

**PHASE 1 ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT
REPORT FOR PROSPECTING RIGHT APPLICATION ON THE FARMS:
CHESTER 199, CHAKANA 200, GAMAHAUDI 122, KURUMAN
MAGISTERIAL DISTRICT IN THE JOHN TAOLO GAETSEWE DISTRICT
MUNICIPALITY NORTHERN CAPE PROVINCE.**

DATE: NOVEMBER 2020

Document Information

Item	Description
Proposed development and location	Prospecting Right Application on the farms: Chester 199, Chakana 200 and Gamahaoudi 122, in the Northern Cape Province.
Purpose of the study	To carry out an archaeological and Heritage Impact Assessment to determine the presence/absence of cultural heritage sites and the impact of proposed prospecting.
Coordinates	27° 25' 702"S and 23° 55' 316"E (Burial site)
Municipalities	Magisterial District of Kuruman
Predominant land use of surrounding area	Grazing Land
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Date of Report	27/11/ 2020

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 Consulting (Pty) Ltd. Integrated Specialist Services (Pty) Ltd has no any business, personal, financial or other interest in the proposed development project 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 Consulting (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 the prospecting right application being proposed by Pan African Mineral Development Company (Pty) Ltd

Signed by



27/ 11/ 2020

Acknowledgement

The author acknowledges Joan Consulting (Pty) Ltd and Pan African Mineral Development Company (Pty) Ltd for their assistance with project information and responding to technical queries related to the project.

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EXECUTIVE SUMMARY

Pan African Minerals Development Company (Pty) Ltd (PAMDC) is applying for a prospecting right on the farms: Chester 199, Chakana 200 and Gamahaoudi 122, in the Northern Cape Province. The prospecting right application site is located near Hotazel in an area that is predominantly stock and game farming, tourism as well as mining (See Figure 1), and any listed development in this area must take full cognizance of potential occurrence of heritage resources. Various national and provincial legislative arms mandate pre-development assessment to ensure protection of heritage 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 developments.

Archaeological resources in the general project area stretches into deep time starting with australopithecines. 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 widespread 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. 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 retained by Joan Consulting (Pty) Ltd to conduct this Archaeological and Heritage Impact Assessment (AIA/HIA) Study for the proposed prospecting right application in Kuruman District Municipality of Northern Cape Province. This report includes an impact study on potential archaeological and cultural heritage resources that may be associated with the proposed prospecting. This study was conducted as part of the specialist input for the Environmental authorisation process. The project information has been passed to ISS research team by the project 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 survey was conducted to test this proposition and verify this prediction within the proposed prospecting site. The general project area is predominantly agriculture, 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.
- The prospecting right site is very accessible, and the field survey was effective enough to cover most sections of the project receiving environs. However, the boundary of the development site had limited access because of tall grass cover
- The immediate project area is predominantly agricultural, mining and residential.
- The study recorded scatters of undecorated potsherds within the proposed prospecting site

The report sets out the potential impacts of the proposed prospecting 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 construction at the development site 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.
- ❖ The recorded burial site must be protected during prospecting
- ❖ If archaeological materials are uncovered, work must cease immediately and the SAHRA/ North West PHRA 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 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. The entire prospecting site has been previously used for agriculture including large cattle kraals and fence lines.
2. Most farmsteads are clustered along main roads and rivers and there is a potential of occurrence of unknown burial sites.
3. It was established most isolated burial sites belong to farm workers some of them have since left the farms

4. Farm workers know the locations of most burial sites in the farms, as such they must be consulted during prospecting.

Recommendations

1. The proposed prospecting right application may be allowed to proceed subject to monitoring by a professional archaeologist during prospecting
2. Known burial sites must be marked and protected during prospecting
3. There is a possibility of encountering unknown burial sites, it is thus advised to seek information about burial sites from farmers and farm workers.
4. It is also advised that the Archaeology, Palaeontology and SAHRA Meteorites Unit is alerted when site work begins.
5. Strict and clear reporting procedures for chance findings must be followed by Pan African Mineral Development Company (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
LIA	Late Iron Age
NHRA	Nation Heritage Resources Act, Act 25 of 1999
PM	Project Manager
PHRA	Provincial Heritage Agency
SM	Site Manager
SAHRA	South African Heritage Resources Agency

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. Pan African Mineral Development Company (Pty) Ltd is applying for a prospecting right on the farms: Chester 199, Chakana 200 and Gamahaoudi 122, in the Northern Cape Province. Previous heritage studies (Kusel *et al* 2009, Orton 2016, 2017, Kruger 2015, Mlilo 2019) recorded scatters of lithic tools and isolated burial site within the broader project area-. The studies mention a range of heritage resources in the general project area. As such this current report must be read in conjunction with the previous HIA reports. This study focuses on the site ear marked for prospecting (see Figure 1).

The purpose of this Archaeology and Heritage Study is to assess presence/absence of heritage resources on the prospecting right site. 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 development. The assessment includes recommendations to manage the expected impact of the proposed prospecting. The report includes recommendations to guide heritage authorities in making appropriate decision with regards to the environmental approval process for the prospecting right application. The report concludes with detailed recommendations on heritage management associated with the proposed prospecting. Integrated Specialist Services (Pty) Ltd (ISS), an independent consulting firm, conducted an 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

Pan African Minerals Development Company (Pty) Ltd has lodged a prospecting right application for Manganese, Lead, Zinc, Limestone, Cobalt, Copper and Iron without bulk sampling. The prospecting method that will be used is diamond drilling, using drill rig. The development will primarily entail drilling a total of ten (20) boreholes. Each drill site will be about 100m². The drilled boreholes will be between 50m and 150m deep and a having diameter of about 0.8m to 1.5m. Each site will comprise of a borehole, drill rig site and a water sump. Recovered cores will be taken from each borehole to test for the targeted minerals at the laboratory.

Beside the drilling of holes which is the invasive method, there are also other prospecting activities to be undertaken which are non-invasive, thus methods that do not have physical contact with the environment. Non-invasive methods will be undertaken in phase 1 and invasive methods in phase 2 and 3 as explained below. The invasive activities will be undertaken as a result of the positive outcome of phase 1. The intended phases and the full description of what each phase entails are indicated below in a sequential order.

PHASE 1 - NON-INVASIVE ACTIVITIES

Literature Review

Literature survey is a comprehensive review of published and unpublished work from secondary data sources. Re-evaluation of previously explored areas of similar nature is very important at this stage to build conceptual geological model. This review will be conducted as an expectation guide of the field.

Geological Mapping

The area will be geologically mapped to update already existing information. All gathered information will be integrated with the existing information acquired during literature review assist with informed site planning.

