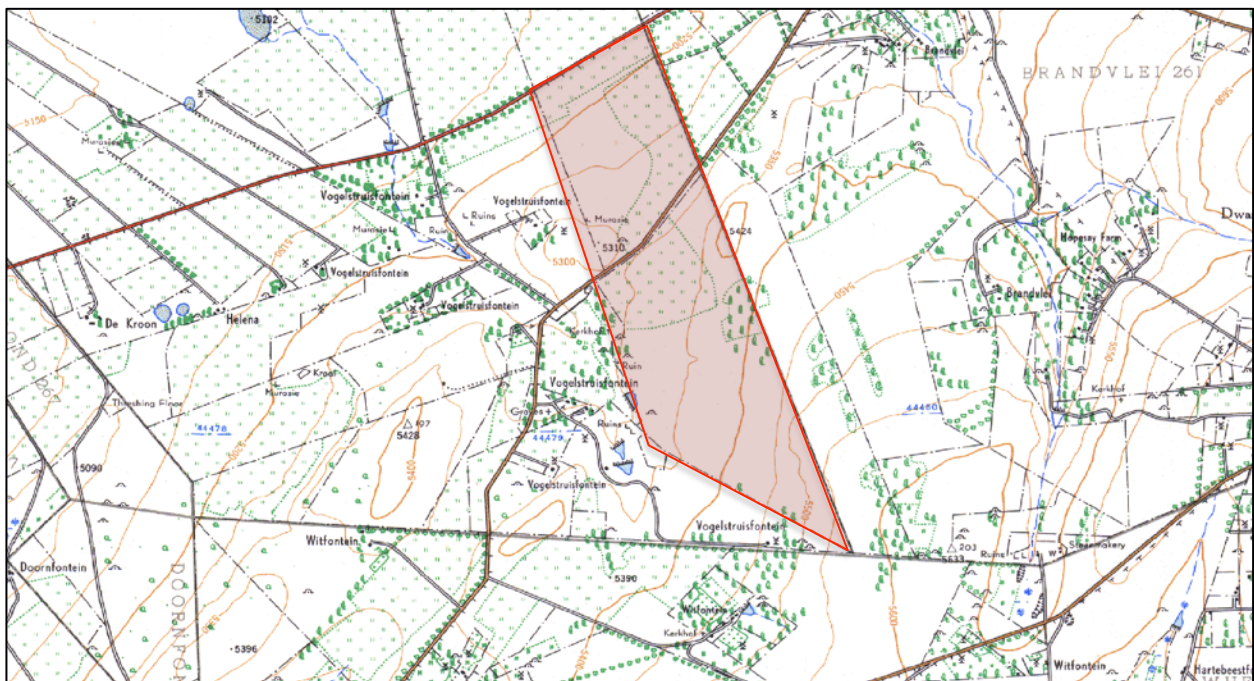


Figure 17. 1957 Mapset

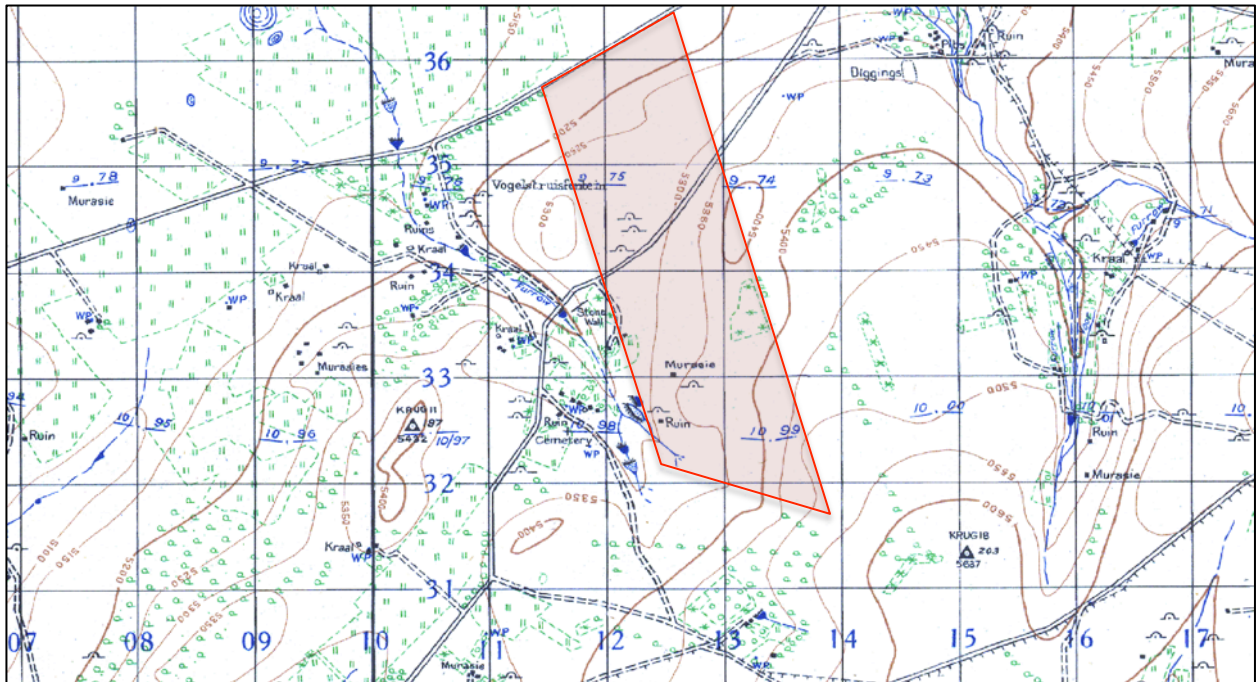


Figure 18. 1944 Mapset

The 1944 mapset (above), interestingly indicates the occurrence of “native huts” on the property. These structures has long since been demolished, however it would be prudent to make provision for the possibility of unmarked graves being found in this area. Recommendations for the mitigation of such a scenario is given at the end of this report.

PALEONTOLOGICAL FINDINGS

An investigation of the underlying bedrock for the study area indicates that it lies over two types of the Wes Rand Group Suite and specifically sections of Hospital Hill Subgroup (indicated in blue on the map below and Government Subgroup (beige). These all fall under the Witwatersrand Supergroup.

The deposits comprise mostly of shales and quartzites and these Precambrian deposits are not known to contain fossils. It is therefore unlikely that the proposed development would have an impact on any paleontological deposits (McCarthy 2006).

It should further be noted that the proposed mining activity would only be mining alluvial sand to a maximum depth of 12m. Due to the nature of this activity the bedrock will not be disturbed and there is therefore no chance of any impact on paleontological resources.

