

**PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT
ASSESSMENT REPORT FOR PROPOSED PROSPECTING
RIGHT APPLICATION WITH BULK SAMPLING ON
PORTIONS 4,6&10 OF THE FARM ZUIKERBOSFONTEIN
151 IQ AND PORTION 2,27-29,33,34,36,40-44 OF THE
FARM KOESTERFONTEIN 45 IQ, PORTION 2&3 OF THE
FARM MIGALSOOD 152 IQ, AND PORTION 2 OF THE
FARM VAALBANK 512 IQ SITUATED IN THE MAGISTERIAL
DISTRICT OF KRUGERSDORP IN GAUTENG PROVINCE**

Milo, T.

INTEGRATED SPECIALIST SERVICES (PTY) LTD

Document Information

Item	Description
Proposed development and location	Proposed Prospecting with bulk sampling on Portion 4,6&10 of the Farm Zuikerbosfontein 151 IQ , Portion 6 & 7 of the Farm Golden Valley 621 IQ and Portion 2,27-29,33,34,36,40-44 of the Farm Koesterfontein 45 IQ, Portion 2&3 of the Farm Migalsood 152 IQ, and Portion 2 of the Farm Vaalbank 512 IQ (Application 2) located in the Magisterial District of Krugersdorp in Gauteng Province
Purpose of the study	To carry out a Heritage Impact Assessment to determine the presence/absence of cultural heritage sites and the impact of the proposed prospecting with bulk sampling on various portions of the Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ referred to as Application 2.
1:50 000 Topographic Map	2627 AB
Coordinates	See Figure 1 and 2
Municipalities	Mogale City Local Municipality
Predominant land use of surrounding area	Agriculture, commercial residential and mining.
Applicant	Tau Industries (Pty) Ltd
Reference No.	GP30/5/1/1/2/10504PR
EAP	Lufuno Muthsathama: Joan Projects and Construction P.O. Box 4147, Honeydew, 2040 Tel: 011 791 5032 Email: joanprojects@gmail.com
Heritage Consultant	Integrated Specialist Services (Pty) Ltd 65 Naalدهout Avenue, Centurion, 0157 Tel: 011 037 1565/ 071 685 9247 Email: trust@issolutions.co.za
Author	Trust Mlilo (Archaeology and Heritage Specialist)
Date of Report	28/ 08/ 2018

NATIONAL LEGISLATION AND REGULATIONS GOVERNING THIS REPORT

This is a specialist report' and is compiled in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014.

DECLARATION OF INDEPENDENCE

In terms of Chapter 5 of the National Environmental Management Act of 1998 specialists involved in Impact Assessment processes must declare their independence.

I, **Trust Mlilo**, do hereby declare that I am financially and otherwise independent of the client and their consultants, and that all opinions expressed in this document are substantially my own, notwithstanding the fact that I have received fair remuneration from the client for preparation of this report.

Expertise:

Trust Mlilo, MA. (Archaeology), BA Hons, PDGE and BA & (Univ. of Pretoria) ASAPA (Professional member) with more than 15 years of experience in archaeological and heritage impact assessment and management. Mlilo is an accredited member of the Association for Southern African Professional Archaeologists (ASAPA), Amafa akwaZulu Natali and Eastern Cape Heritage Resources Agency (ECPHRA). He has conducted more than hundred AIA/HIA Studies, heritage mitigation work and heritage development projects over the past 15 years of service. The completed projects vary from Phase 1 and Phase 2 as well as heritage management work for government, parastatals (Eskom) and several private companies such as BHP Billiton, Rhino Minerals.

Independence

The views expressed in this document are the objective, independent views of Mr Trust Mlilo and the survey was carried out under Joan Construction and Projects (Pty) Ltd. Integrated Specialist Services (Pty) Ltd has no any business, personal, financial or other interest in the proposed development apart from fair remuneration for the work performed.

Conditions relating to this report

The content of this report is based on the author's best scientific and professional knowledge as well as available information. Integrated Specialist Services (Pty) Ltd reserves the right to modify the report in any way deemed fit should new, relevant or previously unavailable or undisclosed information become known to the author from on-going research or further work in this field, or pertaining to this investigation.

This report must not be altered or added to without the prior written consent of the author and Joan Construction and Projects (Pty) Ltd. This also refers to electronic copies of the report which are supplied for the purposes of inclusion as part of other reports, including main reports. Similarly, any recommendations, statements or conclusions drawn from or based on this report must make reference to this report. If these form part of a main report relating to this investigation or report, this report must be included in its entirety as an appendix or separate section to the main report.

Authorship: This AIA/HIA Report has been prepared by Mr Trust Mlilo (Professional Archaeologist). The report is for the review of the Heritage Resources Agency (PHRA).

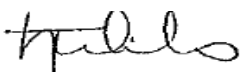
Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the SAHRA Regulations and Guidelines as to the authorisation of proposed prospecting right application with bulk sampling being proposed by Tau Industries (Pty) Ltd.

Signed by



20/ 08/ 2018

Acknowledgement

The author acknowledges Joan Construction and Projects (Pty) Ltd and Tau Industries (Pty) Ltd for their assistance with project information, and the associated project BID as well as responding to technical queries related to the project. The author also acknowledges the Public Participation Practitioner for arranging access to various farms along the proposed prospecting site. In addition, we would like to thank all the land owners such as Jaco du Toit (073327 7087) who provided access to their farms and also provided vital information regarding existence of any heritage resources within their respective farms.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	VIII
ABBREVIATIONS.....	XI
KEY CONCEPTS AND TERMS.....	XII
BACKGROUND	- 15 -
DESCRIPTION OF THE PROPOSED PROJECT	- 16 -
LOCATION OF THE PROPOSED DEVELOPMENT	- 16 -
2 LEGAL REQUIREMENTS.....	- 20 -
ASSESSING THE SIGNIFICANCE OF HERITAGE RESOURCES	- 21 -
CATEGORIES OF SIGNIFICANCE	- 22 -
AESTHETIC VALUE:	- 23 -
HISTORICAL VALUE:.....	- 23 -
SCIENTIFIC VALUE:	- 23 -
SOCIAL VALUE:.....	- 23 -
FORMALLY PROTECTED SITES	- 23 -
GENERAL PROTECTION	- 23 -
SIGNIFICANCE RATING ACTION.....	- 24 -
OTHER RELEVANT LEGISLATIONS	- 27 -
TERMS OF REFERENCE.....	- 27 -
3 METHODOLOGY	- 34 -
3.1 ASSUMPTIONS AND LIMITATIONS	- 35 -
3.2 CONSULTATION	- 36 -
4 CULTURE HISTORY BACKGROUND OF THE PROJECT AREA	- 36 -
STONE AGE ARCHAEOLOGY	- 36 -
INTANGIBLE HERITAGE.....	- 38 -
SAHRIS DATABASE AND IMPACT ASSESSMENT REPORTS IN THE PROPOSED PROJECT AREA	- 39 -
5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY.....	- 40 -
ARCHAEOLOGICAL SITE	- 41 -
BUILDINGS AND STRUCTURES OLDER THAN 60 YEARS.....	- 48 -
BURIAL GROUNDS AND GRAVES	- 60 -
HISTORICAL MONUMENTS AND MEMORIALS.....	- 62 -
BATTLE FIELDS	- 62 -

PALAEONTOLOGY.....	- 62 -
ARCHAEO-METALLURGY, PREHISTORIC MINING AND MINING HERITAGE	- 63 -
NATURAL HERITAGE	- 65 -
VISUAL IMPACTS	- 65 -
MITIGATION	- 65 -
6 CUMMULATIVE IMPACTS	- 66 -
7 ASSESSMENT OF SIGNIFICANCE.....	- 68 -
8 STATEMENT OF SIGNIFICANCE	- 72 -
9 DISCUSSION.....	- 74 -
10 RECOMMENDATIONS.....	- 75 -
11 CONCLUDING REMARKS	- 77 -
12 BIBLIOGRAPHY	- 78 -
APPENDIX 1: LIST OF FARMERS CONSULTED DURING THE SURVEY.....	- 83 -
APPENDIX 2: HERITAGE MANAGEMENT PLAN INPUT INTO THE MINING DEVELOPMENT PROJECT EMP.....	- 84 -
APPENDIX 3: HERITAGE MITIGATION MEASURES TABLE	- 85 -
APPENDIX 4: LEGAL BACKGROUND IN SOUTH AFRICA	- 86 -

TABLE OF PLATES [PHOTOGRAPHS]

Plate 1: Photo 1: View of some cultivated sections of the proposed prospecting sites (Photograph © by Author 2018). ..	- 28 -
Plate 2: Photo 2: View of some sections covered by vegetation cover(Photograph © by Author 2018).	- 28 -
Plate 3: Photo 3: View of some areas which were burn during the survey (Photograph © by Author 2018).	- 29 -
Plate 4: Photo 4: View of sections which fall on rocky areas (Photograph © by Author 2018)	- 29 -
Plate 5: Photo 5: View of prospecting area (Photograph © by Author 2018).....	- 30 -
Plate 6: Photo 6: View of prospecting site(Photograph © by Author 2018).....	- 30 -
Plate 7: Photo 7: View of prospecting area (Photograph © by Author 2018). Note the blue gums on the background.....	- 31 -
Plate 8: Photo 8: View of prospecting site (Photograph © by Author 2018)	- 31 -
Plate 9: Photo 9: View of prospecting site (Photograph © by Author 2018). Note that burnt areas provided high visibility of potential archaeological signatures.	- 32 -
Plate 10: Photo 10: View of proposed prospecting site (Photograph © by Author 2018). Note that a significant extent of the proposed prospecting site was burnt at the time of this survey.	- 32 -
Plate 11: Photo 11: An aerial view of the prospecting sites (Photograph © by Author 2018).	- 33 -
Plate 12: Photo 12: View of prospecting site seen from the east (Photograph © by Author 2018).	- 33 -

Plate 13: Photo 13: View of the historical archaeological site seen from the west on the Farm Koesterfontein 45 IQ (Photograph © by Author 2018). Not that the other section of the site is located across the river marked by badly done river bank. ... - 42 -

Plate 14: Photo 14: A closer view of the site seen of the western side of the river (Photograph © by Author 2018) - 42 -

Plate 15: Photo 15: Closer view of some structures at the site (Photograph © by Author 2018) - 43 -

Plate 16: Photo 16: View of one structure closer to the river (Photograph © by Author 2018) - 43 -

Plate 17: Photo 17: View of one structure which have traces of Zama Zamas sheltering in the structure (Photograph © by Author 2018) - 44 -

Plate 18: Photo 18: View of one structure with vegetation overgrowth affecting some walls (Photograph © by Author 2018) .. - 44 -

Plate 19: Photo 19: View of a structure with collapsing walls possibly as a result of livestock passing through on their way to the river (Photograph © by Author 2018) - 45 -

Plate 20: Photo 20: View of isolated structure located on the top of the slope (Photograph © by Author 2018) - 45 -

Plate 21: Photo 21: View of isolated structure on the top of the slope overlooking the river (Photograph © by Author 2018) ... - 46 -

Plate 22: Photo 22: View of a structure located approximately 80m from the rest (Photograph © by Author 2018) - 46 -

Plate 23: Photo 23: View of ab (Photograph © by Author 2018) - 47 -

Plate 24: Photo 24: View of an isolated stone structure on the top of the slope (Photograph © by Author 2018) - 47 -

Plate 25: Photo 25: View of structure with trees which are likely to destroy the walls should they be an accidental fire (Photograph © by Author 2018) - 48 -

Plate 26: Photo 26: View of abandoned and vandalised farm house in the vicinity of Portion 11 and 22 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018) - 51 -

Plate 27: Photo 27: View of abandoned historical farm house along Road R100r (Photograph © by Author 2018) - 51 -

Plate 28: Photo 28: View of a historical farm house in the project area (Photograph © by Author 2018) - 52 -

Plate 29: Photo 29: View of a historical farm house within the Farm Koesterfontein 45 IQ (Photograph © by Author 2018) ... - 52 -

Plate 30: Photo 30: View of abandoned and dilapidated farmstead with several brick structures (Photograph © by Author 2018) - 53 -

Plate 31: Photo 31: View of abandoned farm house and structures on the bank of the Blaauwbank River (Photograph © by Author 2018) - 53 -

Plate 32: Photo 32: View of some of the standing structures at the abandoned farmstead (Photograph © by Author 2018) ... - 54 -

Plate 33: Photo 33: View of detached huts from the main farmstead (Photograph © by Author 2018) - 54 -

Plate 34: Photo 34: View of one of the occupied historical houses (Photograph © by Author 2018). Note that most historical houses in the project area have been refurbished throughout the history of their occupation. - 55 -

Plate 35: Photo 35: View of a typical farmstead in the project area (Photograph © by Author 2018)..... - 55 -

Plate 36: Photo 36: View of abandoned rectangular stone houses associated with historical miners in the project area (Photograph © by Author 2018)..... - 56 -

Plate 37: Photo 37: View of a typical farmstead with several structures of varying ages (Photograph © by Author 2018)- 56 -

Plate 38: Photo 38: View of one of the several historical stone houses clustered along the Blaauwbank River (Photograph © by Author 2018)..... - 57 -

Plate 39: Photo 39: View of abandoned stone building (Photograph © by Author 2018). Note the precision on the walls associated with early European settlers..... - 57 -

Plate 40: Photo 40: View of abandoned stone walled cattle kraal (Photograph © by Author 2018)..... - 58 -

Plate 41: Photo 41: View of recent stone and mud house with cement floors (Photograph © by Author 2018)..... - 58 -

Plate 42: Photo 42: View of abandoned stone house with mud plaster (Photograph © by Author 2018)..... - 59 -

Plate 43: Photo 43: View of abandoned and vandalised farm house in the vicinity of Portion 11 and 22 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)..... - 59 -

Plate 44: Photo 44: View of graves at burial site ZBS1 (Photograph © by Author 2018)..... - 61 -

Plate 45: Photo 45: View of grave with inscribed headstone at ZBS1 (Photograph © by Author 2018)..... - 61 -

Plate 46: Photo 46: View of graves at ZBS1 seen from the north (Photograph © by Author 2018)..... - 62 -

Plate 47: Photo 47: View of disused mine pit within Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)..... - 63 -

Plate 48: Photo 48: View historical diggings within Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)..... - 64 -

Plate 49: Photo 49: View of historical diggings for slate with Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)..... - 64 -

Plate 50: Photo 50: View of historic diggings which are being re-mined illegal (Photograph © by Author 2018)..... - 65 -

TABLE OF FIGURES

Figure 1: Proposed prospecting sites (Joan construction and Projects 2018)..... - 17 -

Figure 2: Proposed prospecting sites (Joan Construction and Projects 2018). - 18 -

Figure 3: Heritage sensitivity map (ISS 2018). - 19 -

EXECUTIVE SUMMARY

Tau Industries (Pty) Ltd has lodged a prospecting right application with bulk sampling in respect of various Portions of the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ referred to as Application 2 situated in the Magisterial District of Krugersdorp in Gauteng Province. The proposed prospecting sites are located in the Magaliesberg area that is generally rich in archaeological and paleontological resources (See Figure 3), and any listed development in this area must take full cognizance of these heritage resources. Various national and provincial legislative arms mandate pre-development assessment to ensure the protection of these resources. The rich geological and agricultural resources of the project area have also led to numerous farming and mining activities that had robbed parts of the area's pristine environments. The implications of this observation are that whatever heritage resources that still exist in the area must be protected from any pending developments.