Geochemical Sampling & Anomaly Screening

The target mineralization identified during the desktop study and mapping exercise would be further defined using surveyed line/grid based traversing geochemical soil / stream sediment and grab / float sampling activities.

Geophysical Surveys

Various methods of geophysical applications will be applied on the target areas if need be and this may include: ground magnetics, gravity and radiometric traversing on irregular grids.

PHASE 2 - INVASIVE ACTIVITIES

This phase entails the construction, operation and rehabilitation activities of the project, and they are explained in detail below:

Reconnaissance/Stratigraphical Drilling:

Phase 2 will commence with reconnaissance / stratigraphical drilling. The construction part entails the site preparation of clearing the site and bringing the equipment such as the drill rig and chemical toilets on site. Five (5) reconnaissance diamond drill holes are planned at this stage. These holes will serve to establish the stratigraphy of the project area and to establish mineralized portions within the stratigraphy. The boreholes will be drilled approximately 50m from the outcrop position (based on the geological map) and will be drilled to a depth of approximately 200m. The two boreholes will be correlated to establish the preliminary stratigraphical column. Secondly, the boreholes will be sampled and analyzed for mineral content and the results of the sampling will be used as a basis for the next phase of exploration drilling

Infill Resource Diamond Drilling

Drilling targets for this phase of drilling will be based on the results of the five (5) boreholes drilled during the reconnaissance phase coupled with the conceptual geological / structural model to be established from the geophysical studies and associated interpretation. If mineralized horizons are intersected, five (5) follow-up boreholes will be drilled. These Five (5) boreholes will also be sampled, analysed and the results of the sampling will be used as a basis for Phase 3 resource definition / exploration drilling. If economically viable reef is intersected in all the 5 boreholes drilled during reconnaissance and resource drilling campaigns, then a drill grid will be established as Phase 3 drilling.

This follow-up exploration drilling program will be conducted as the source for gaining ground truth information of the potential ore body and to prove continuity in the third dimension in detail, addressing reef facies, structure and metallurgical parameters. This drilling phase will define the orientation and shape of the ore body and also define the grade and tonnage and improve the geological confidence. Any follow up and infill boreholes will be planned and those will have to be drilled at a grid of 200m. It is estimated that the depth of each borehole will range from 50 – 200m.

Drill core will be logged (structure, lithology and facies), sampled and analyzed for Manganese, Iron, Copper, Zinc, Cobalt, Limestone, and Lead. Additional hole-deflections or holes will be drilled for value verification and to ascertain variance in metallurgical and mineralogical parameters. The current planning suggests that a total of 10 initial

exploration boreholes are planned. This drilling Programme should lead into a maiden inferred to indicate resource definition

Decommissioning and Rehabilitation

Upon completion of the drilling and logging process, the drilling equipment and all machineries will be removed from site. The drilled boreholes will be closed with a steel casing to suitable depth and a concrete cap will be placed on top with the exception of locations where boreholes will be drilled on cultivated land. Topsoil that will be removed from drill sites will also be replaced, and all disturbed areas (including roads) will be ripped and allowed to return to the natural state. The denuded area will be re-vegetated by spreading a seed mixture that represent the local vegetation.

PHASE 3

Pre-Feasibility Study

A multi-disciplinary pre-feasibility study will be done based on the geological model and indicated resource outlined in the previous phases. The outcome of the pre-feasibility study will be a complete mine and plant design, together with a preliminary EMP for the operations. The associated infrastructure, human resourcing, and social and labour plan will have been completed to a lesser accuracy. Should this prove positive, feasibility study work will commence.

Other Activities not listed on table 3 but to be conducted includes:

- Diesel power source vehicles and machineries will be used for the proposed activities. •
- There are currently existing roads that give access to the proposed site. The N4 which connects R371 and R372 roads together with few gravel roads give access to the site. In areas where it's problematic or with no access at all, temporary roads will be established (through trucks moving through the bush, not bush clearing).
- It is mandatory under the health and safety act that ablution facilities are made available where people will be undertaking any activities. Chemical toilets will be erected on site for the sanitation purposes. •
- Temporary contractor's yard will be erected on site and will entail site offices, ablution facilities as well as parking areas. No workers will stay on site.

Location of the proposed development

The prospecting right application site is approximately 40 km from Kuruman town and 100 km North of Hotazel town in John Taulo Local Municipality in the Northern Cape Province.