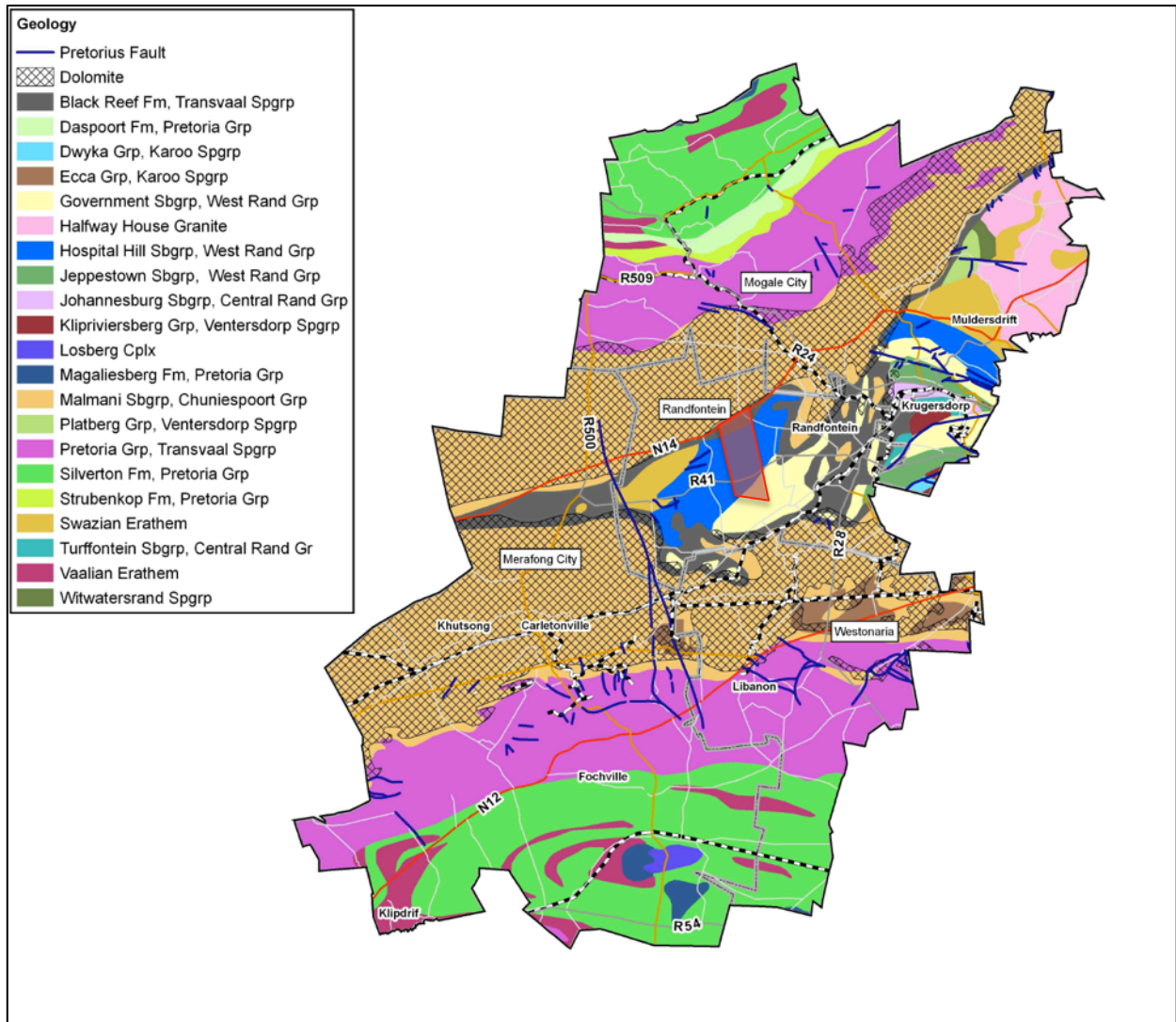


Figure 19. Geological map of Gauteng with site indicated in red

ARCHAEOLOGICAL FINDS

No sites of archaeological significance could be identified on the proposed development site. Due to the long history of occupation in this area and the occurrence of earlier dwellings, it is still possible that unmarked or damaged gravesites could be unearthed during the mining activities. There are practically no useful way of determining the occurrence of such sites and these should be mitigated on an ad hoc basis if they occur as per the recommendations in this report.

IMPACT EVALUATION

This HIA Methodology assists in evaluating the overall effect of a proposed activity on the heritage environment. The determination of the effect of a heritage impact on a heritage parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the heritage practitioner through the process of the heritage impact assessment. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts.

DETERMINATION OF SIGNIFICANCE OF IMPACTS

Significance is determined through a synthesis of impact characteristics, which include context, and intensity of an impact. Context refers to the geographical scale i.e. site, local, national or global whereas

Intensity is defined by the severity of the impact e.g. the magnitude of deviation from background conditions, the size of the area affected, the duration of the impact and the overall probability of occurrence.

Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

IMPACT RATING SYSTEM

Impact assessment must take account of the nature, scale and duration of effects on the heritage environment whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages:

- planning
- construction
- operation
- decommissioning

Where necessary, the proposal for mitigation or optimisation of an impact will be detailed. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

RATING SYSTEM USED TO CLASSIFY IMPACTS

The rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. Impacts have been consolidated into one rating. In assessing the significance of each issue the following criteria (including an allocated point system) is used:

NATURE		
Include a brief description of the impact of the heritage parameter being assessed in the context of the project. This criterion includes a brief written statement of the heritage aspect being impacted upon by a particular action or activity.		
GEOGRAPHICAL EXTENT		
This is defined as the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment of a project in terms of further defining the determined.		
1	Site	The impact will only affect the site
2	Local/district	Will affect the local area or district
3	Province/region	Will affect the entire province or region
4	International and National	Will affect the entire country
PROBABILITY		
This describes the chance of occurrence of an impact		

1	Unlikely	The chance of the impact occurring is extremely low (Less than a 25% chance of occurrence).
2	Possible	The impact may occur (Between a 25% to 50% chance of occurrence).
3	Probable	The impact will likely occur (Between a 50% to 75% chance of occurrence).
4	Definite	Impact will certainly occur (Greater than a 75% chance of occurrence).
REVERSIBILITY		
This describes the degree to which an impact on a heritage parameter can be successfully reversed upon completion of the proposed activity.		
1	Completely reversible	The impact is reversible with implementation of minor mitigation measures
2	Partly reversible	The impact is partly reversible but more intense mitigation measures are required.
3	Barely reversible	The impact is unlikely to be reversed even with intense mitigation measures.
4	Irreversible	The impact is irreversible and no mitigation measures exist.
IRREPLACEABLE LOSS OF RESOURCES		
This describes the degree to which heritage resources will be irreplaceably lost as a result of a proposed activity.		
1	No loss of resource.	The impact will not result in the loss of any resources.
2	Marginal loss of resource	The impact will result in marginal loss of resources.
3	Significant loss of resources	The impact will result in significant loss of resources.
4	Complete loss of resources	The impact is result in a complete loss of all resources.
DURATION		
This describes the duration of the impacts on the heritage parameter. Duration indicates the lifetime of the impact as a result of the proposed activity		
1	Short term	The impact and its effects will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase (0 – 1 years), or the impact and its effects will last for the period of a relatively short construction period and a limited recovery time after construction, thereafter it will be entirely negated (0 – 2 years).
2	Medium term	The impact and its effects will continue or last for some time after the construction phase but will be mitigated by direct human action or by natural processes thereafter (2 – 10 years).
3	Long term	The impact and its effects will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter (10 – 50 years).

4	Permanent	The only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or such a time span that the impact can be considered transient (Indefinite).
CUMULATIVE EFFECT		
This describes the cumulative effect of the impacts on the heritage parameter. A cumulative effect/impact is an effect, which in itself may not be significant but may become significant if added to other existing or potential impacts emanating from other similar or diverse activities as a result of the project activity in question.		
1	Negligible Cumulative Impact	The impact would result in negligible to no cumulative effects
2	Low Cumulative Impact	The impact would result in insignificant cumulative effects
3	Medium Cumulative impact	The impact would result in minor cumulative effects
4	High Cumulative Impact	The impact would result in significant cumulative effects
INTENSITY / MAGNITUDE		
Describes the severity of an impact		
1	Low	Impact affects the quality, use and integrity of the system/component in a way that is barely perceptible.
2	Medium	Impact alters the quality, use and integrity of the system/component but system/ component still continues to function in a moderately modified way and maintains general integrity (some impact on integrity).
3	High	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component is severely impaired and may temporarily cease. High costs of rehabilitation and remediation.
4	Very high	Impact affects the continued viability of the system/component and the quality, use, integrity and functionality of the system or component permanently ceases and is irreversibly impaired (system collapse). Rehabilitation and remediation often impossible. If possible rehabilitation and remediation often unfeasible due to extremely high costs of rehabilitation and remediation.
SIGNIFICANCE		

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. This describes the significance of the impact on the heritage parameter. The calculation of the significance of an impact uses the following formula:

(Extent + probability + reversibility + irreplaceability + duration + cumulative effect) x magnitude/intensity.

The summation of the different criteria will produce a non weighted value. By multiplying this value with the magnitude/intensity, the resultant value acquires a weighted characteristic which can be measured and assigned a significance rating.