Archaeological resources in the general area earmarked for the current prospecting development stretches in to deep time. For example, the World Heritage Taung Fossil Site with australopithecines (eg *Australopithecus Africanus* dating to about 2.4 million years occur a little further to the south of development footprint. These australopithecines were gradually displaced by early hominid (*Homo Habilis*) that was later replaced by the early crude stone tool using hominid (*Homo erectus* around 1.8 million years ago). This marked the beginning of the Stone Age (ESA), which is not very wide spread in the study area. Nonetheless the area has isolated occurrences of the Middle Stone Age (MSA) industries associated with anatomically modern humans, *Homo sapiens* that replaced the ESA around 250000 years ago. The subsequent replacement of the MSA by Later Stone Age (LSA) occurred from about 20000 years ago and the new technology is also represented in isolated occurrences. The LSA is triggered a series of technological innovations and social transformations within these early hunter-gatherer societies that included the advent of rock art (paining and engravings), associated with the Khoisan communities. From this period onwards, there has not been significant reports of Early Iron Age (AD200 to 1000) sites in the study area until the post 15th century Ntsuanatsatsi-Uitkomsts (Nguni-speakers) and Olifantsfontein and Buispoort (Sotho-Tswana speakers) period of Late Iron Age that is characterized by stone walling. Key historical events relate to the 19th century encroachment of Boer Trekkers and Mfecane fleeing Mzilikazi's Ndebele people, as well as the aftermaths of Boer-Anglo and European-African military encounters that resulted in the establishment of several towns. These armed encounters left trails of historical battle grounds, cemeteries and unmarked graves that are protected by the South African heritage legislation and must not be disturbed without consultation and approval from national and provincial heritage agencies. Graves in general, and historical (over 60 years) graves in particular, are of high social significance and any development should preferably avoid them. Other historical mining activities relates to the gold rush triggered by the first discovery of gold in the Blaauwbank area. This place is now a protected

heritage site and there are also other known sites and structures in the study area, especially along the Magaliesberg Mountains. Small-scale gold manganese mining activities still continue to date and the associated pre-development studies have indicated low heritage sensitivity on some parts of the study area. All the same, archaeological resources are known to occur in buried contexts that may only be identifiable during prospecting, such that failure to detect them during field surveys is not absolute evidence of their absence and a clear procedure for reporting chance finds must be followed during prospecting.

This Archaeological and Heritage Impact Assessment (AIA/HIA) report has been prepared to address requirements of the National Heritage Resources Act, Act 25 of 1999, Section 38. Integrated Specialist Services (Pty) Ltd (ISS) was appointed by Joan Construction and Projects (Pty) Ltd to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed prospecting right application with bulk sampling in the Magisterial District of Krugersdorp in Gauteng Province. This report comprises an impact study on potential archaeological and cultural heritage resources that may be associated with the proposed prospecting development. This study was done as part of specialist input for the Environmental Impact Assessment exercise. The project information has been passed to ISS research team by Joan Construction and Projects EAP. Analysis of the archaeological, cultural heritage, environmental and historic contexts of the study area predicted that archaeological sites, cultural heritage sites, burial grounds or isolated artefacts were likely to be present on the affected landscape. The field study was undertaken to test this supposition and verify this prediction within the various proposed prospecting sites. The general project area is predominantly agriculture, tourism, residential and mining.

The report makes the following observations:

- The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed prospecting with bulk sampling.
- The Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ are very accessible and the field survey was effective enough to cover most sections of the project receiving environs. However, some sections had limited access due to thick vegetation cover and boundary fence lines.
- The immediate project area is predominantly agricultural, mining, commercial and residential.
- The study did not record any archaeological site within the proposed prospecting sites.

The report sets out the potential impacts of the proposed prospecting with bulk sampling on heritage matters and recommends appropriate safeguard and mitigation measures that are designed to reduce the impacts where appropriate. The Report makes the following recommendations:

- ❖ The prospecting teams must be inducted on the possibility of encountering archaeological resources that may be accidentally exposed during clearance and drilling at prospecting points prior to commencement of work on the site in order to ensure appropriate mitigation measures and that course of action is afforded to any chance finds.
- ❖ If archaeological materials are uncovered, work must cease immediately and the SAHRA/PHRA-G be notified and activity should not resume until appropriate management provisions are in place.
- ❖ The findings of this report, with approval of the SAHRA, may be classified as accessible to any interested and affected parties within the limits of the legislations.

This report concludes that the impacts of the proposed prospecting with bulk sampling on the cultural environmental values are not likely to be significant on the entire development site if the EMP includes recommended safeguard and mitigation measures identified in this report.

The assessment reached the following conclusions:

1. Some sections of the proposed prospecting sites have been ploughed over the years and the 1969 Edition of 1: 50 000 Topographic map mark them as cultivated.
2. Abandoned historic farm houses and structures are vulnerable because they are not occupied.
3. Occupied historical farm houses are safe from the impacts of the proposed prospecting with bulk sampling.

Recommendations

1. The proposed prospecting with bulk sampling may be allowed to proceed from a heritage perspective.
2. Site SWHMC 1 must be preserved *in situ* and further research on the site is recommended.
3. Abandoned historical farm houses must be preserved *in situ* since all buildings and structures older than 60 years are protected by Section 34 of the NHRA
4. Affected land owners must declare all buildings and structures older than 60 years located in their properties during public participation meetings.
5. The applicant must provide for a 25m buffer zone from the nearest prospecting point.
6. It is also advised that the Archaeology, Palaeontology and SAHRA Meteorites Unit is alerted when site work begins.
7. Strict and clear reporting procedures for chance findings must be followed by Tau Industries (Pty) Ltd and its contractors throughout the whole period of prospecting.

ABBREVIATIONS

AIA	Archaeological Impact Assessment
ECO	Environmental Control Officer
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EM	Environmental Manager
EMP	Environmental Management Plan
HIA	Heritage Impact Assessment
ISS	Integrated Specialist Services (Pty) Ltd
LIA	Late Iron Age
NHRA	Nation Heritage Resources Act, Act 25 of 1999
PHRA	Provincial Heritage Agency
PM	Project Manager
SAHRA	South African Heritage Resources Agency
SM	Site Manager

KEY CONCEPTS AND TERMS

Periodization Archaeologists divide the different cultural epochs according to the dominant material finds for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying. These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from South African heritage legislation and its ancillary laws, as well as international regulations and norms of best-practice. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, ecofacts and artefacts of importance associated with the history, architecture, or archaeology of human development.

Cultural significance is determined by means of aesthetic, historic, scientific, social, or spiritual values for past, present, or future generations.

Value is related to concepts such as worth, merit, attraction or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artefacts or other remains that are not in-situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless if they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example an archaeological site that has not been disturbed by farming.

Archaeological site/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artefacts, human and hominid remains, and artificial features and structures. According to the National Heritage Resources Act (NHRA) (Act No. 25 of 1999), no archaeological artefact, assemblage, or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorisation from the South African Heritage Resources Agency (SAHRA) or a provincial heritage resources authority.

Historic material are remains resulting from human activities, which are younger than 100 years, but no longer in use, including artefacts, human remains and artificial features and structures.

Chance finds means archaeological artefacts, features, structures or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where upon it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artefacts, structures, organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting, and assessing the potential positive and negative cultural, social, economic, and biophysical impacts of any proposed project, which requires authorisation of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimising or circumventing negative impacts, measures enhancing the positive aspects of the proposal and heritage management and monitoring measures.

Impact is the positive or negative effects on human well-being and / or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the prehistorical, historical or the relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area

1 INTRODUCTION

Background

Most heritage sites occur within communities, whose development should not be neglected in the name of heritage preservation but should be encouraged and embraced within legal and adaptive management frameworks (Carter and Grimwade 1997; Salafsky *et al* 2001). This case is true for the entire project area, which hosts palaeontological, archaeological, historical, natural and contemporary heritage resources. Tau Industries (Pty) Ltd is proposing to prospect with bulk sampling in respect of various Portions of the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ in the Magisterial District of Krugersdorp in Gauteng Province.

The purpose of this archaeology and Heritage Study is to assess presence/absence of heritage resources on the footprint of the proposed prospecting with bulk sampling. The study was designed to ensure that any significant archaeological or cultural physical property or sites are located and recorded, and site significance is evaluated to assess the nature and extent of expected impacts from the proposed prospecting with bulk sampling. The assessment includes recommendations to manage the expected impact of the proposed prospecting activities. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to the environmental approval process for the proposed prospecting. The report concludes with detailed recommendations on heritage management associated with the development work. Integrated Specialist Services (Pty) Ltd, an independent consulting firm, conducted the assessment; research and consultations required for the preparation of the archaeological and heritage impact report in accordance with its obligations set in the NHRA as well as the environmental management legislations.

In line with SAHRA guidelines, this report, not necessarily in that order, provides:

- 1) Management summary
- 2) Methodology
- 3) Information with reference to the desktop study
- 4) Map and relevant geodetic images and data
- 5) GPS co-ordinates
- 6) Directions to the site
- 7) Site description and interpretation of the cultural area where the project will take place
- 8) Management details, description of affected cultural environment, photographic records of the project area
- 9) Recommendations regarding the significance of the site and recommendations regarding further monitoring of the site.
- 10) Conclusion

Description of the proposed project

The project entails application for a prospecting right with bulk sampling for gold by Tau Industries (Pty) Ltd

The prospecting activities will include:

- Site preparation
- Drilling, Excavation and logging
- Hauling and transportation of ore to the processing plant
- Decommissioning and Rehabilitation

Location of the proposed development

The proposed prospecting site is located on Portions 4,6&10 of the Farm Zuikerbosfontein 151 IQ, Portion 6 & 7 of the Farm Golden Valley 621 IQ and Portion 2,27-29,33,34,36,40-44 of the Farm Koesterfontein 45 IQ, Portion 2&3 of the Farm Migalood 152 IQ, and Portion 2 of the Farm Vaalbank 512 IQ in the Mogale City Municipality of the West Rand District Municipality in, Gauteng Province. The site is located approximately 6km West of Magaliesberg and 30km North West of Krugersdorp. Rustenburg is located approximately 44km North West of the project area.