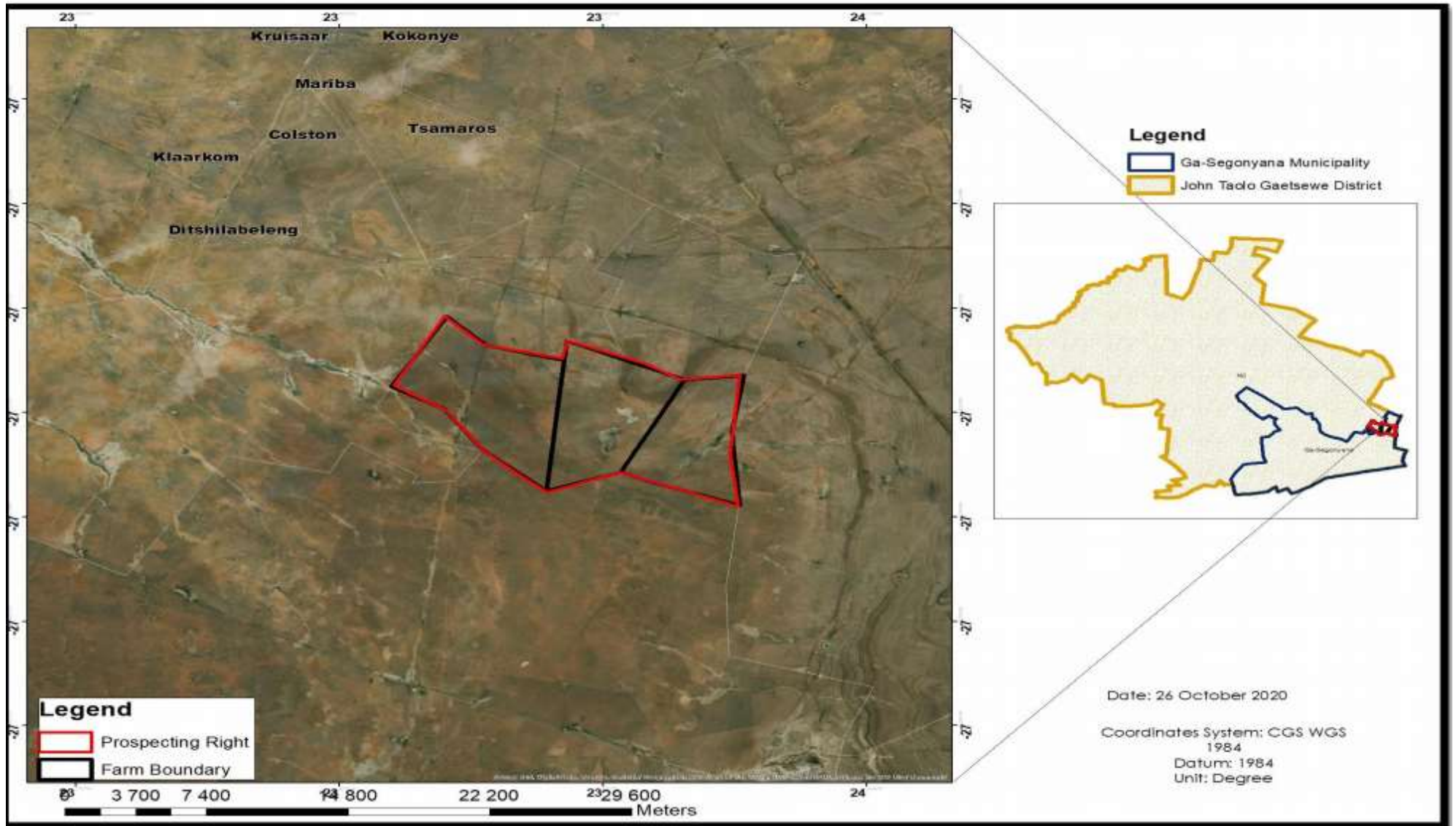


Figure 1: Locality Map of Prospecting Right Application Site (ISS 2020)

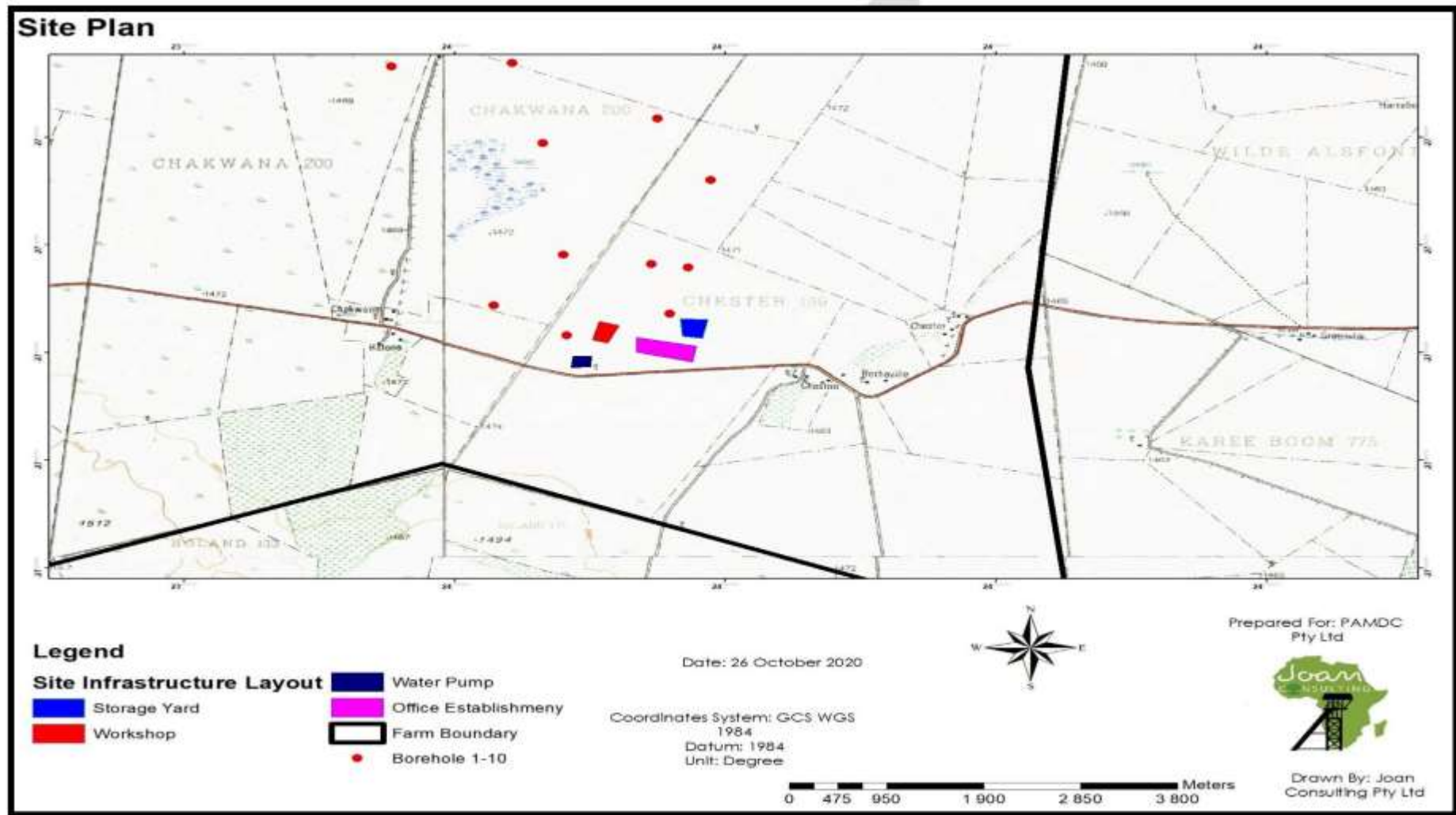


Figure 2: Prospecting Right Application site (Joan Projects 2020)

2 LEGAL REQUIREMENTS

Relevant pieces of legislations to the present study are presented here. Under the National Heritage Resources Act, 1999 (Act 25 of 1999) (NHRA), Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002), and the National Environmental Management Act, 1998 (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 (Pan African Minerals Development Company (Pty) Ltd (PAMDC), the environmental consultant, SAHRA or PHRA and interested and affected parties about existing heritage resources that may be affected by the proposed 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 infrastructure developments such as powerlines, roads and other destructive economic activities such as mining and agriculture. This true for the John Taolo 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 development outweigh the conservation issues at stake. When, for whatever reason the protection of a heritage site is not deemed necessary or practical, its research potential must be assessed and mitigated in order to gain data /information, which would otherwise be lost.

Table 1: Evaluation of the proposed 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	Yes
	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 site 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 development.
- Identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located in and around the proposed prospecting site;
- 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 development 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 PROSPECTING RIGHT APPLICATION SITE



Plate 1: Photo 1: View of road cutting across the prospecting right application site (Photograph © by Author 2020).



Plate 2: Photo 2: View of the prospecting right application site (Photograph © by Author 2020). Note that the site is predominantly grazing land



Plate 3: Photo 3: View of prospecting right application site. (Photograph © by Author 2020).