Points	Impact Significance Rating	Description
6 to 28	Negative Low impact	The anticipated impact will have negligible negative effects and will require little to no mitigation.
6 to 28	Positive Low impact	The anticipated impact will have minor positive effects.
29 to 50	Negative Medium impact	The anticipated impact will have moderate negative effects and will require moderate mitigation measures.
29 to 50	Positive Medium impact	The anticipated impact will have moderate positive effects.
51 to 73	Negative High impact	The anticipated impact will have significant effects and will require significant mitigation measures to achieve an acceptable level of impact.
51 to 73	Positive High impact	The anticipated impact will have significant positive effects.
74 to 96	Negative Very high impact	The anticipated impact will have highly significant effects and are unlikely to be able to be mitigated adequately. These impacts could be considered "fatal flaws".
74 to 96	Positive Very high impact	The anticipated impact will have highly significant positive effects.

ANTICIPATED IMPACT OF THE DEVELOPMENT

IMPACT TABLE FORMAT	
Heritage component	<i>Unmarked gravesites</i>
Issue/Impact/Heritage Impact/Nature	<i>Development of Vogelstruisfontein Sand Mine</i>
<i>Extent</i>	<i>Local (2)</i>
<i>Probability</i>	<i>Definite (4)</i>
<i>Reversibility</i>	<i>Partly reversible (2)</i>
<i>Irreplaceable loss of resources</i>	<i>Total loss of resources (5)</i>
<i>Duration</i>	<i>Medium term (2)</i>
<i>Cumulative effect</i>	<i>Negligible cumulative effect (1)</i>

<i>Intensity/magnitude</i>	<i>Medium (2)</i>	
<i>Significance Rating of Potential Impact</i>	<i>32 points. The impact will have a medium negative effect rating.</i>	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	2
Probability	4	1
Reversibility	2	1
Irreplaceable loss	2	1
Duration	2	2
Cumulative effect	1	1
Intensity/magnitude	2	1
Significance rating	32 (medium negative)	8 (low negative)
Mitigation measure	<i>If graves are inadvertently uncovered during the mining process, the recommendations and steps as outlined in this report should be followed for their mitigation</i>	

RESOURCE MANAGEMENT RECOMMENDATIONS

Although unlikely, sub-surface remains of heritage sites could still be encountered during the construction activities associated with the project. Such sites would offer no surface indication of their presence due to the high state of alterations in some areas as well as heavy plant cover in other areas. The following indicators of unmarked sub-surface sites could be encountered;

- Ash deposits (unnaturally grey appearance of soil compared to the surrounding substrate)
- Bone concentrations, either animal or human
- Ceramic fragments such as pottery shards either historic or pre-contact
- Stone concentrations of any formal nature

Although no sites of heritage significance were identified within the proposed study area, the following recommendations are given should any sub-surface remains of heritage sites be identified as indicated above;

- All operators of excavation equipment should be made aware of the possibility of the occurrence of sub-surface heritage features and the following procedures should they be encountered.
- All construction in the immediate vicinity (50m radius of the site should cease).
- The heritage practitioner should be informed as soon as possible.
- In the event of obvious human remains the SAPS should be notified.
- Mitigative measures (such as refilling etc.) should not be attempted.
- The area in a 50m radius of the find should be cordoned off with hazard tape.
- Public access should be limited.
- The area should be placed under guard.
- No media statements should be released until such time as the heritage practitioner has had sufficient time to analyse the finds.

CONCLUSION

No sites of archaeological, meteorite or paleontological value or significant built environment structures could be identified on the study area. The site has been subjected to extensive alteration in the past through mining, erosion and agriculture. The current area is distinctly devoid of heritage sites. The occurrence of earlier hut structures according to historic map sets could indicate the possibility of unmarked graves in the area.

Due to the fact that the mining will only focus on the extraction of alluvial sand and will not be intrusive to the bedrock, it is not anticipated that there will be any effect on the palaeontology of the site. The site is also underlain by non-fossiliferous bedrock formations that are Precambrian.

Provided the recommendations in this report is adhered to there is no reason why this development may not continue from a heritage management point of view.