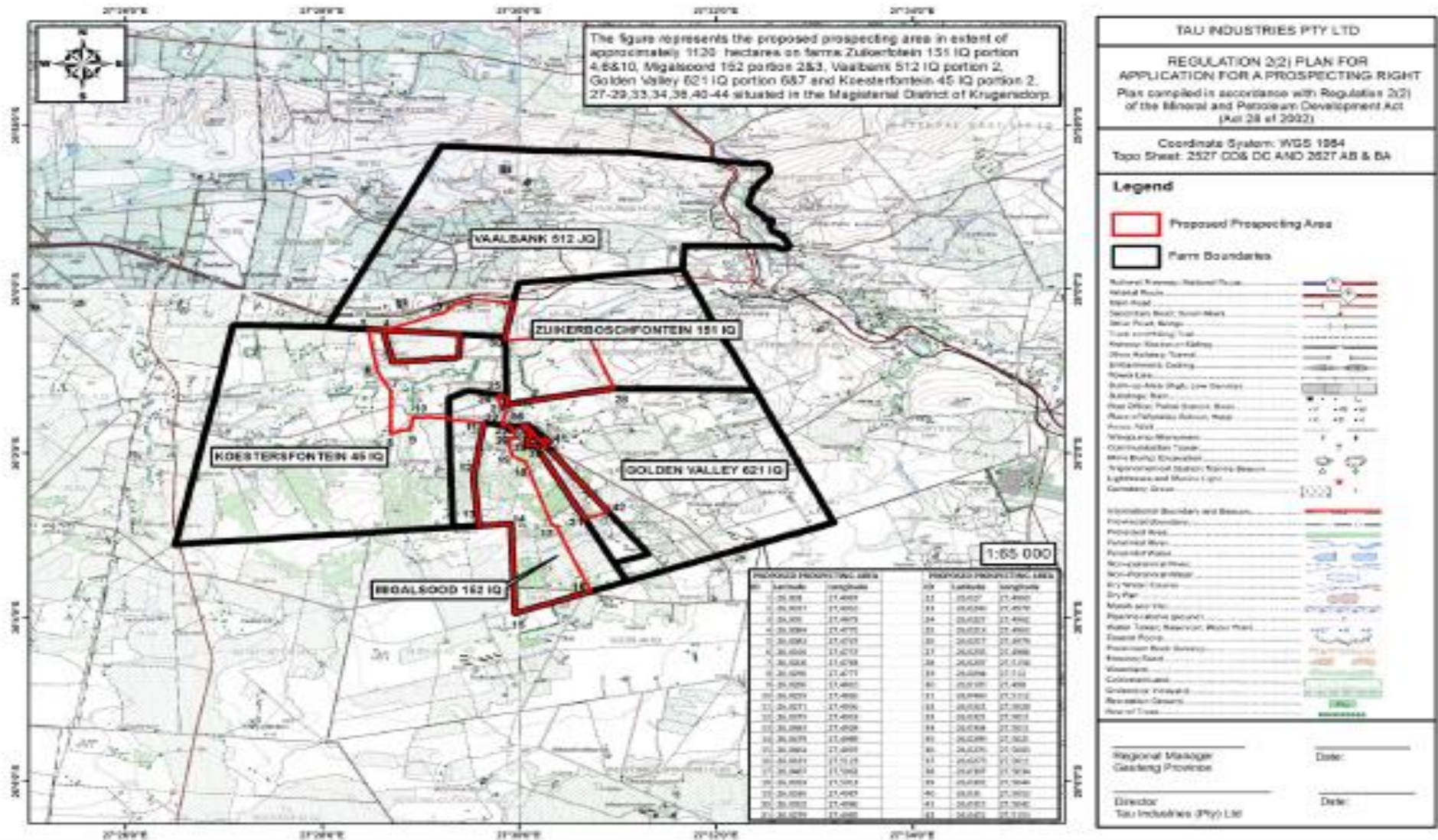


Figure 1: Proposed prospecting sites (Joan construction and Projects 2018)

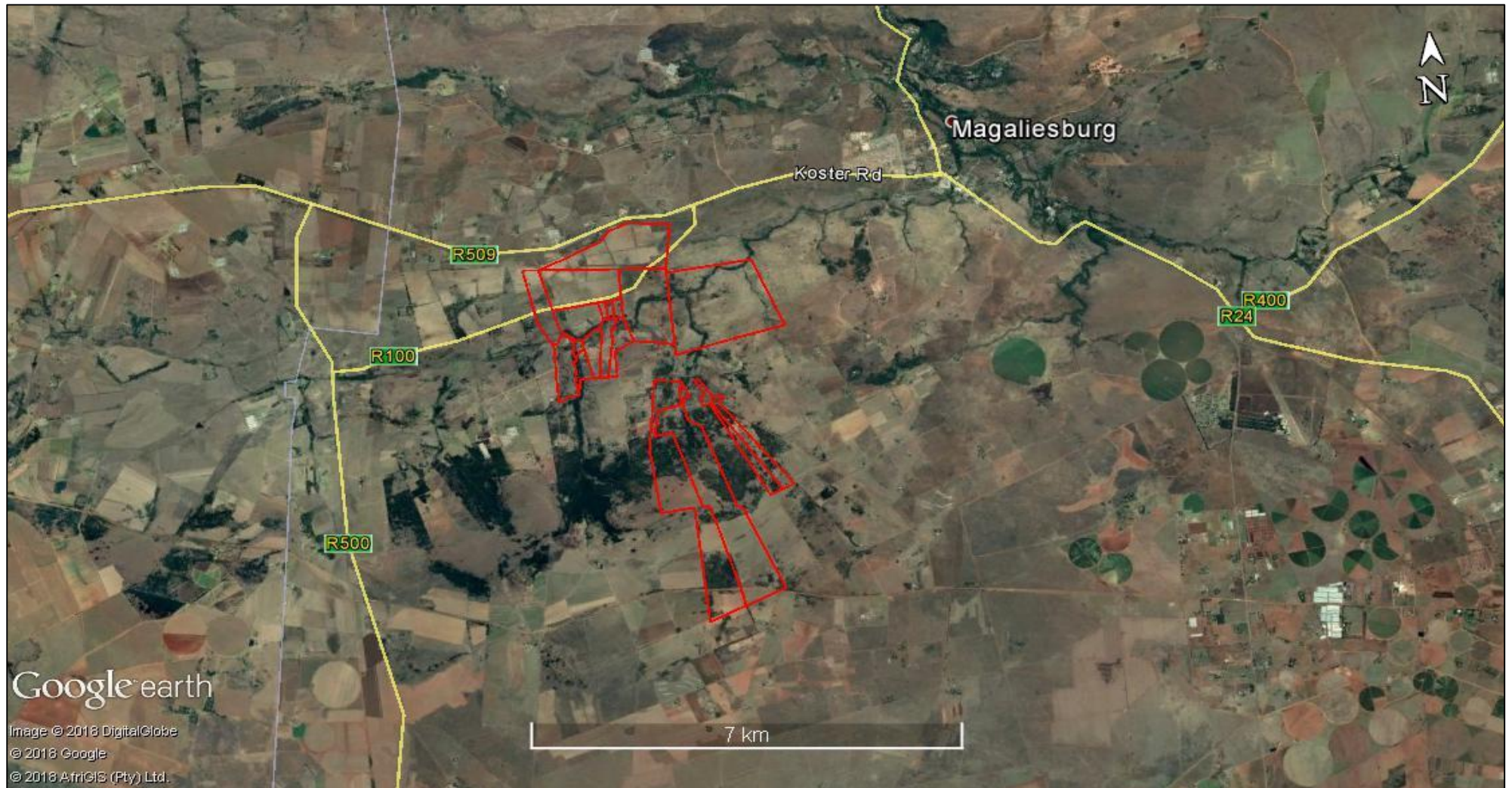


Figure 2: Proposed prospecting sites (Joan Construction and Projects 2018).

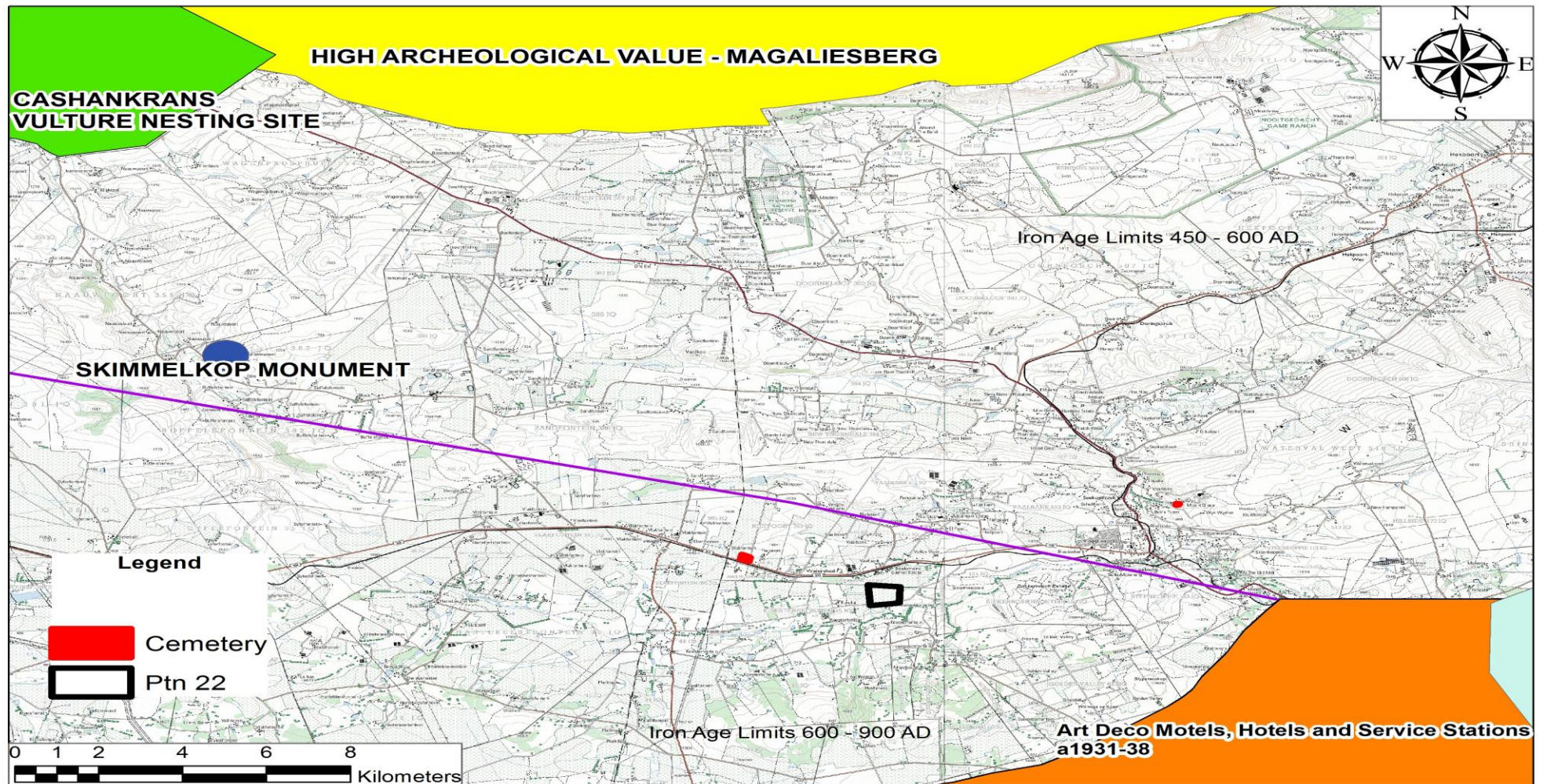


Figure 3: Heritage sensitivity map (ISS 2018).

2 LEGAL REQUIREMENTS

Relevant pieces of legislations are to the present study are presented here. Under the National Heritage Resources Act (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act 28 of 2002, and the National Environmental Management Act 107 of 1998 (NEMA) and 2014 Regulations, an AIA or HIA is required as a specialist sub-section of the EIA.

Heritage management and conservation in South Africa is governed by the NHRA and falls under the overall jurisdiction of the SAHRA and its PHRAs. There are different sections of the NHRA that are relevant to this study. The proposed development is a listed activity in terms of Section 38 of the NHRA which stipulates that the following development categories require a HIA to be conducted by an independent heritage management consultant:

- Construction of a road, wall, **powerline**, pipeline, canal or other linear form of development or barrier exceeding 300m in length
- Construction of bridge or similar structure exceeding 50m in length
- Development or other activity that will change the character of a site -
 - Exceeding 5000 sq. m
 - Involving three or more existing erven or subdivisions
 - Involving three or more erven or divisions that have been consolidated within past five years
 - Rezoning of site exceeding 10 000 sq. m
 - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority
- Any other development category, public open space, squares, parks, recreation grounds

Thus, any person undertaking any development in the above categories, 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. Section 38 (2) (a) of the NHRA also requires the submission of a heritage impact assessment report for authorization purposes to the responsible heritage resources agencies (SAHRA/PHRAs).

Related to Section 38 of the NHRA are Sections 34, 35, 36 and 37. Section 34 stipulates that no person may alter, damage, destroy, relocate etc any building or structure older than 60 years, without a permit issued by SAHRA or a provincial heritage resources authority. Section 35 (4) of the NHRA stipulates that no person may, without a permit issued by SAHRA, destroy, damage, excavate, alter or remove from its original position, or collect, any archaeological material or object. This section may apply to any significant archaeological sites that may be discovered before or during construction. This means that any chance find must be reported to SAHRA or PHRA

(the relevant PHRA), who will assist in investigating the extent and significance of the finds and inform about further actions. Such actions may entail the removal of material after documenting the find site or mapping of larger sections before destruction. Section 36 (3) of the NHRA also stipulates that no person may, without a permit issued by the SAHRA, destroy, damage, alter, exhume or 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. This section may apply in case of the discovery of chance burials, which is unlikely. The procedure for reporting chance finds also applies to the likely discovery of burials or graves by the developer or his contractors. Section 37 of the NHRA deals with public monuments and memorials which exist in the proposed project area.

In addition, the new EIA Regulations (4 December 2014) promulgated in terms of NEMA (Act 107 of 1998) determine that any environmental reports will include cultural (heritage) issues. The new regulations in terms of Chapter 5 of the NEMA provide for an assessment of development impacts on the cultural (heritage) and social environment and for Specialist Studies in this regard. The end purpose of such a report is to alert the applicant (Tau Industries), the environmental consultant, SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the prospecting, and to recommend mitigatory measures aimed at reducing the risks of any adverse impacts on these heritage resources.

Assessing the Significance of Heritage Resources

The appropriate management of cultural heritage resources is usually determined on the basis of their assessed significance as well as the likely impacts of any proposed developments. Cultural significance is defined in the Burra Charter as meaning aesthetic, historic, scientific, or social value for past, present, or future generations (Article 1.2). Social, religious, cultural, and public significance are currently identified as baseline elements of this assessment, and it is through the combination of these elements that the overall cultural heritage values of the site of interest, associated place or area are resolved.

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a place is not fixed for all time, and what is considered of significance at the time of assessment may change as similar items are located, more research is undertaken and community values change. This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time (Pearson and Sullivan 1995:7). This assessment of the Indigenous cultural heritage significance of the Site of Interest as its environments of the study area will be based on the views expressed by the traditional authority and community representatives, consulted documentary review and physical integrity.