Plate 4: Photo 4: View of farming structures within the proposed project site (Photograph © by Author 2020)



Plate 5: Photo 5: View of prospecting right application site.



Plate 6: Photo 6: View of prospecting right application site



Plate 7: Photo 7: View of prospecting right application site



Plate 8: Photo 8: View of some of the farmsteads that occur in prospecting right application site. Note that due to security concerns farmsteads were not surveyed in detail.



Plate 9: Photo 9: View of livestock typical of the prospecting right application site

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 (Kusel 2009, Pelsler and Van Vollenhoven 2011, Mlilo 2015, 2018, 2019). 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 prospecting right application by Great 1 Line Invest (Pty) Ltd was considered in relation to the broader landscape, which is a key requirement of the ICOMOS Guidelines.

This document falls under the basic assessment phase of the HIA and therefore aims at providing an informed heritage-related opinion about the prospecting right application. This is usually achieved through a combination of

a review of any existing literature and a basic site inspection. As part of the desktop study, published literature and cartographic data, as well as archival data on heritage legislation, the history and archaeology of the area were studied. The desktop study was followed by field surveys. The field assessment was conducted according to generally accepted HIA practices and aimed at locating all possible heritage objects, sites and features of cultural significance on the prospecting right application site. Initially a drive-through was undertaken around the proposed prospecting site as a way of acquiring the archaeological impression of the general area. This was then followed by a walk down survey in the study area, with a handheld Global Positioning System (GPS) for recording the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed development in order to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed mining development. The field survey was undertaken in November of 2020 by an archaeologist, ecologist and the EAPs. The proposed prospecting application site was surveyed through tracks, footpaths which cut across the proposed prospecting site. The main focus of the survey involved a pedestrian survey which was conducted across the proposed prospecting site. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller than the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

The literature survey suggests that prior to the 20th century modern agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to Iron Age and historical sites (Bergh 1999: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation but is now dominated by livestock farming. Several infrastructure developments such as access roads and minor reticulation powerlines dominate the project area.

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 prospecting, such activities should be halted immediately, and a competent heritage practitioner, SAHRA 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 applicant 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. 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 prospecting layout (Figure 1).
- Due to security concerns in the farms, some farmsteads were not surveyed in detail.
- 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.

Consultations

Public consultations are being conducted by the project EAP and issues raised by Interested and Affected parties will be presented during project specialist integration meetings. A questionnaire relating to existence of burial grounds and graves as well as any other heritage sites was distributed to landowners within the prospecting right application site, it was agreed during one of the meetings with farmers that issues relating to heritage will be forwarded to the heritage specialist for inclusion in the report. Integrated Specialist Services (Pty) Ltd team consulted some farmers and farm workers who assisted in identifying isolated burial sites within their farms.

4 CULTURE HISTORY BACKGROUND OF THE PROJECT AREA

Stone Age Archaeology

Stone Age archaeology is prevalent in the larger geographical area, especially to the south and east of the study area but generally, the Magojaneng area does not seem to have attracted much of habitation, save for the two Late Stone Age rock shelters that occur north and south of GaMohaana hills. Perhaps the lack of large rock-shelters, the domination of exposed environments and the lack of preferred stone raw materials for tools, dissuaded early man (ESA ~ 2.6 million to 250 000 years ago) from occupying this part of the area. Further to the southwest and southeast of this area, the ESA is very well represented at sites such as Kathu Pan 1, Kathu Townlands, Bestwood 1 (Wilkins and Chazan 2012; Chazan *et al.* 2012; Walker *et al.* 2014) and Wonderwerk Cave (Thackeray *et al.* 1981). All of the above sites produced well-made Acheulean hand axes and cleavers, as well as Fauresmith lithic materials that are transitional between the Acheulean (ESA) and the MSA.

It must be stressed that ESA sites are not only limited to areas that are south of the study area but also occur to the northwest, especially close to Black Rock and Gloria Mines near the town of Hotazel (Kusel *et al.* 2009; Pelsner and Van Vollenhoven 2011).

The ESA is generally associated with the earlier Oldowan industry (marked by crude choppers and other unifacial core tools), followed by the still large but better fashioned hand axes and cleavers of the Acheulean technocomplex (Deacon and Deacon 1999). The Fauresmith Industry is characterized by a prepared core technology that produced both blades and points, making it transitional between the ESA and the MSA (~ 250 000 to 40-25 000 years ago) (Porat *et al.* 2010; Wilkins and Chazan 2012; Walter *et al.* 2014). Until recently, the Fauresmith Industry was poorly defined, being mostly identified based on the co-occurrence of Levallois points and hand axes (Beaumont and Vogel 2006: 224), and prepared cores, blades, and 'side-scrapers on flakes' (Beaumont 1990:79).

The MSA is better understood as a flake-technological stage characterized by faceted platforms, produced from prepared cores, as distinct from the core tool-based ESA technology (Barham and Mitchell 2008). In the area under study, MSA material mostly occur on the same sites with ESA material, suggesting longer sequences of occupation that have allowed researchers to probe into the behavioural changes that influenced these technological developments (Porat *et al.* 2010; Walker *et al.* 2014). Thus, characteristic MSA have been reported at sites such as Kathu Pan 1 (Wilkins and Chazan 2012), Wonderwerk Cave (Beaumont and Vogel 2006), but they also have been reported in isolated clusters (van Vollenhoven and Pelsner 2012). At Wonderwerk Cave, the MSA component was associated with pieces of haematite and several incised stone slabs, most with curved parallel lines that add to the behavioural shifts that went beyond stone tools and ushered in the appreciation of art (Beaumont and Vogel 2006).

More technological and behavioural changes than those witnessed in the MSA, occurred during the LSA (~ 40-25 000, to recently, 100 years ago), which is also associated with Homo Sapiens (Barham and Mitchell 2008). For the first time there is evidence of people's activities derived from material other than stone tools (ostrich eggshell beads, ground bone arrowheads, small, bored stones and wood fragments) (Deacon and Deacon 1999). The LSA people are also credited with the production of rock art (engravings and paintings), which is an expression of their complex social and spiritual beliefs (Parkington *et al.* 2008). In the area under study, the two LSA rock shelters to the south and the north of GaMohaana Hill are the only known archaeological remains that are closer to the study area (van der Walt 2013). Not much is known about these rock shelters, save for the fact that they have LSA material that include rock paintings (Morris 2010; van der Walt 2013: 18).