REFERENCES CITED & RESEARCHED

- Arts and Culture in the Ekurhuleni Metro Area, n.d. Published by the Ekurhuleni Metropolitan Municipality.
- Arts and Culture Task Group, (1995), Draft report for the Ministry of Arts, Culture, Science and Technology. Pretoria: ACTAG.
- Bewsher, P K, & De Jong, R C, (1997), Ecotourism and cultural resource management. Document prepared for the SA Wildlife College. Pretoria: Centre for Ecotourism.
- Canadian Parks Service, (1989). Proposed policy.
- Cultural Institutions Act, No 119 of 1998.
- De Jong, R.C., (1992). Draft policy guidelines for cultural resource management in nature conservation and forestry areas in South Africa. Pretoria: National Cultural History Museum (unpublished)
- Department of Arts, Culture, Science and Technology, (1996). White Paper on Arts, Culture and Heritage. Pretoria: SA Communication Service.
- DEAT, (1996). White Paper on the Development and Promotion of Tourism in South Africa. Pretoria: The Department.
- DEAT, (1998). A national strategy for Integrated Environmental Management in South Africa. Discussion document. Pretoria: The Department.
- DEAT, (1998). White Paper on environmental management policy for South Africa. Government Gazette, Vol 395, No 18894, 15 May 1998.
- Department of Public Works, (1998), White Paper 1997. Public Works towards the 21st century. Government Gazette, Vol 391, No 18616, 14 January 1998.
- *Cultural Heritage 146 Ekurhuleni SoER 2003*
- Entries on towns in the *Standard Encyclopedia of Southern Africa*, published by Nasou, 1970-1976 (11 volumes).
- Eskom Heritage website
- Files in Gauteng Office of SAHRA, Northwards, Parktown, Johannesburg
- Galla, A, (1996), Shifting the paradigm. A plan to diversify heritage practice in South Africa. Cape Town: South African Museums Association.
- Gauteng Department of Economic Affairs and Finance, (1997). Gauteng Tourism White Paper. Johannesburg: The Department.
- Hall, C.M, & McArthur, S. (eds), (1996). Heritage management in Australia and New Zealand. Draft publication.
- Harrison, R, (1994). Manual of heritage management. Oxford: Butterworth Heinemann.
- Jote, K, (1994). International legal protection of cultural heritage. Stockholm: Juristförlaget.
- Killick, D. 2004. Review Essay: "What Do We Know About African Iron Working?" *Journal of African Archaeology*. Vol 2 (1) pp. 135–152
- McCarthy, T.S. 2006. The Witwatersrand Supergroup. In: Johnson MR, Anhaeusser and Thomas RJ (Eds). *The Geology of South Africa*. Geological Society of South Africa, Johannesburg/Council

for Geoscience, Pretoria. pp 155-186.

- McCarthy, T.S. and Rubidge, B.S. 2005. The story of Earth and Life – a southern African perspective on the 4.6 billion year journey. Struik Publishers, Cape Town. pp 333.
- Mason, R. (1986). Origins of Black People of Johannesburg and the Southern Western Central Transvaal AD350-1880. Occasional Paper No. 16 of the Archaeological Research Unit.
- Musa, (1994). Museums for South Africa: Intersectoral investigation for national policy. Pretoria: MUSA Secretariat.
- National Heritage Council Act, No 11 of 1999.
- National Heritage Resources Act, No 25 of 1999.
- National Research Foundation, Nexus database of current and completed research projects
- Republic of South Africa, (1996). Constitution of the Republic of South Africa, Act 108 of 1996. Government Gazette, Vol 378, No 17678, 18 December 1996.
- Ross, M. (1996). Planning and the heritage. Policy and procedures. Second edition. London: E & FN Spon.
- SAHRA website <http://www.sahra.org.za>
- Stark, F, (1986). Germiston: The heart of South Africa. Germiston: Felstar Publishing.
- The City of Germiston: Official Guide, (1957). Germiston: Publicity Association.
- UNESCO, (1983). Conventions and recommendations concerning the protection of the cultural heritage. Paris: UNESCO.
- US National Parks Service, (1988). Management Policies.
- Webster, S, (1994). The Brakpan Story. Brakpan: Town Council.