African indigenous cultural heritage significance is not limited to items, places or landscapes associated with pre-European contact. Indigenous cultural heritage significance is understood to encompass more than ancient archaeological sites and deposits, broad landscapes, and environments. It also refers to sacred places and story sites, as well as historic sites, including mission sites, memorials, and contact sites. This can also refer to modern sites with particular resonance to the indigenous community. The site of interest considered in this project falls within this realm of broad significance.

Archaeological sites, as defined by the National Heritage Resources Act (Act 25 of 1999) are places in the landscape where people once 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 economic activities and infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. This is true for the Mogale City Local Municipality (proposed project area) whose main economic activities are mining and agriculture. It should be noted that once archaeological sites are destroyed, they cannot be replaced as site integrity and authenticity is permanently lost. Archaeological heritage contributes to our understanding of the history of the region and of our country and continent at large. By preserving links with our past, we may be able to appreciate the role past generations have played in the history of our country and the continent at large.

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 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.

Historical 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. It is important for heritage specialist input in the EIA process to take into account the heritage management structure set up by the NHR Act. It makes provision for a 3-tier system of management including the South Africa Heritage Resources Agency (SAHRA) at a national level, Provincial Heritage Resources Authorities (PHRAs) at a provincial and the local authority. The Act makes provision for two types or forms of protection of heritage resources; i.e. formally protected and generally protected sites:

Formally Protected Sites

- Grade 1 or national heritage sites, which are managed by SAHRA
- Grade 2 or provincial heritage sites, which are managed by the PHRA.
- Grade 3 or local heritage sites.

General Protection

- Human burials older than 60 years.
- Archaeological and palaeontological sites.
- Shipwrecks and associated remains older than 70 years.
- Structures older than 60 years.

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.

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, auguring), 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 reinternment [including 2a, 2b & 3]

Furthermore, the significance of archaeological sites was based on six main criteria:

- Site integrity (i.e. primary vs. secondary context),
- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter),
- Social value,
- Uniqueness, and
- Potential to answer current and future research questions.

An important 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 prospecting 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.

Table 1: Evaluation of the proposed prospecting development as guided by the criteria in NHRA, MPRDA and NEMA

ACT	Stipulation for developments	Requirement details
NHRA Section 38	Construction of road, wall, power line, pipeline, canal or other linear form of development or barrier exceeding 300m in length	No
	Construction of bridge or similar structure exceeding 50m in length	No
	Development exceeding 5000 sq. m	No
	Development involving three or more existing erven or subdivisions	No
	Development involving three or more erven or divisions that have been consolidated within past five years	No
	Rezoning of site exceeding 10 000 sq. m	No
	Any other development category, public open space, squares, parks, recreation grounds	No
NHRA Section 34	Impacts on buildings and structures older than 60 years	No
NHRA Section 35	Impacts on archaeological and paleontological heritage resources	Subject to identification during Phase 1 walk down survey
NHRA Section 36	Impacts on graves	Subject to identification during Phase 1
NHRA Section 37	Impacts on public monuments	No
Chapter 5 (21/04/2006) NEMA	HIA is required as part of an EIA	Yes
Section 39(3)(b) (iii) of the MPRDA	AIA/HIA is required as part of an EIA	Yes

Other relevant legislations

The Human Tissue Act

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. 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 Committee (MEC) as well as the relevant Local Authorities.

Terms of Reference

The author was instructed to conduct an AIA/HIA study addressing the following issues:

- Archaeological and heritage potential of the proposed prospecting sites including any known data on affected areas;
- Provide details on methods of study; potential and recommendations to guide the PHRA/ SAHRA to make an informed decision in respect of authorisation of the proposed prospecting with bulk sampling.
- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed prospecting sites;
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value;
- Describe the possible impact of the proposed prospecting on these cultural remains, according to a standard set of conventions;
- Propose suitable mitigation measures to minimize possible negative impacts on the cultural resources;
- Review applicable legislative requirements;

PHOTOGRAPHIC PRESENTATION OF THE PROJECT SITES



Plate 1: Photo 1: View of some cultivated sections of the proposed prospecting sites (Photograph © by Author 2018).



Plate 2: Photo 2: View of some sections covered by vegetation cover(Photograph © by Author 2018).



Plate 3: Photo 3: View of some areas which were burn during the survey (Photograph © by Author 2018).



Plate 4: Photo 4: View of sections which fall on rocky areas (Photograph © by Author 2018)



Plate 5: Photo 5: View of prospecting area (Photograph © by Author 2018)



Plate 6: Photo 6: View of prospecting site(Photograph © by Author 2018)



Plate 7: Photo 7: View of prospecting area (Photograph © by Author 2018). Note the blue gums on the background.



Plate 8: Photo 8: View of prospecting site (Photograph © by Author 2018)



Plate 9: Photo 9: View of prospecting site (Photograph © by Author 2018). Note that burnt areas provided high visibility of potential archaeological signatures.



Plate 10: Photo 10: View of proposed prospecting site (Photograph © by Author 2018). Note that a significant extent of the proposed prospecting site was burnt at the time of this survey.



Plate 11: Photo 11: An aerial view of the prospecting sites (Photograph © by Author 2018).



Plate 12: Photo 12: View of prospecting site seen from the east (Photograph © by Author 2018).

3 METHODOLOGY

Relevant published and unpublished sources were consulted in generating desktop information for this report. This included online databases such as the UNESCO website, Google Earth, Google Scholar and SAHRIS. Previous HIA in the project area were also consulted. A number of published works on the archaeology, history and palaeontology were also consulted. This included dedicated archaeological, paleontological and geological works by (Breutz 1956; 1968; 1987; Button 1971; Clarck 1971; Eriksson *et al.* 1975; Bertrand and Eriksson 1977; Humphreys 1978; Humphreys and Thackeray 1983; Beaumont and Vogel 1984; Beaumont and Morris 1990; Beaumont 1999; Holmgren *et al.* 1999; Johnson *et al.* 1997; Peabody 1954; Shillington 1985; Wills 1992; Young 1934; 1940, Huffman 2007, Mason 1962). Thus, the proposed prospecting with bulk sampling by Tau Industries (Pty) Ltd was considered in relation to the broader landscape, which is a key requirement of the ICOMOS Guidelines.

The proposed prospecting with bulk sampling requires clearance and authorisation from government compliance agencies including the heritage authority of SAHRA. The objectives of this report are to:

- Fulfil the legislative requirements of the National Heritage Resources Act, Act 25 of 1999.
- Identify and describe, (in terms of their conservation and / or preservation importance) sites of cultural and archaeological importance that may be affected by the proposed prospecting activities. This study searched for sites and features of traditional historical, social, scientific, cultural, and aesthetic significance within the affected study area; the identification of gravesites.
- Assess the significance of the resources where they are identified.
- Evaluate the impact thereon with respect to the socio-economic opportunities and benefits that would be derived from the proposed prospecting with bulk sampling.
- Provide guidelines for protection and management of identified heritage sites and places (including associated intangible heritage resources management that may apply).
- Consult with the affected and other interested parties, where applicable, in regard to the impact on the heritage resources in the project's receiving environment.
- Make recommendations on mitigation measures with the view to reduce specific adverse impacts and enhance specific positive impacts on the heritage resources.
- Take responsibility for communicating with the SAHRA/PHRA-G and other authorities in order to obtain the relevant permits and authorization with reference to heritage aspects.

The following tasks were undertaken:

- Preparation of a predictive model for archaeological heritage resources in the study area.

- A review and gap analysis of archaeological, historical, and cultural background information, including possible previous heritage consultant reports specific to the affected project area, the context of the study area and previous land use history as well as a site search;
- Field survey of the proposed prospecting sites in order to test the predictive model regarding that heritage sites in the area;
- Physical cultural property recording of any identified sites or cultural heritage places;
- Identification of heritage significance; and
- Preparation of AIA/HIA report with recommendation, planning constraints and opportunities associated with the proposed prospecting with bulk sampling.

Walking surveys were conducted in order to identify and document archaeological and cultural sites within the proposed prospecting sites. Formal settlements, grazing lands; village roads and main road infrastructures, cultivated cornfields, distribution & transmissions lines and other auxiliary infrastructures dominate the affected project area. The entire project area was accessible through a network of main roads (R100, R500 & R509), district roads and farm tracks used to access farmsteads. Although some sections were covered by thick vegetation cover, this did not hinder identification of possible archaeological sites in surveyed areas. Geographic coordinates were obtained with a handheld Garmin GPS global positioning unit. Photographs were taken as part of the documentation process during field study.

3.1 Assumptions and Limitations

The investigation has been influenced by the unpredictability of buried archaeological remains (absence of evidence does not mean evidence of absence) and the difficulty in establishing intangible heritage values. It should be noted that archaeological deposits (including graves and traces of archaeological heritage) usually occur below the ground level. Should artefacts or skeletal material be revealed at the site during construction, such activities should be halted immediately, and a competent heritage practitioner, SAHRA or PHRA-G must be notified in order for an investigation and evaluation of the find(s) to take place (see NHRA (Act No. 25 of 1999), Section 36 (6)). Recommendations contained in this document do not exempt the developer from complying with any national, provincial and municipal legislation or other regulatory requirements, including any protection or management or general provision in terms of the NHRA. The author assumes no responsibility for compliance with conditions that may be required by SAHRA in terms of this report

The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion or field ploughing. Some assumptions were made as part of the

study and therefore some limitations, uncertainties and gaps in information would apply. It should however, be noted that these do not invalidate the findings of this study in any significant way:

- The proposed prospecting activities will be limited to specific right of site as detailed in the development layout (Figure 1& 2).
- The prospecting team to provide link and access to the proposed site by using the existing access roads and there will be no construction beyond the demarcated site.
- No excavations or sampling were undertaken, since a permit from heritage authorities is required to disturb a heritage resource. As such the results herein discussed are based on superficially observed indicators. However, these surface observations concentrated on exposed sections such as road cuts and clear farmland.
- This study did not include any ethnographic and oral historical studies nor did it investigate the settlement history of the area.

3.2 Consultation

Public consultations are being conducted by an independent practitioner and issues raised by Interested and Affected parties will be presented during Specialist integration meetings. Issues relating to heritage will be forwarded to the heritage specialist. Integrated Specialist Services team consulted farm owners such as Joco du Toit in respect of heritage resources such as graves, historical buildings and structures located in their farms. A questionnaire was sent to each landowner to confirm if there are any heritage resources in his or her farm (see list of farmers consulted in Appendix 1)

4 CULTURE HISTORY BACKGROUND OF THE PROJECT AREA

Stone Age Archaeology

Gauteng area has yielded evidence of human settlement extending into hundreds of thousands of years of prehistory that include the Stone Age, Iron Age, Historical period and contemporary communities. The palaeontological human-evolution record is rich in palaeoanthropological relics that were found in Sterkfontein and Maropeng areas that have been dubbed the Cradle of Mankind that is also a World Heritage Site. The Cradle of Mankind lies approximately 25km north of the project area. As a complex system of dolomitic caves, this area has produced evidence for occupation dating back to at least 2.3 mya, and yielding the largest collection of fossil remains pertaining to the evolution of modern man. It is here, at sites such as Sterkfontein and Swartkrans that stone tools dating to the ESA and MSA and hominid remains such as Australopithecus, Paranthropus and Homo Habilis have been studied since the 1940's (Brodie 2008). There is evidence of the use of the larger area by Stone Age communities for example along the Kliprivier where ESA and MSA tools were recorded. LSA material is

recorded along ridges to the south of the current study area (Huffman 2008). Petroglyphs occur at Redan as well as along the Vaal River (Berg 1999). The closest known Stone Age sites in the vicinity of project area are known as the Magaliesberg Research Area. It consists of nine sites including rock shelters in the Magaliesberg Mountains. These date back to the Middle and Late Stone Age (Bergh 1999: 4; Korsman & Meyer 1999: 94-95). Rock art and rock engraving sites have also been identified close to Hekpoort. These date back to the Late Stone Age (Bergh 1999: 5). Some scattered stone tools were identified in the area during an earlier survey for Plumari (Doornhoek Portion 1), while a fairly large number of rock engravings associated with the San was also located during the same said survey in November 2008 (See Pelser & van Vollenhoven, 2008: AE 868). No similar artefacts were recorded during the 2009 survey on Doornspruit.

Iron Age sites associated with the ancestors of the modern Sotho-Tswana and Ndebele speaking communities are wide spread in the region. In recent colonial history, the area played host to different competing local settler communities. The area was a scene of series of colonial wars. By the end of the 19th century, the region was placed under British rule and the local people displaced. Today most of the land is used for commercial, mining, agricultural and industrial activities. It is within this cultural landscape that the project area is located. Archaeologically, the Gauteng (Randfontein area) is associated with Late Iron Age Sotho-Tswana communities and has yielded four ceramic sequences of the Urehwe tradition: Ntsuanatsatsi (1450-1650), Olifantspoort (AD 1500 -1700), Uitkomst (AD 1700-1850) and Buispoort (1700-1840) [Huffman 2007: 443]. This area was historically occupied by predominantly Sotho-Tswana -speaking groups before Mzilikazi's Ndebele briefly dominated during the Mfecane. Around the 1830s, the region also witnessed the massive movements associated with the Mfecane ('wandering hordes'). The causes and consequences of the Mfecane are well documented elsewhere (e.g. Hamilton 1995; Cobbing 1988). The area was partitioned into commercial settler farms during the colonial period.

Melville Koppies is the most well documented site in the project area. The site was excavated by Professor Mason from the Department of Archaeology of the Witwatersrand University in the 1980's. Extensive Stone walled sites are also recorded at Klipriviers Berg Nature reserve belonging to the Late Iron Age period. A large body of research is available on this area. These sites (Taylor's Type N, Mason's Class 2 & 5) are now collectively referred to as Klipriviersberg (Huffman 2007). These settlements are complex in that aggregated settlements are common, the outer wall sometimes includes scallops to mark back courtyards, there are more small stock kraals, and straight walls separate households in the residential zone. These sites date back to the 18th and 19th centuries and were built by people in the Fokeng cluster.