In terms of characterization, the lithic succession at Wonderwerk Cave serves as a benchmark for the Stone Age sequence of the Northern Cape (Beaumont and Vogel 2006; Kusel *et al.* 2009). The sequence comprises an uppermost LSA sequence that contains Ceramic LSA, Wilton and Oakhurst industries. Some researchers have named the earlier LSA industry of the region as the Oakhurst industry (some have labelled this local variant the Kuruman), characterized by rare retouched artefacts, most of which are large scrapers that are oblong with retouch on the side. However, it is not necessary to belabour the descriptions of these industries, especially because no LSA remains were recovered on the proposed development footprint. All the same, variants of the LSA industries were located at other sites such as Kathu Pan 1 (Porat *et al.* 2013) have been reported. At this site, ostrich eggshell fragments, beads and lithic artifacts attributed to Wilton and Albany industries were found. It also important to note that, it is still possible to encounter isolated finds during construction and when this happens, the procedure (described in detail below) for reporting chance finds must be followed.

Iron Age Archaeology

Agriculturalist communities entered southern Africa from West and East Africa around AD 200 and brought with them settled agriculture, metal working, animal husbandry, pottery making and social stratification (Huffman 2007). The view that all of these activities were introduced to southern Africa by these agriculturalists communities is still contested. The movement and spread of these EIA (~ AD200-1000) people within southern Africa seem to have been restricted to the summer rainfall (because of sorghum and millet farming) and they did not occupy much of the central interior Highveld area in South Africa. This perhaps explains the paucity of EIA sites in the study area. Ecologically, EIA preferred to settle on the alluvial soils near rivers for agricultural purposes and access to water. It was not until the mid-second millennium AD that serious Iron Age occupation began in the larger geographical area (excluding the study area) of this part of the Northern Cape.

The study area falls known within the fringes of the distribution of LIA (~ AD1100-1840) people who made Olifantspoort facies (ancestral Sotho-Tswana speakers) dated between AD1500 and AD1700 (Huffman 2007: 191). Olifantspoort facies represents the second phase of the Moloko sequence and settlements with people that made this type of ceramics are distributed in the area to the northeast of the study area, between the Vaal River and Pretoria. The people, just like the markers of Thabeng facies (third phase of the Moloko sequence AD1700-1840), settled in aggregated clusters where space was also demarcated by extensive stone walling. The extensive walled settlements around Kuruman are historically associated with the Tswana people such as the Rolong, Tlharo and Thlaping (De Jong 2010; Pelser 2012; Fourie 2013). Typologically, this type of walling is called Type Z, which is prevalent in the Free State and mark the most southerly expansion of Sotho-Tswana speakers, up to the edge of a viable farming environment (Nkhasi 2008). Type Z settlement units have large compact central primary enclosures, "usually from three to eight in number and often so close as to be touching' but they also have smaller primary enclosures which may be linked by secondary walling (Maggs, 1976: 40).

The nature of the interaction between the emigrant Tswana groups and Khoesan people who were already in this area is complex but there are indications of acculturation (Breutz 1981) and intensive trading (Goodwin 1956). Some of the activities that formed the locus for trade and interaction between the Tswanas and the Khoesan groups in this area are specularite mining and ivory hunting. For instance, at sites such Blinkklipkop (about 80km to the south of the study area), a Khoesan specularite mine sites dating to as early as AD800, there is evidence of either trade with or occupation of the mine by the Thlaping peoples around 1801 (Thackeray et al. 1983). Specularite was used for non-metallurgical purposes such as pottery decoration and bodily adornment (Hall 1985), and was a prized trade commodity, together with ivory and other items during the second millennium trade boom in this part of southern Africa. Thus by the mid-19th century (and probably earlier), the Thlaping people were purchasing glass beads, iron, copper, tin and bronze wares from other northern Sotho-Tswana groups such as the Kwena and Hurutse, and exchanging these items with the Khoesan groups to the southwest (Goodwin, 1956: 256).

Of the Tswana groups around the present study area, the Thlaping might be of interest because of their connections with the site of Dithakong near Kuruman (De Jong 2010: 35-36; Pelser 2012). This site, which at one point was a Thlaping capital, appears to be the only area in which there is direct archaeological evidence for settlement in the form of stone walling (Maggs 1972; Magoma 2013: 28). Socio-political tensions and permutations necessitated the shifting of most Tswana capital of which Dithakong was no exception. For instance, during the Batlhaping capital was first at Nokaneng around the year 1775, before it was moved to Dithakong on the Mashoweng River, and then at Kuruman in 1801. At around 1806 they returned to Dithakong but settled a short distance from the previous site. In 1812 people were contemplating returning to Nokaneng with an intermediate stop at Kuruman, where they re-established themselves in 1817. Thus in 1820 when Kuruman was the capital and comprised 25 wards, Dithakong

was of similar size. Thus, the capital had moved three times in twenty years and suffered one major split which removed about half of its population. The reasons for these movements are not clear. This mobility presents a problem in the interpretation of the archaeological evidence and it helps to explain why many Iron Age sites have shallow accumulation of waste material (Maggs 1972).

Nonetheless, in the 1920s, the capital of the Batlhaping was permanently moved to Kuruman. All the same, none of these LIA sites were identified in the study area.