In this area, the Klipriviersberg walling probably ended around AD 1823, when Mzilikazi entered the area (Rasmussen 1978). This settlement type may have lasted longer in other areas because of the positive interaction

between Fokeng and Mzilikazi. Prior to the Gauteng region being incorporated into the colonial administration of the Transvaal, the region experienced several episodes of white settler migration and settler settlements as well as the associated colonial wars such as the Anglo-Boer War, which ended in 1902. Today the project area is predominantly mining and commercial farming.

Previous research indicates that one of the few Early Iron Age sites that have been properly researched, are situated at Broederstroom, a site to the east of the project area (Bergh 1999: 6). The site is dated to 350 AD and apart from hut remains indications of iron smelting was also found (Van der Ryst & Meyer 1999: 98). Late Iron Age sites have been identified in the area around the town of Brits. In a band stretching roughly from Brits in the east to Zeerust in the west many Iron Age sites have been discovered previously (Bergh 1999: 7-8). During the survey on Doornhoek by Archaetnos in 2008 a number of stone walled LIA sites were recorded, similar to the ones recorded during this survey. During earlier times and in the 19th century it seems as if this area was not inhabited, due to better climatic conditions in the Magaliesberg Mountain (Bergh 1999: 10-11). During the Difaqane the Ndebele of Mzilikazi moved through this area, followed by a commando of Voortrekkers in 1837 (Bergh 1999: 11).

The area around Magaliesberg also witnessed some action during the Anglo-Boer War. Blockhouses were erected by the British at Kommandonek, Pampoennek, Olifantsnek, Silkaatsnek, Broederstroom, Kalkheuwel, Nooitgedacht and Hekpoort (Van Vollenhoven & Van den Bos 1997: 107-128). There also was a skirmish at Silkaatsnek in the Magaliesberg Mountain nearby on 11 July 1900 (Bergh 1999: 51). Other skirmishes in the vicinity of project area include the Battles of Buffelspoort on 3 December 1900, Nooitgedacht on 13 December 1900 and Vlakfontein on 29 May 1901 (Bergh 1999: 54). A number of historical features were recorded during 2008 by Pelsers & van Vollenhoven on Portion 1 of Doornhoek (AE868).

Intangible Heritage

As defined in terms of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage (2003) intangible heritage includes oral traditions, knowledge and practices concerning nature, traditional craftsmanship and rituals and festive events, as well as the instruments, objects, artefacts and cultural spaces associated with group(s) of people. Thus, intangible heritage is better defined and understood by the particular group of people that uphold it. In the present study area, very little intangible heritage is anticipated on the development footprint because most historical knowledge does not suggest a relationship with the study area per se, even though several other places in the general area do have intangible heritage.

SAHRIS Database and Impact assessment reports in the proposed project area

Several heritage sites are on record in the Magaliesberg area covered by the 2627AB 1: 50 000 Sheet. These sites consist of Stone Age, Late Iron Age, Anglo Boer War remains and Historic mining remains. Several Heritage Impact Assessment studies were conducted in the general vicinity of the study area. The studies include powerline projects completed by Van Schalkwyk (2007,2015) the report mentions that structures older than 60 years occur in the area. Pelsler and Vollenhoven (2009a, 2009b) for residential developments, the study also mentions several archaeological and heritage sites in the project area. Coetzee (2009, 2010, 2012) also conducted studies for residential developments in the Magaliesberg area and did record any site of significance. Pelsler (2009) note existence of prehistoric sites, sites associated with Anglo Boer war as well as sites associated with the recent struggle against apartheid. Fourie (2006, 2011a & 2011b) study for pipeline developments also noted rich cultural history of Magaliesberg area.

5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY

The proposed prospecting sites are located within agriculture fields on the Farm Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ in the Magisterial District of Krugersdorp in Gauteng. The proposed prospecting sites have been established through consideration of biophysical, social, technical, and cultural aspects. The Environmental Impact Assessment process will aim to provide a final site assessment of the proposed prospecting sites based on biophysical, social, cultural, and technical considerations. The following section presents results of the archaeological and heritage survey conducted within the proposed mining project area.

Table 2: Summary of findings

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	Most farm houses in the project are older than 60 years and therefore protected by the NHRA
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	There are historical settlements in the prospecting area
Mining heritage	Two historic mining excavations were recorded during the survey on Portion 40 of the Farm Koesterfontein 45 IQ.
Landscapes and natural features of cultural significance	None
Archaeological and palaeontological sites	One historical archaeological site (SWHMC 1) with approximately more than 100 years old stone structures clustered on the banks of the Blaauwbank River. The study rated the site as of medium heritage significance.
Graves and burial grounds	None were recorded during the survey.
Movable objects	None
Overall comment	The survey confirmed that the majority of farm houses and structures in the project area are older than 60 years and therefore protected by section 34 of the

	NHRA. The study noted that abandoned historical houses and structures are more vulnerable than occupied historical buildings. Recorded mine shafts are still intact and have not been interfered with by illegal miners (Zama zama). However, nearby hill has been subjected to illegal mining any traces of historical mining were destroyed.
--	--

Archaeological Site

The proposed prospecting sites on the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ yielded one historical archaeological site. The site covers approximately one hectare on the western bank of the Blaauwbank River and a third of a hectare on the eastern side of the Blaauwbank River on the Farm Koesterfontein 45 IQ (see Plate 13,14,15 &16). The site is located on a mountain slope approximately 40m from the Blaauwbank River. The study recorded twenty (20) free standing stone structures of varying sizes. The height of the stone walled structures range from between 1m to 1.6m high. Although some appear like dry stone walling, there are traces of plastering on some of the structures. The structures are rectangular in shape probably an indication of European influence on the architecture. The structures are still intact although some are being destroyed by livestock and burning of trees which fall on top of standing walls. Although structures are located on a rocky area, some of them are disturbed by vegetation overgrowth. The site is attributed to most probably black mine labourers associated with the earliest gold rush in the Blaauwbank area (Fourie and Ramsden 2002). Its location on the banks of the river may suggest the site was probably used for sieving gold. No other archaeological remains were recorded at the site, it is likely that the remains might have been washed away since the site is on a sloppy and rocky area. The field survey rated the site as of medium heritage significance and further research is required to understand the history and relationship of the site to Baauwbank Gold Rush. Other than the stone structures there is very little to salvage because any other objects or cultural remains might have been washed away over the years. Although partially disturbed by lack of maintenance, the structures are in a good state of conservation.

On the other sections, the affected landscape is heavily degraded from previous and current agriculture activities, small scale mining, infrastructure developments and human settlements (See Plates 1-12). There are corn fields, residential, small scale mining, grazing land, railway line, power lines, roads, and other associated infrastructures within the entire project area. As such the proposed prospecting with bulk sampling, will be an additional on the project area (Figure 1, 2 and 3) also see Plates 1 to 7). It is assumed that the chances of recovering significant

archaeological materials were seriously compromised and limited due to agriculture activities (ploughing and harvesting using large combine harvesters).



Plate 13: Photo 13: View of the historical archaeological site seen from the west on the Farm Koesterfontein 45 IQ (Photograph © by Author 2018). Not that the other section of the site is located across the river marked by badly done river bank.



Plate 14: Photo 14: A closer view of the site seen of the western side of the river (Photograph © by Author 2018)



Plate 15: Photo 15: Closer view of some structures at the site (Photograph © by Author 2018)



Plate 16: Photo 16: View of one structure closer to the river (Photograph © by Author 2018)



Plate 17: Photo 17: View of one structure which have traces of Zama Zamas sheltering in the structure (Photograph © by Author 2018)



Plate 18: Photo18: View of one structure with vegetation overgrowth affecting some walls (Photograph © by Author 2018)



Plate 19: Photo 19: View of a structure with collapsing walls possibly as a result of livestock passing through on their way to the river (Photograph © by Author 2018)



Plate 20: Photo 20: View of isolated structure located on the top of the slope (Photograph © by Author 2018)



Plate 21: Photo 21: View of isolated structure on the top of the slope overlooking the river (Photograph © by Author 2018)



Plate 22: Photo 22: View of a structure located approximately 80m from the rest (Photograph © by Author 2018)



Plate 23: Photo 23: View of ab (Photograph © by Author 2018)



Plate 24: Photo 24: View of an isolated stone structure on the top of the slope (Photograph © by Author 2018)



Plate 25: Photo 25: View of structure with trees which are likely to destroy the walls should they be an accidental fire (Photograph © by Author 2018)

Buildings and Structures older than 60 years

The field study confirmed that the majority of farm houses and structures in the project area are older than 60 years although most of them have been renovated or altered over a long period. Most of the historic buildings and structures are still in use however some significant historic houses and structures are now abandoned and neglected. Abandoned historical houses and structures are more vulnerable than the occupied ones. Historical homesteads located on the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ were recorded and georeferenced. Note that buildings and structures older than 60 years regardless of their condition are protected by Section 34 of the NHRA. Therefore, they must not be destroyed or altered without a permit from SAHRA/PHRA-G. Abandoned homesteads are often associated with burials and it is common with black communities who burry infants within houses. It has emerged that abandoned homesteads are very significant in the light of land restitution because they provide evidence of occupation by previously evicted communities. The age and significance of potentially affected buildings and structures will be assessed in detail once the final prospecting points are established.

Table 3: Historical farm buildings and structures in the project area

Site	Coordinates	Description
HFS 1	S 26° 1' 14.7"; E 27° 26 ' . 30 7".	Abandoned farm structures which resembles a toilet
AHFH 1	S 26° 1' 18.2"; E 27° 26 ' . 30 7".	Abandoned historical farm house
AHFH2	S 26° 1' 18.2"; E 27° 26 ' . 30 7".	Abandoned historical farm house
OHFH 1	S 26° 1' 49.46"; E 27° 27 ' . 14 3".	Occupied historical Farm house
AHFH 3	S 26° 1' 28.4"; E 27° 26 ' . 29 0".	Abandoned and dilapidated farm house
AHFH4	S 26° 1' 21.24"; E 27° 26 ' . 28.9".	Abandoned historical farm house at VK11
ARSH 1	S 26° 0' 52.6"; E 27° 30 ' . 4.8".	Abandoned rectangular stone house
ARSH 2	S 26° 0' 50.31"; E 27° 30 ' . 5.6".	Abandoned rectangular stone house 2 associated with a cattle enclosure.
OHFH2	S 26° 1' 48.9"; E 27° 27 ' . 20 5".	Occupied historical farm house at VK17
AHFH5	S 26° 1' 18.1"; E 27° 26 ' . 35 6".	Abandoned farm house
OHFH 3	S 26° 1' 17.4"; E 27° 26 ' . 47. 6".	Occupied historical farm house at VK8
AHFH6	S 26° 0' 52.03"; E 27° 28 ' . 38 8".	Dilapidated historical stone house in poor state of conservation located within blue gum trees (VK5)

DHMS 1	S 26° 1' 0.4"; E 27° 29 ' . 5 5".	Old mine diggings located on Portion 40
SWHMC 1	S 26° 1' 0.4"; E 27° 29 ' . 5 5". S 26° 0' 41.2"; E 27° 30 '16. 6" S 26° 0' 42.084"; E 27° 30 '16. 3" S 26° 0' 43.9164"; E 27° 30 '15. 6"	Stone walled historical mine compound with more than 20 stone structures on both side of the Blaauwbank River. All the structures are overlooking the river on a sloppy and rocky site
RSWCK 1	S 26° 0' 46.0"; E 27° 30 ' . 12.1".	Recent stone walled cattle kraal with another attached enclosure for calves or goat/sheep.
RASMH 1	S 26° 1' 48.9"; E 27° 29 ' . 43.2".	Recent abandoned stone and mud house with cement floors. The site is located closer to a burial site where 6 traditional graves were recorded. Although the associated graves are older than 60 years, the houses look much younger than 60 years.



Plate 26: Photo 26: View of abandoned and vandalised farm house in the vicinity of Portion 11 and 22 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)



Plate 27: Photo 27: View of abandoned historical farm house along Road R100r (Photograph © by Author 2018)



Plate 28: Photo 28: View of a historical farm house in the project area (Photograph © by Author 2018)



Plate 29: Photo 29: View of a historical farm house within the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)



Plate 30: Photo 30: View of abandoned and dilapidated farmstead with several brick structures (Photograph © by Author 2018)



Plate 31: Photo 31: View of abandoned farm house and structures on the bank of the Blaauwbank River (Photograph © by Author 2018)



Plate 32: Photo 32: View of some of the standing structures at the abandoned farmstead (Photograph © by Author 2018)



Plate 33: Photo 33: View of detached huts from the main farmstead (Photograph © by Author 2018)



Plate 34: Photo 34: View of one of the occupied historical houses (Photograph © by Author 2018). Note that most historical houses in the project area have been refurbished throughout the history of their occupation.



Plate 35: Photo 35: View of a typical farmstead in the project area (Photograph © by Author 2018)



Plate 36: Photo 36: View of abandoned rectangular stone houses associated with historical miners in the project area (Photograph © by Author 2018)



Plate 37: Photo 37: View of a typical farmstead with several structures of varying ages (Photograph © by Author 2018)



Plate 38: Photo 38: View of one of the several historical stone houses clustered along the Blaauwbank River (Photograph © by Author 2018)



Plate 39: Photo 39: View of abandoned stone building (Photograph © by Author 2018). Note the precision on the walls associated with early European settlers.



Plate 40: Photo 40: View of abandoned stone walled cattle kraal (Photograph © by Author 2018)



Plate 41: Photo 41: View of recent stone and mud house with cement floors (Photograph © by Author 2018)



Plate 42: Photo 42: View of abandoned stone house with mud plaster (Photograph © by Author 2018)



Plate 43: Photo 43: View of abandoned and vandalised farm house in the vicinity of Portion 11 and 22 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)

Burial grounds and graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities for infrastructure developments such as powerlines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials.

The field survey recorded one burial site (ZBS1) located on the southern edge of the prospecting site (see Plate 44, 45 & 46). The burial site is located at GPS Coordinates S26° 1' 48.3"; E 27° 29' 46 ".2". Six traditional graves were recorded at the site. The graves are arranged in two rows. They are all facing west and marked by oval shaped stone piles. It looks like there are 3 adults and 3 children/infants graves at the site (see Plate 46). One grave has an inscribed head stone indicating that deceased was buried in 1937(see Plate 45). This automatically places the site under the jurisdiction of SAHRA. The graves are likely associated with an abandoned homestead located approximately 80m from the site. The site must be preserved *in situ* and to avoid any accidental damage during prospecting, the site must be barricaded by a danger warning tape.

The possibility of encountering previously unidentified burial sites is very low within the prospecting sites, should such sites be identified during construction, they are still protected by applicable legislations and they should be protected (also see Appendixes for more details). Burial sites older than 60 years are protected by the NHRA and those younger than 60 years are protected by the Human Tissue Act. Exhumation of graves must confirm to the standards set out in the ordinance on excavation (Ordinance no.12 of 1980 which replaced the old Transvaal Ordinance no.7 of 1925).



Plate 44: Photo 44: View of graves at burial site ZBS1 (Photograph © by Author 2018)



Plate 45: Photo 45: View of grave with inscribed headstone at ZBS1 (Photograph © by Author 2018)



Plate 46: Photo 46: View of graves at ZBS1 seen from the north (Photograph © by Author 2018)

Significance valuation for Burial Ground, Historic Cemeteries, and Individual Graves

The significance of burial grounds and gravesites is closely tied to their age and historical, cultural, and social context. Nonetheless, every burial should be considered as of high socio-cultural significance protected by practices, a series of legislations, and municipal ordinances.

Historical Monuments and Memorials

The survey did not identify any historical monument and public memorials within Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ. There are no sites within the proposed prospecting site that are on the National Heritage or provincial list. However, it should be noted that there are Historical Monuments listed on SAHRIS Data base in the Mogale City Local Municipality of Gauteng Province. The proposed development will not impact on any listed monuments and memorials in the project area.

Battle fields

Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ did not witness any clashes or battles during the Anglo Boer War.

Palaeontology

The Palaeontological sensitivity map shows that the proposed project area is located within a generally sensitive area. Limestone deposits which may contain fossilised remains of animals, plants or early hominids occur in the

project area. For example, the skeleton of the Taung child, which is related to Australopithecine family, was found in limestone deposits at Taung in the North-West Province whilst limestone deposits near Makapans Cave in Mokopane revealed remains of Homo Erectus and other extinct animal species.

Archaeo-Metallurgy, Prehistoric Mining and Mining Heritage

The study identified 2 disused mine shafts on Portion of 40 of the Farm Koesterfontein 45 IQ. Historical mine shafts are protected by the NHRA and must not be interfered with without a permit from SAHRA.



Plate 47: Photo 47: View of disused mine pit within Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)



Plate 48: Photo 48: View historical diggings within Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)



Plate 49: Photo 49: View of historical diggings for slate with Portion 40 of the Farm Koesterfontein 45 IQ (Photograph © by Author 2018)



Plate 50: Photo 50: View of historic diggings which are being re-mined illegal (Photograph © by Author 2018)

Natural Heritage

Several patches of blue gums and other exotic trees are scattered throughout the project area on the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ. It should be noted that patches of blue gums and exotic trees mark the footprint of early European settlements in the project area, they are associated with farmsteads and historical graves. As such where ever they occur they provide insights about colonial history of the area and must be avoided where possible.

Visual impacts

The proposed prospecting sites are not on the view shed of any listed heritage site.

Mitigation

Prospecting activities must avoid all historical farm houses and structures in the project area. However, should it become necessary to destroy them a permit from PHRA-G must be obtained before any work commences. The disused mine shafts are protected by the NHRA and must also be avoided. A 25m buffer zone must be provided for between heritage buildings, historic mine shafts and any prospecting points. In addition, the prospecting teams must be made aware of such heritage sites and how to deal with any potential damage to these sites Preferably an archaeologist must be retained to monitor any prospecting activities near the recorded historic shafts to avoid any

potential infringements on the site. Burial site ZBS1 must be barricaded by a danger warning tape to avoid any accidental damage during prospecting. Site SWHMC 1 must be avoided, further research is required on the site to establish its origin, significance and relationship to the first gold rush and other historical events such as the Anglo Boer War.

6 CUMMULATIVE IMPACTS

The European Union Guidelines define cumulative impacts as: "Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project. Therefore, the assessment of cumulative impacts for the proposed prospecting is considered the total impact associated with the proposed prospecting when combined with other past, present, and reasonably foreseeable future developments projects. An examination of the potential for other projects to contribute cumulatively to the impacts on heritage resources from this proposed mining project was undertaken during the preparation of this report. The total impact arising from the proposed project (under the control of the applicant), other activities (that may be under the control of others, including other developers, local communities, government) and other background pressures and trends which may be unregulated. The project's impact is therefore one part of the total cumulative impact on the environment. The analysis of a project's incremental impacts combined with the effects of other projects can often give a more accurate understanding of the likely results of the project's presence than just considering its impacts in isolation. The impacts of the proposed development were assessed by comparing the post-project situation to a pre-existing baseline. Where projects can be considered in isolation this provides a good method of assessing a project's impact. However, in this case there are several infrastructure developments including agricultural activities where baselines have already been affected, the proposed prospecting will continue to add to the impacts in the region, it was deemed appropriate to consider the cumulative effects of proposed prospecting.

This section considers the cumulative impacts that would result from the combination of the proposed prospecting with bulk sampling. There are existing infrastructure developments and agriculture activities within the proposed prospecting sites. As such increased development in the project area will have a number of cumulative impacts on heritage resource whether known or covered in the ground. For example, during prospecting phase they will be increase in human activity and movement of heavy prospecting equipment and vehicles that could change, alter or destroy heritage resources within and outside the prospecting sites given that archaeological remains occur on the surface. Cumulative impacts that could result from a combination of the proposed prospecting with bulk sampling and other actual or proposed future developments in the broader study area include site clearance and the removal of topsoil could result in damage to or the destruction of heritage resources that have not previously been recorded for example abandoned and unmarked graves.

Heritage resources such as burial grounds and graves and archaeological as well as historical sites are common occurrences within the greater study area. These sites are often not visible and as a result, can be easily affected or lost. In addition, increased human activity during prospecting phase allows increased access to nearby heritage resources such as Burial site ZBS1 and significant stone structures SWHMC 1. Furthermore, many heritage resource in the greater study area are informal, unmarked and may not be visible, particularly during the wet season when grass cover is dense. As such, prospecting workers may not see these resources, which results in increased risk of resource damage and/or loss. Vibrations and earth moving activities associated with drilling and excavation tower have the potential to crack/damage rock art covered surfaces, which are known to occur in the greater study area. In addition, vibration from traffic has the potential to impact buildings and features of architectural and cultural significance. A potential interaction between archaeology, architectural and cultural heritage and landscape and visual during both the construction and operational phase of the proposed project is identified. Prospecting with bulk sampling will result in a visual impact and impact on features of architectural and cultural significance. Construction works associated with the provision of material assets such as gravel, in particular underground works have the potential to interact with archaeology, architectural and cultural heritage.

No specific paleontological resources were found in the project area during the time of this study; however, this does not preclude the fact that paleontological resources may exist within the greater study area. As such, the proposed mining project has the potential to impact on possible paleontological resources in the area. sites of archaeological, paleontological, or architectural significance were not specifically identified and cumulative effects are not applicable. the nature and severity of the possible cumulative effects may differ from site to site depending on the characteristics of the sites and variables.

Cumulative impacts refer to additional impacts, which even if acceptable if considered in isolation, would together with the existing impacts, exceed the threshold of acceptability and cause harm to the cultural landscape. Cumulative impacts that need attention are related to the impacts of access roads and impacts to buried heritage resources. Allowing the impact of the proposed prospecting to go beyond the surveyed area would result in a significant negative cumulative impact on sites outside the surveyed area. A significant cumulative impact that needs attention is related to stamping by especially prospecting vehicles during clearance and excavation within the prospecting sites. Movement of heavy construction vehicles must be monitored to ensure they do not drive beyond the approved sites. No significant cumulative impacts, over and above those already considered in the impact assessment, are foreseen at this stage of the assessment process. Cumulative impacts can be significant, if prospecting vehicles are not monitored to avoid driving through undetected heritage resources.

7 ASSESSMENT OF SIGNIFICANCE

Assessment Criteria

An impact can be defined as any change in the physical-chemical, biological, cultural and/or socio-economic environmental system that can be attributed to human activities related to alternatives under study for meeting a project need. The significance of the aspects/impacts of the process will be rated by using a matrix derived from Plomp (2004) and adapted to some extent to fit this process. These matrixes use the consequence and the likelihood of the different aspects and associated impacts to determine the significance of the impacts.

The significance of the impacts will be determined through a synthesis of the criteria below:

Probability: This describes the likelihood of the impact actually occurring

Improbable: The possibility of the impact occurring is very low, due to the circumstances, design or experience.

Probable: There is a probability that the impact will occur to the extent that provision must be made therefore.

Highly Probable: It is most likely that the impact will occur at some stage of the development.

Definite: The impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

Duration: The lifetime of the impact

Short Term: The impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.

Medium Term: The impact will last up to the end of the phases, where after it will be negated.

Long Term: The impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.

Permanent: The impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: The physical and spatial size of the impact

Local: The impacted area extends only as far as the activity, e.g. footprint

Site: The impact could affect the whole, or a measurable portion of the above mentioned properties.

Regional: The impact could affect the area including the neighboring residential areas.

Magnitude/ Severity: Does the impact destroy the environment, or alter its function

Low: The impact alters the affected environment in such a way that natural processes are not affected.

Medium: The affected environment is altered, but functions and processes continue in a modified way.

High: Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This 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.

Negligible: The impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.

Low: The impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.

Moderate: The impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.

High: The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The following weights were assigned to each attribute:

Aspect	Description	Weight
Probability	Improbable	1
	Probable	2
	Highly Probable	4
	Definite	5
Duration	Short term	1
	Medium term	3
	Long term	4
	Permanent	5
Scale	Local	1
	Site	2
	Regional	3
Magnitude/Severity	Low	2
	Medium	6
	High	8
Significance	Sum (Duration, Scale, Magnitude) x Probability	
	Negligible	≤20
	Low	>20 ≤40
	Moderate	>40 ≤60
	High	>60

The significance of each activity should be rated without mitigation measures (WOM) and with mitigation (WM) measures for both construction, operational and closure phases of the proposed development.

Impact Assessment Matrix

Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ.						
Nature of Impact	Management Measures	Duration	Scale	Severity	Probability	Significance
Archaeological Remains	Without management	3	3	6	2	Moderate
	With management	3	2	2	2	Low
Graves and Burial Grounds	Without management	3	3	1	4	Moderate
	With management	3	3	1	2	Low
Historical buildings and structures	Without management	3	3	6	3	Moderate
	With management	3	3	2	2	Low
Mining Heritage	Without management	3	3	1	4	Low
	With management	3	2	1	2	Low
Monuments and memorials	Without management	3	3	1	1	Moderate
	With management	1	3	1	1	Low
Natural Heritage	Without management	3	3	2		

Based on the results of the Impact Assessment Matrix the prospecting sites are all viable from a heritage perspective.

8 STATEMENT OF SIGNIFICANCE

Aesthetic Value

The aesthetic values of the AIA Study Area and the overall project area are contained in the valley bushveld environment and landscape typical of this part of the Gauteng Province. The visual and physical relationship between AIA study area and the surrounding historical Cultural Landscape demonstrates the connection of place to the local and oral historical stories of the African communities who populated this region going back into prehistory.

The proposed prospecting will be situated within an environment and associated cultural landscape, which, although developed by existing settlements, remains representative of the original historical environment and cultural landscape of this part of Gauteng Province. The local communities consider the project area a cultural landscape linked to their ancestors and history. However, the proposed development will not alter this aesthetic value in any radical way since it will add to the constantly changing and developing settlements.

Historic Value

The Indigenous historic values of the Site of Interest and overall study area are contained in the claim of possible historic homesteads being located on the affected area. The history of generations of the Sotho-Tswana clans is tied to this geographical region. Such history goes back to the pre-colonial period, through the colonial era, the colonial wars and subsequent colonial rule up to modern day Gauteng Province.

Scientific value

Past settlements and associated roads and other auxiliary infrastructure developments and disturbance within the HIA Study Area associated with the proposed prospecting has resulted in limited intact landscape with the potential to retain intact large scale or highly significant open archaeological site deposits.