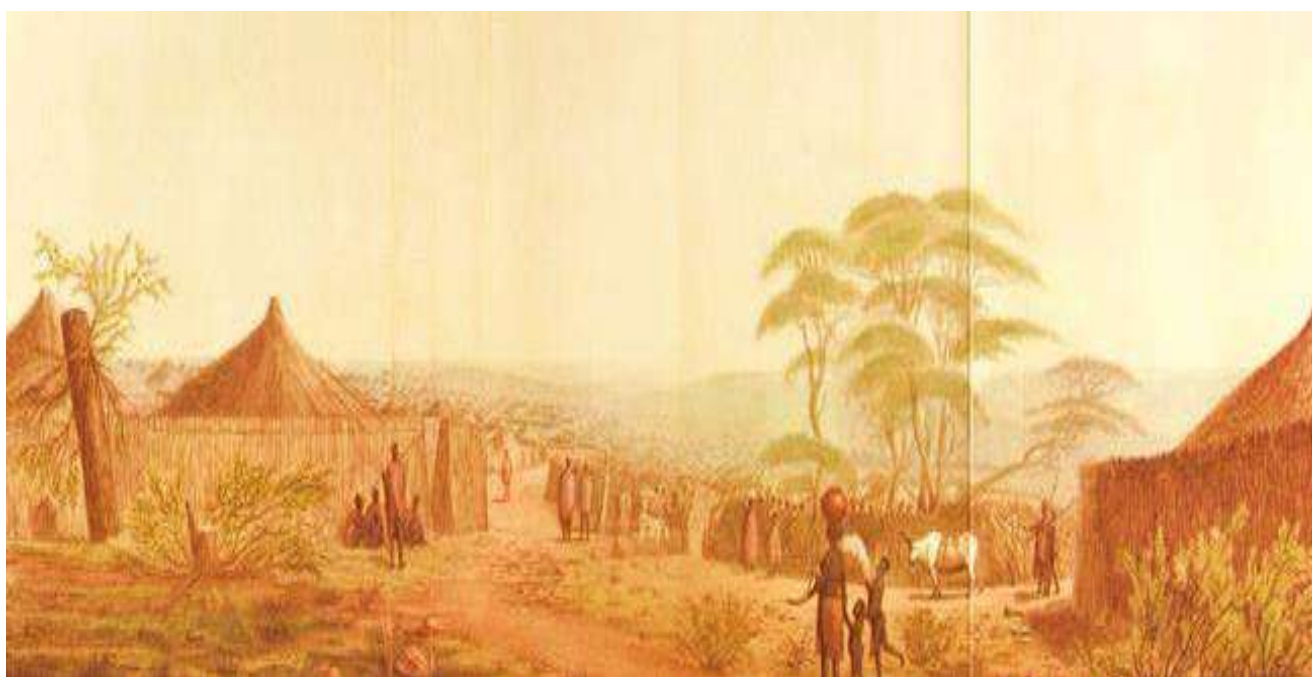


Plate 10: Photo 10: 'A view in the Town of Litakun' (Dithakong), a southern Tswana town near present-day Kuruman.

An engraved and coloured reproduction of an original drawing made by William Burchell in July 1812 (From Burchell, W.J., 1824, *Travels in the Interior of Southern Africa*. V II, London: Longman, Hurst, Orme, Brown and Green) <http://www.apc.uct.ac.za/news/tuning-obo#sthash.PkrFm3EY.dpuf> (accessed on 30 August 2015).

Contemporary heritage

Southern Africa was networked with the literate world for several centuries, but the period of written history in the study area corresponds to the arrival of white travellers, hunters, missionaries and adventurers from the Cape in the 1800s. Notable amongst them include PJ Truter's, William Somerville, Robert Moffat, Andrew Smith and John Campbell. The first arrivals into the study area may be PJ Truter's and William Somerville who in 1801 reached Dithakong at Kuruman (Pelser 2012). Some of later travellers into this area kept diaries that today form part of invaluable history about indigenous communities whom they travellers interacted with (see Figure 5 and 6).

European explorers such as Dr. Hinrich Lichtenstein (in 1805) and Dr. Andrew Smith (in 1835) reached Kuruman and met Tswana-speaking people (Bergh 1999). It should be noted that most of the early African-colonial interaction in this area centred around the nearly two-century old London Mission Society station at Kuruman, established by James Read in 1817 but popularized by Robert Moffat and his wife, three years later. Since the arrival of the Moffats in 1820, the mission has been known as The Moffat Mission Station (Figure 5, plate 12).

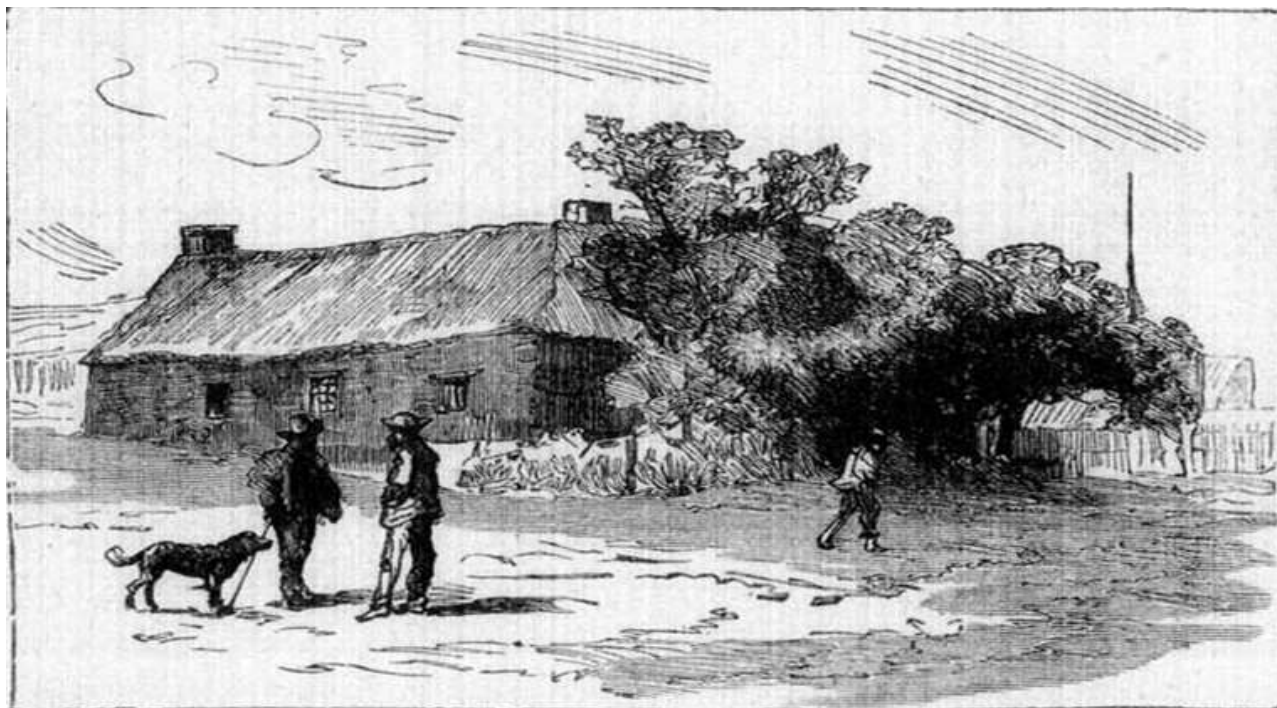


Plate 11: Photo 11: Photo A&B shows a drawing of the Old Mission House at Lattakoo which is now known as Kuruman (David J. Deane 2005. Robert Moffat: The Missionary Hero of Kuruman. March 16, 2005 [EBook #15379]http://www.gutenberg.org/files/15379/15379-h/15379-h.htm#CHAPTER_IV accessed 30 August 2015.

Besides the isolated incursions by traders, hunters, and missionaries permanent and mass-movement of white settlers only took root in the late 1800s with the arrival of Dutch speaking farmers (Voortrekkers) who were protesting and escaping British rule in the Cape Colony (Ross 2002: 39). Yet even this incursion was not permanent as yet because by 1897 most of them white settlers around the Kuruman River had moved away (Fourie 2013). It took the great drought of 1907 and 1908 for many farmers of the then Cape Colony to move into these areas along the edge of the Kalahari Desert in search of better grazing for their cattle (Smit 1966). Nonetheless, significant urban development in this area has been focused around the 'Eye' and the water course springing from it leading to the evolution of the town of Kuruman, from the late nineteenth century (Morris 2010). When in 1885 Britain declared a Protectorate over Bechuanaland and the Kalahari (on 23 March) and then divided the Protectorate was divided into two parts (on 30 September 1885), the area south of the Molopo (including the study area) became the

Crown Colony of British Bechuanaland with its capital at Vryburg (Fourie 2013) (Tlou and Campbell 1997). Ten years later this area was included in the Cape Colony accordance to Act 31 of 1895 (Smit 1966) and the Lower Kuruman Native Reserves well as a number of other so-called native reserves were established by virtue of Bechuanaland Proclamation No. 220 of 1895 . The study area lies on the fringes of this Lower Kuruman Native Reserve.

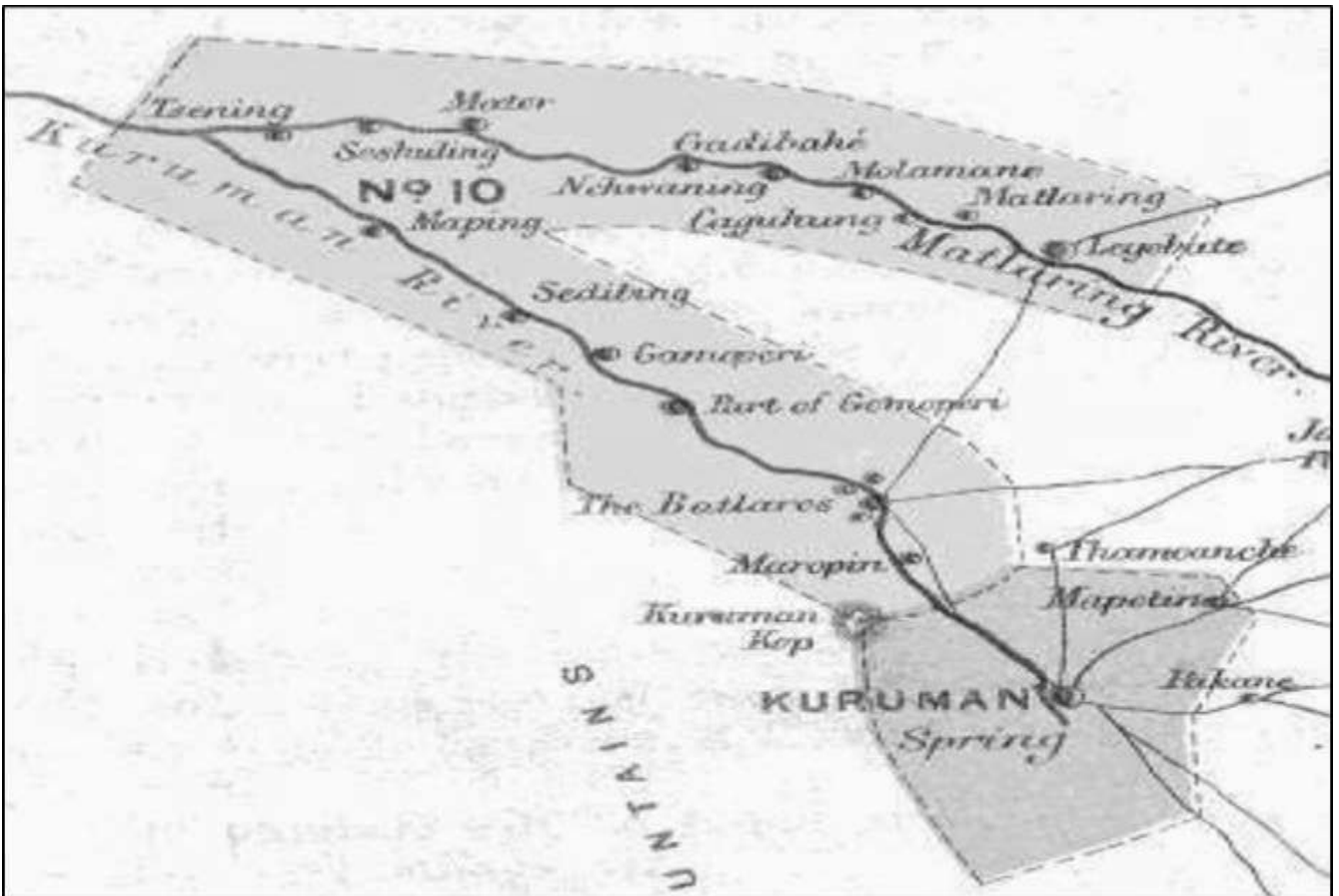


Figure 3: Map showing the original demarcation of the Lower Kuruman Native Reserve (Fourie 2013: 35)

Another impetus for the occupation of the Kuruman area was related to events that were ignited outside the African continent. Thus, when the First World War (1914-1918) broke out, and the South African Union Government joined the coalition forces and attacked German South West Africa (now Namibia). To sustain the Union troops along the way, a number of boreholes were sunk along the banks of the Kuruman River at places such as Eensaam, Kameelrus, Murray, Springputs and Van Zylsrus (Van der Merwe 1949; Smit 1966;). After the war, even more boreholes were sunk by the Department of Lands as opportunistic white farmers established themselves at these localities as borehole watchmen so that they could be allowed free grazing rights on the surrounding land (Smit 1966). All of this history produced heritage landmarks along the Kuruman River, but it is significant to note that none

of these resources are located closer to the area of the proposed development. Parallel to the urban development is the history of manganese mining that the surrounding region is well known for today. Manganese is used in the manufacture of carbon steel and has been mined at such places as Hotazel and Black Rock (Fourie 2013). These mines are however, located far away from the development footprint and no mining heritage has been located during the study.

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 an relationship with the study area per se, even though several other places in the general area such as Old Moffat Mission in Kuruman do have intangible heritage.