Social Value

The project sites fall within a larger and an extensive Gauteng cultural landscape that is integrated with the wider inland. The overall area has social value for the local community, as is the case with any populated landscape. Literature review suggests that social value of the overall project area is also demonstrated through local history which associates the area with the coming of European missionaries, explorers and colonialists and the African struggle against settler colonialism in the second half of the 1800s and at the end of the 1800s, the colonial wars of resistance, the century long struggle for democracy that followed colonial subjugation. Several generations of communities originate from the project area and continue to call it home. As such, they have ancestral ties to the

area. The land also provides the canvas upon which daily socio-cultural activities are painted. All these factors put together confirms the social significance of the project area. However, this social significance is unlikely to be negatively impacted by the proposed prospecting especially given the fact that the development will add value to the human settlements and activities already taking place. Some sections of the farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ are covered by thick bushes and vegetation retains social value as sources of important herbs and traditional medicines. As such, they must be considered as significant social value sites

9 DISCUSSION

Several Phase 1 Archaeological and Heritage Impact studies were conducted in the project area since 2002. The studies were conducted for various infrastructure developments such as powerlines and substations, water supply pipelines and residential developments. These studies noted that Mogale City area is a rich cultural landscape with heritage sites dotted in the entire area. Although now altered significantly by mainly agriculture activities, several significant archaeological sites were recorded in the area and there are several colonial and post-apartheid monuments in the area for example Pelsler (2009), Coetzee (2009, 2013), Fourie and Ramsden (2002), Fourie (2006, 2009, 2011) and Van der Schalkwyk (2015). Therefore, the current study should be read in conjunction with previous Phase 1 Impact Studies conducted in the proposed project area. The lack of any other confirmable archaeological sites recorded during the current survey is thought to be a result of two primary interrelated factors:

1. That proposed prospecting site is located within a degraded area (agriculture), and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical, or burial sites, due to previous disturbances resulting from developments and other land uses in the project area.
2. Limited ground surface visibility on some sections of the project area that were not cleared at the time of the study may have impeded the detection of other physical cultural heritage site remains or archaeological signatures immediately associated with the prospecting sites. This factor is exacerbated by the fact that the study was limited to general survey without necessarily conducting any detailed inspection of specific locations that will be affected by the proposed prospecting.

The absence of confirmable and significant archaeological cultural heritage site is not evidence in itself that such sites did not exist in the general project area. It should be noted that significance of the sites of Interest (prospecting sites) is not limited to presence or absence of physical archaeological sites.

Chance finds procedures

It has already been highlighted that sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The following monitoring and reporting procedures must be followed in the event of a chance find, in order to ensure compliance with heritage laws and policies for best-practice. This procedure applies to the applicant's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. Accordingly, all construction teams must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

- ❖ If during the prospecting, operations or closure phases of this mining project, any person employed by the applicant, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the site manager.
- ❖ The site manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing ISS.
- ❖ The client will then contact a professional archaeologist for an assessment of the finds who will in turn inform SAHRA/PHRA-G.

10 RECOMMENDATIONS

The study did not find any permanent barriers to the proposed prospecting with bulk sampling various Portions Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ. It is the considered opinion of the author that the proposed prospecting with bulk sampling may proceed from a heritage resources management perspective, provided that mitigation measures are implemented if and when required. The following recommendations are based on the results of the AIA/HIA research, cultural heritage background review, site inspection and assessment of significance.

- From a heritage point of view, the proposed project is viable because the proposed project site has been extensively altered by agriculture activities and other associated infrastructure developments.
- The proposed development may be approved to proceed as planned under observation that prospecting work does not extend beyond the surveyed site.
- Site SWHMC 1 must be preserved *in situ*, no prospecting must be done with 80m from the stone walled structures.
- Should it become necessary to prospect within close range of the site, a Phase 2 Heritage study must be conducted before any prospecting activities commence on the site.
- The applicant must maintain a 25m buffer zone from the recorded burial site ZBS1.
- No dumping of construction material is allowed within this buffer zone and no alteration or damage on the site may occur.
- The recorded burial site must be demarcated by a danger warning sign and must be clearly marked to avoid any accidental damage by especially heavy prospecting machinery.
- The applicant must ensure that the descendants of the recorded graves are sought, and notified about this proposed prospecting which might have an impact (directly or indirectly) on their burial site.

- No stone robbing, or removal of any material is allowed. Any disturbance or alteration on this burial site would be illegal and punishable by law, under section 36 (3) of the National Heritage Resources Act NHRA of 1999 (Act 25 of 1999).
- Should any unmarked burials be exposed during prospecting, potential custodians must be trekked, consulted and relevant rescue/ relocation permits must be obtained from SAHRA and or Department of Health before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999.
- Should chance archaeological materials or human burial remains be exposed during subsurface construction work on any section of the proposed development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations.
- Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no other significant cultural heritage resources barriers to the proposed development. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made.
- If during the prospecting, operations or closure phases of this project, any person employed by the applicant, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance, work must cease at the site of the find and this person must report this find to their immediate supervisor, and through their supervisor to the site manager.
- The site Manager must then make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area before informing ISS.
- In the event that archaeological materials are unearthed, all prospecting within a radius of at least 20m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist should be contacted immediately
- It is the responsibility of the applicant to protect the site from publicity (i.e., media) until a mutual agreement is reached.
- Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA/PHRA-G.

- The applicant is reminded that unavailability of archaeological materials (e.g., pottery, stone tools, remnants of stone-walling, graves, etc) and fossils does not mean they do not occur, archaeological material might be hidden underground, and as such the client is reminded to take precautions during prospecting.
- The foot print impact of the proposed prospecting with bulk sampling should be kept to minimal to limit the possibility of encountering chance finds within prospecting sites.
- Overall, impacts to heritage resources are not considered to be significant for the project receiving environment. It is thus concluded that the project may be cleared to proceed as planned subject to the Heritage Authority ensuring that detailed heritage monitoring procedures are included in the project EMP for the prospecting phase, include chance archaeological finds mitigation procedure in the project EMP (See Appendix 1).
- The chance finds process will be implemented when necessary especially when archaeological materials and burials are encountered during subsurface construction activities.
- The findings of this report, with approval of the PHRA-G/SAHRA, may be classified as accessible to any interested and affected parties within the limits of the laws.

11 CONCLUDING REMARKS

The literature review and field research confirmed that the project area is situated within a contemporary cultural landscape dotted with settlements with long local history. Field survey established that the Farms Zuikerbosfontein 151 IQ, Vaalbank 512 IQ, Migalsood 152 IQ, Golden Valley 621 IQ and Koesterfontein 45 IQ earmarked for prospecting with bulk sampling are degraded by previous and current agriculture activities. In terms of the archaeology and heritage in respect of the proposed prospecting sites, there are no obvious 'Fatal Flaws' or 'No-Go' areas except on the one hectare covered by site SWHMC 1. The site must be avoided completely, however should it become necessary to prospect in the close proximity of the site, a Phase 2 Heritage study must be conducted before any work commences on the site. The recorded historical farm buildings, historical mine shafts can be avoided without compromising the planned prospecting activities. The potential for chance finds, still remains and the applicant and contractors are advised to be diligent and observant during prospecting, should prospecting activities commence on the sites. The procedure for reporting chance finds has clearly been laid out. This report concludes that the proposed prospecting with bulk sampling may be approved by SAHRA/PHRA-G to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the construction EMP (also see Appendices). The mitigation measures are informed by the results of the AIA/HIA study and principles of heritage management enshrined in the NHRA, Act 25 of 1999.

12 BIBLIOGRAPHY

- Australia ICOMOS (1999) The Burra Charter: The Australia ICOMOS charter for places of cultural significance. Burwood.
- Bergh, J.S., (ed.) Geskiedenisatlas van SuidAfrika. Die vier noordelike provinsies. Pretoria: J. L. van Schaik Uitgewers. 1999.
- Bickford, A. and Sullivan, S. 1977. "Assessing the research significance of historic sites" in S Sullivan and S Bowdler (eds) Site Surveys and Significance assessment in Australian Archaeology. Canberra: ANU.
- Birkholtz, P. 2010. Phase 1 Heritage Impact Assessment for the Proposed development of a new sedimentation and flocculation pumping station, Vereeniging, Gauteng Province
- Birkholtz, P. 2013. Phase 1 Heritage Impact Assessment for the Proposed Jameson Field Extension 1 Residential Township Development, Gauteng Province
- Brodie, N. 2008. The Origins of Man. In Brodie, N. (Ed) *The Joburg Book: A guide to the city's history, people and places*. Pan Macmillan South Africa, Johannesburg
- Burke, H. and Smith, C. 2004. The archaeologist's field handbook. Australia. Allen and Unwin.
- Coetzee, F. P. 2009. Cultural Heritage Survey of a portion of the farm Vischgat 467 IR, Sedibeng District Municipality, Midvaal Local Municipality, Gauteng.
- Coetzee, F. P. 2010. Cultural Heritage Survey of the proposed human settlements project on Portion 265 of the farm Hekpoort 504 JQ, Mogale City Local Municipality, Gauteng Province
- Coetzee, F. P. 2012. Cultural Heritage Survey of the proposed residential development on Portion 1 of the farm Vogelzang 429 JQ, Hekpoort, Gauteng Province
- Coetzee, F. P. 2013. Cultural Heritage Survey of the farm Panfontein 437 R, Vereeniging, Emfuleni Local Municipality, Gauteng Province
- Coetzee, F. P. 2016. Cultural Heritage Assessment the proposed Westonaria Pump Station and pipeline, Westonaria Local Municipality, West Rand District Municipality, Gauteng Province.
- Cooper, M. A; Firth, A., Carman, J. & Wheatley, D. (eds.)1995: Managing Archaeology. London: Routledge.
- Deacon, H. J. and Deacon J. 1999. Human beginnings in South Africa. Cape Town: David Philips Publishers.
- Dreyer, J. 1995. Late Iron Age in the Magaliesberg valley: Jones' (1935) stone structures revisited. Southern African Field Archaeology 4(1):50-57.
- Fourie, W., and van der Walt, J. 2005. Harmony Gold / Simmer & Jack 4 Shaft – Waterpan 292IQ Heritage Assessment. Unpublished report.
- Fourie, W. 2006. Heritage Impact Assessment for Maloney's Eye 1691 JQ and Steenkoppie 153 IQ, Mogale City, Gauteng.

Fourie, W. 2011a. GL21009-RW-B19-B19 pipeline Lethabo Pump station in the Free State Province to Vereeniging Pump Station in the Gauteng Province.

Fourie, W. 2011b. GL21009-RW-VG Residue line-Vereeniging to connection to Randfontein Treatment works, Heritage Impact Assessment.

Glazewski, J., 2000: Environmental Law in South Africa. Durban: Butterworths.

Hammond-Tooke, D.1993. The roots of Black South African. Johannesburg: WUP.

Huffman, T.N., Hall, S.L. & Steel, R.H. 1991. Archaeological Survey of the Rietfontein Housing Scheme, Southern Transvaal. Unpublished report

Huffman, T.N., Kruger, G., Steel, R., & Hall, S.L. 1991. PWV-18 Archaeological Impact Report. Unpublished report

Huffman, T.N. 2007. Handbook for the Iron Age. Pietermaritzburg: UKZN Press.

Huffman, T. N. 2007. Southern Africa. University of KwaZulu-Natal Press, Scottsville. Luipaardsvlei Archaeological Assessment, Randfontein. Unpublished report.

Huffman, T.N. 2008 Lenasia South Impact Assessment, Gauteng National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)

Hamilton, C. (ed.). 1995. The Mfecane Aftermath: Reconstructive debates in Southern African History. Johannesburg: WUP.

[Http://www.joburg.org.za/index](http://www.joburg.org.za/index).accessed June 2017

<https://www.sibanyegold.co.za/operations/kloof/history> (Accessed: June 2017)

<http://www.westonaria.gov.za/about-us/history-of-council/> (Accessed: June 2017)

James, H. 2000. The engravings of several portions of the farm Doornkloof 393JQ along the Magaliesberg Range. Unpublished MA thesis. Pretoria: University of Pretoria

Kruger, N. 2011 Ceramic Industries (Pty) Ltd: Syferfontein 293 IQ. Phase 1 Archaeological Impact Assessment in Westonaria, Gauteng Province

Küsel, U.S. 2007. GIS Database for Historical and Cultural Heritage Sites in the Bojanala District Municipal area of North West Province.

Kusel, U.S 2014. First Phase Heritage impact assessment for the proposed decommissioning of historic industrial machinery inside Engine room no.1 and Boiler House no.1 and 2 as well as the alteration the roof of Boiler House no.1 and the demolition of Boiler House 2 on the Vereeniging property of Rand Water, Gauteng.

Maggs, T.M., Ward, V. 1984b. Early Iron Age sites in the Muden area of Natal. *Annals of the Natal Museum* 26: 105-140.

Magoma, M. 2015. A Phase 1 Archaeological Impact Assessment Specialist Study Report for the proposed construction of the new Eskom 132kv/11/66kv calcined products and associated 2x 132kv loop in loop out servitude in Westonaria Local Municipality, West Rand District Municipality, Gauteng Province

Major Jackson, H. M. 1904. Potchefstroom. Drawn in the Surveyor-Generals Office and photo- lithographed at the Government Printing Works, Pretoria. Pretoria: Government Printing Works.

Mason, R.J. 1962. Prehistory of the Transvaal. Johannesburg. Witwatersrand University Press.

Mason, R.J. 1986. The origins of black people of Johannesburg and the southern western central Transvaal, AD350 – 1880. Johannesburg. University of the Witwatersrand Archaeological Research Unit, Occasional Paper 16.

Mlilo, T. 2017a. Phase 1 Heritage Impact Assessment Report for Proposed development of two filling stations and associated infrastructure in Mogale City Local Municipality Gauteng Province.

Mlilo, T. 2017b. Phase 1 Heritage Impact Assessment Report for Proposed development of poultry farm at Magalies 2 in Mogale City Local Municipality Gauteng Province.

Mlilo, T. 2018. A Phase 1 Heritage Impact Assessment for Proposed Establishment of a Housing Development on Portion 99 at the Corner of Commissioner and Munsie Road, Krugersdorp within the Mogale City Municipality, Gauteng

Pelser, A.J. & Van Vollenhoven, A.C. 2008. A Report on a Heritage Impact Assessment for a proposed development on the remaining extent of Portion 1 of the Doornhoek 329 JQ and Plumari Ranch 595 JQ, Hekpoort, Gauteng. Unpublished Report Archaetnos cc AE868.

Pelser, A.J. & Van Vollenhoven, A.C. 2009. A Report on a Heritage Impact Assessment for the proposed development of Worker's and Tourist Township on a portion of the farm Doornspruit 507 JQ, Hekpoort, Gauteng. Unpublished Report Archaetnos cc AE949. Pelser,

A.J. & Van Vollenhoven, A.C. 2009. A Report on a Heritage Impact Assessment for the proposed development of an Equestrian Estate on a portion of the farm Doornspruit 507 JQ, Hekpoort, Gauteng. Unpublished Report Archaetnos cc AE950.

Pelser, A.J. & A.C. van Vollenhoven. 2009. A Report on a Heritage Impact Assessment study for the Power Line

from Glockner-Kookfontein Substations Vereeniging, Gauteng. Unpublished Report Archaeonosc cc AE902. For BAAGI Environmental Consultants.

Pelser, A.J. 2011. A Report on Heritage walkdown study for the proposed new 275kv powerline between the Glockner Kookfontein Substation, Vereeniging.

Pepler-Harcombe, A.M. 2010. The Context, Classification, and Analysis of an Archaeological Surface Collection from the Farm Spokie 428 JQ, Hekpoort, Situated in the Magalies Rivier Valley, Gauteng. Unpublished Honours Project. Pretoria: University of South Africa.

Pistorius, J.C.C. 2008. A Phase 1 Heritage Impact Assessment Study for the proposed widening of Bridge 483 along the Vischgat Road near Vereeniging in the Gauteng Province, RSA.

Pistorius, J. 2009a. A Phase 1 Heritage Impact Assessment Study for the Rand Uranium Mill Site Interim Disposal Option near Randfontein in the Gauteng Province of South Africa. Unpublished report

Pistorius, J. 2009b. A Phase 1 Heritage Impact Assessment Study for Rand Uraniums Permit 3A Pit Deposition Project near Randfontein in the Gauteng Province of South Africa. Unpublished report

Pistorius, J. 2009c. A Phase 1 Heritage Impact Assessment Study for Rand Uraniums Proposed Pyrite Project near the Cook Gold Plant in Randfontein in the Gauteng Province of South Africa. Unpublished report

Piesanie, J. 2012 A Phase 1 Heritage Impact Assessment for the proposed Geluksdal Tailings Storage Facility and pipeline infrastructure for Gold One International Limited

Rasmussen, R.K. 1978 Migrant kingdom: Mzilikaqzi"s Ndebele in South Africa. London: Rex Collings

Richardson, P. 1976. Studies Coolies and Randlords: The North Randfontein Chinese Miners' Strike' of 1905. Journal of Southern African Studies, Vol. 2, No. 2 (Apr., 1976), pp. 151-177. Published. Taylor & Francis.

Ross, R. 1999 A concise history of South Africa. Cambridge University Press. Cambridge.

South Africa, 1983. Human Tissue Act. Government Gazette.

South Africa 1999. National Heritage Resources Act (No 25 of 1999), Government Gazette. Cape Town.

SAHRA APMHOB. 2004. Policy for the management of Archaeology, Palaeontology, Meteorites and Heritage Object. SAHRA: Cape Town.

SAHRA APM. 2006. Guidelines: Minimum standards for the archaeological and palaeontological Component of Impact Assessment Reports. SAHRA: Cape Town.

SAHRA APMHOB 2002. General Introduction to surveys, impact assessments and management plans. SAHRA: CT.

SAHRA. 2002. General guidelines to Archaeological Permitting Policy. SAHRA: Cape Town.

SAHRA. 2002. General Introduction to surveys, impact assessments and management plans.

SAHRA. What to do when Graves are uncovered accidentally.

SAHRA Report Mapping Project Version 1.0, 2009

SAHRIS (Cited 16 February 2016)

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

Van Schalkwyk, J.A. 2007. Heritage survey report for the proposed development in the Three Rivers Area of Vereeniging, Gauteng Province. Unpublished report 2007JvS045.

Van Schalkwyk, J.A. 2008. Heritage impact survey report for the proposed development on Zoekfontein 468IR, Vereeniging magisterial district, Gauteng Province. Unpublished report 2008JvS069.

Van Schalkwyk, J. 2009. Development of Water Pipe Lines for the Droogeheuwel and Middelvlei Townships, Randfontein Gauteng Province. Unpublished report

Van Schalkwyk, J. 2009. Heritage Impact assessment for the Ridgeview Township Development, Randfontein Local Municipality, Gauteng Province. Unpublished report

Van Schalkwyk, J.A. 2011. Heritage impact assessment for the proposed expansion of the Sebokeng Waste Water Treatment Works, Sedibeng district municipality, Gauteng Province. Unpublished report 2011JvS067.

Van Schalkwyk, J.A. 2013. Heritage impact assessment for the proposed construction of Eskom five 88kv powerline connecting Kookfontein and Jaguar Substation, Midvaal and Emfuleni Municipalities, Gauteng Province.

Van Schalkwyk, J.A. 2015. Cultural Heritage Impact Assessment for the proposed expansion of a chicken farm on Portion 75 of the Farm Doornkloof 393 JQ Hekpoort Mogale City Gauteng Province.

Van Vuuren, C.J. & Van Schalkwyk, J.A. 2005. Survey report of sites of cultural significance in the Mogale City

municipal area, Gauteng. Unpublished report 2005/01. Pretoria.

Van Schalkwyk, J.A. 2010. Heritage scoping report of Portion 45 of the farm Blaauwbank 505JQ, Mogale City magisterial district, Gauteng Province. Pretoria: Unpublished report 2010/JvS/061.

Wilson, M. 1969. Changes in social structure in southern Africa: the relevance of kinship studies to the historian. In: L. Thompson, ed., African societies in southern Africa. London: Heinemann, pp. 71–85.

Appendix 1: List of farmers consulted during the survey.

Farmer	Contact details	Farm Name	Route	Heritage
H H Mienie		Portion 12 of the Farm Kaalfontein 44 IQ		
Mr Jan Van der Burg Hnnie J Van Rensburg		Portion 37 of the Farm Kaalfontein 44 IQ		

Appendix 2: Heritage Management Plan Input into the mining development project EMP

Objective	<ul style="list-style-type: none"> Protection of archaeological sites and land considered to be of cultural value; Protection of known physical cultural property sites against vandalism, destruction and theft; and The preservation and appropriate management of new archaeological finds should these be discovered during construction. 							
No.	Activity	Mitigation Measures	Duration	Frequency	Responsibility	Accountable	Contacted	Informed
Pre-Prospecting Phase								
1	Planning	Ensure all known sites of cultural, archaeological, and historical significance are demarcated on the site layout plan, and marked as no-go areas.	Throughout Project	Weekly Inspection	Contractor [C] CECO	SM	ECO	EA EM PM
Prospecting Phase								
1	Emergency Response	Should any archaeological or physical cultural property heritage resources be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped until heritage authority has cleared the development to continue.	N/A	Throughout	C CECO	SM	ECO	EA EM PM
		Should any archaeological, cultural property heritage resources be exposed during excavation or be found on development site, a registered heritage specialist or PHRA official must be called to site for inspection.		Throughout	C CECO	SM	ECO	EA EM PM
		Under no circumstances may any archaeological, historical or any physical cultural property heritage material be destroyed or removed from site;		Throughout	C CECO	SM	ECO	EA EM PM
		Should remains and/or artefacts be discovered on the development site during earthworks, all work will cease in the area affected and the Contractor will immediately inform the Construction Manager who in turn will inform PHRA.		When necessary	C CECO	SM	ECO	EA EM PM
		Should any remains be found on site that is potentially human remains, the PHRA and South African Police Service should be contacted.		When necessary	C CECO	SM	ECO	EA EM PM
Rehabilitation Phase								
		Same as prospecting phase.						
Prospecting Phase								
		Same as prospecting phase.						

Appendix 3: Heritage mitigation measures table

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Archaeological and Burial Sites	General area where the proposed project is situated is a historic landscape, which may yield archaeological, cultural property, remains. There are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	<p>Possible damage to previously unidentified archaeological and burial sites during construction phase.</p> <ul style="list-style-type: none"> • Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to construction work • Loss of sense of place <p>Loss of intangible heritage value due to change in land use</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in construction scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate.</p> <ul style="list-style-type: none"> • Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as no-go zone by use of fencing during construction, and access thereto by the construction team must be denied. • Accidentally discovered burials in development context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority. The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction work. 	<ul style="list-style-type: none"> • Contractor / • Project Manager • Archaeologist • Project EO 	Fine and or imprisonment under the PHRA-G Act & NHRA	<p>Monitoring measures should be issued as instruction within the project EMP.</p> <p>PM/EO/Archaeologists Monitor construction work on sites where such development projects commences within the farm.</p>

Appendix 4: Legal background in South Africa

Extracts relevant to this report from the National Heritage Resources Act No. 25 of 1999, (Sections 5, 36 and 47):

General principles for heritage resources management

5. (1) All authorities, bodies and persons performing functions and exercising powers in terms of this Act for the management of heritage resources must recognise the following principles:

(a) Heritage resources have lasting value in their own right and provide evidence of the origins of South African society and as they are valuable, finite, non-renewable and irreplaceable they must be carefully managed to ensure their survival;

(b) every generation has a moral responsibility to act as trustee of the national heritage for succeeding generations and the State has an obligation to manage heritage resources in the interests of all South Africans;

(c) heritage resources have the capacity to promote reconciliation, understanding and respect, and contribute to the development of a unifying South African identity; and

(d) heritage resources management must guard against the use of heritage for sectarian purposes or political gain.

(2) To ensure that heritage resources are effectively managed—

(a) the skills and capacities of persons and communities involved in heritage resources management must be developed; and

(b) provision must be made for the ongoing education and training of existing and new heritage resources management workers.

(3) Laws, procedures and administrative practices must—

(a) be clear and generally available to those affected thereby;

(b) in addition to serving as regulatory measures, also provide guidance and information to those affected thereby; and

(c) give further content to the fundamental rights set out in the Constitution.

(4) Heritage resources form an important part of the history and beliefs of communities and must be managed in a way that acknowledges the right of affected communities to be consulted and to participate in their management.

(5) Heritage resources contribute significantly to research, education and tourism and they must be developed and presented for these purposes in a way that ensures dignity and respect for cultural values.

(6) Policy, administrative practice and legislation must promote the integration of heritage resources conservation in urban and rural planning and social and economic development.

(7) The identification, assessment and management of the heritage resources of South Africa must—

(a) take account of all relevant cultural values and indigenous knowledge systems;

(b) take account of material or cultural heritage value and involve the least possible alteration or loss of it;

(c) promote the use and enjoyment of and access to heritage resources, in a way consistent with their cultural significance and conservation needs;

(d) contribute to social and economic development;

(e) safeguard the options of present and future generations; and

(f) be fully researched, documented and recorded.

Burial grounds and graves

36. (1) Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

- (3) (a) No person may, without a permit issued by SAHRA or a provincial heritage resources authority—
- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
 - (b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
 - (c) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
- (4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction or damage of any burial ground or grave referred to in subsection (3)(a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
- (5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection (3)(b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority—
- (a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
 - (b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.
- (6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority—
- (a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
 - (b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-interment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.
- (7) (a) SAHRA must, over a period of five years from the commencement of this Act, submit to the Minister for his or her approval lists of graves and burial grounds of persons connected with the liberation struggle and who died in exile or as a result of the action of State security forces or agents provocateur and which, after a process of public consultation, it believes should be included among those protected under this section.
- (b) The Minister must publish such lists as he or she approves in the Gazette.
- (8) Subject to section 56(2), SAHRA has the power, with respect to the graves of victims of conflict outside the Republic, to perform any function of a provincial heritage resources authority in terms of this section.
- (9) SAHRA must assist other State Departments in identifying graves in a foreign country of victims of conflict connected with the liberation struggle and, following negotiations with the next of kin, or relevant authorities, it may re-inter the remains of that person in a prominent place in the capital of the Republic.

General policy

47. (1) SAHRA and a provincial heritage resources authority—

- (a) must, within three years after the commencement of this Act, adopt statements of general policy for the management of all heritage resources owned or controlled by it or vested in it; and
 - (b) may from time to time amend such statements so that they are adapted to changing circumstances or in accordance with increased knowledge; and
 - (c) must review any such statement within 10 years after its adoption.
- (2) Each heritage resources authority must adopt for any place which is protected in terms of this Act and is owned or controlled by it or vested in it, a plan for the management of such place in accordance with the best environmental, heritage conservation, scientific and educational principles that can reasonably be applied taking into account the location, size and nature of the place and the resources of the authority concerned, and may from time to time review any such plan.
- (3) A conservation management plan may at the discretion of the heritage resources authority concerned and for a period not exceeding 10 years, be operated either solely by the heritage resources authority or in conjunction with an environmental or tourism authority or under contractual arrangements, on such terms and conditions as the heritage resources authority may determine.
- (4) Regulations by the heritage resources authority concerned must provide for a process whereby, prior to the adoption or amendment of any statement of general policy or any conservation management plan, the public and interested organisations are notified of the availability of a draft statement or plan for inspection, and comment is invited and considered by the heritage resources authority concerned.
- (5) A heritage resources authority may not act in any manner inconsistent with any statement of general policy or conservation management plan.
- (6) All current statements of general policy and conservation management plans adopted by a heritage resources authority must be available for public inspection on request.