SAHRIS Database and Impact assessment reports in the proposed project area

Several archaeological and heritage impact studies were conducted for mining and infrastructure developments in the vicinity of the proposed prospecting site. These studies include a study conducted by Kusel et al in (2009) within the current prospecting site (Nchwaning 267) (see Figure 1 & 2). Therefore, this report must be read together with Kusel et al (2009) report. Kusel et al (2009)'s survey concluded that stone artefacts were very rare within the proposed prospecting area. Kusel et al (2009) did not identify any archaeological and heritage remains within the current proposed prospecting site, however he identified a site within the Ga Mogara River bed out of the current study site (see Figure 3). Kusel et al (2009) indicates that the Ga Mogara River bed may bear unknown Stone Age sites. As such no prospecting should take place within 100m distance from the river bed. Orton (2016 & 2017), Kruger (2015) and Hutten & Hutten (2013) have all identified a similar mix of ESA and MSA archaeological material along the Ga-Magara River in the general study area. The artefacts are made on the local cryptocrystalline silica rock types. The formal ESA tools include Acheulian hand axes or large cutting tools (LCT's). The MSA flakes and blades are characterised by the faceted striking platforms that indicate the use of prepared cores. Kruger (2015) posits that the Ga-Magara River would have been an important source of water in this arid environment. The other studies include powerline and substation projects completed by Kaplan, J. (2009), Van der Walt (2013); Fourie, (2013b), Hutten, L. & Hutten, W. (2013) Magoma (2013), Bandama (2015), Mlilo (2016), Kruger (2015a, 2015b), Pelser, A. & van Vollenhoven, A.C. 2011, Pelser (2012), Van Schalkwyk (2010, 2015a, 2015b, 2016), Van Vollenhoven, A.C. (2012) and Webley, L & Halkett (2008). Van Schalkwyk (2010, 2016) examined sites west of

Hotazel town and found no cultural resources to be present in either location. Other studies further afield (e.g. Fourie 2013) have found a similar rareness of archaeological material in open, sandy areas. However, along the margins of the Kuruman River and Ga-Mogara River, stone artefacts have been reported (Hutten & Hutten 2013) and (Kusel et al 2009). These artefacts are low density and appear to be largely from the Middle Stone Age (MSA), although some may be Later Stone Age (LSA). Nilssen (2018) concludes that several of the heritage studies around Hotazel have commented on the almost total absence of heritage resources. Surveys have revealed that there are large tracts of land where virtually no archaeological material occurs (Orton 2016, 2017; Van Schalkwyk 2010, 2016). Early Stone Age (ESA) material seems to be largely absent, despite how common it is at Kathu, 50 km to the south, where extensive research has been carried out (e.g. Chazan et al. 2012; Porat *et al.* 2010).

5 RESULTS OF THE ARCHAEOLOGICAL/HERITAGE ASSESSMENT STUDY

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position. The severe impacts are likely to occur during clearance, and drilling, indirect impacts may occur during movement of prospecting equipment. The excavation for foundations and fence line posts will result in the relocation or destruction of all existing surface heritage material such as potsherds. Similarly, the clearing of access roads will impact material that lies buried in the surface sand. Since heritage sites, including archaeological sites, are non-renewable, it is important that they are identified, and their significance assessed prior to construction. It is important to note, that due to the localised nature of archaeological resources, that individual archaeological sites could be missed during the survey, although the probability of this is very low within the prospecting right application site. Further, archaeological sites and unmarked graves may be buried beneath the surface and may only be exposed during construction. The purpose of this study is to assess the sensitivity of the area in terms of archaeology and to avoid or reduce the potential impacts of the proposed prospecting by means of mitigation measures (see appended Chance Find Procedure). The study concludes that the impacts will be negligible. The following section presents results of the field survey. The following section presents results of the archaeological and heritage survey conducted within the proposed prospecting site.

Table 1: Summary of Results

Heritage resource	Status/Findings
Buildings, structures, places and equipment of cultural significance	Farmsteads exist on all the farms earmarked for prospecting
Areas to which oral traditions are attached or which are associated with intangible heritage	None exists on the study area
Historical settlements and townscapes	None recorded on the study site
Landscapes and natural features of cultural significance	None
Archaeological sites	None recorded within the proposed prospecting site
Graves and burial grounds	One burial site recorded within the proposed prospecting site
Movable objects	None

Overall comment	Although only one burial site was recorded within the proposed prospecting site, there is a possibility of encountering unmarked graves covered by sand dunes
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Archaeological and Heritage Sites

The proposed prospecting right application site did not yield any confirmable archaeological sites or material. Based on the field study results and field observations, it is the considered opinion of the author that the receiving environment for the proposed prospecting is medium to high potential to yield previously unidentified archaeological sites during prospecting work. As such the chance find procedure must be adhered to during prospecting.

Buildings and Structures older than 60 years

Farmhouses and infrastructure occur in the prospecting right application site, however, due to security concerns in the farms, farmsteads were not surveyed in detail. The field survey identified farmhouses whose ages could not be confirmed during the study. Note that buildings and structures older than 60 years regardless of their condition are protected by Section 34 of the NHRA. However, it was assumed that farmsteads are protected by DMR regulations which prohibits drilling and blasting within 500m radius of any building or graves.

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 identified one burial site within the site earmarked for the prospecting right application (see Plate 12, 13 & 14). The burial site is located at GPS Coordinates 27° 25' 702"S and 23° 55' 316"E. The survey recorded ten (10) graves at the site. Eight graves are marked by oval shaped stone piles and two are marked by tombstones and inscribed headstones (Plate 12, 13, 14, 15 & 16). The survey noted that seven graves are for adults and 3 are for children. The burial site is fenced although the fence is now falling off due to lack of maintenance. Based on the inscriptions on two of the graves, it seems all the graves at this site are younger than 60 years. The burial site is associated with a farmstead located approximately 900m from the site. However, due to security and covid concerns in the farms, farmsteads were not surveyed in detail. We sent a questioner requesting landowners to declare

sensitive heritage sites such as burial grounds and graves in their farms. This method was effective in identifying grave sites. We noted that landowners and farm workers know the location of sensitive heritage sites within their farms. The possibility of encountering previously unidentified burial sites is medium to high within the proposed prospecting site, should such sites be identified during prospecting, they are still protected by applicable legislations and they should be protected (also see Appendixes for more details). Some of the graves are likely to be older than 60 years and as such 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 12: Photo 12: View of burial site within the proposed prospecting site. Note that most farmsteads and burial sites occur along roads.



Plate 13: Photo 13: View of burial site within the prospecting right application site



Plate 14: Photo 14: View of one of the two graves marked by tombstones and inscribed headstone



Plate 15: Photo15: Full view of grave marked by tombstones and inscribed headstones.



Plate 16: Photo 16: View of grave marked by brick lining and an inscribed headstone

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.

Public Monuments and Memorials

The survey did not identify any historical monument and public memorials within the prospecting right application site. There are no monuments or plaques 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 John Taulo Local Municipality of the North West Province. The proposed prospecting will not impact on any listed monuments and memorials in the project area.

Battle fields

No known battles or skirmishes associated with the Anglo-Boer war and the struggle against apartheid were fought on the proposed prospecting right application site.

Palaeontology

The Palaeontological sensitivity map shows that the proposed project area is located within a generally sensitive area. The impacts of the proposed development on palaeontology is low (Baker 2017). However, if any fossil deposits are discovered during any phase of the development, the contractor responsible for construction should alert SAHRA (South African Heritage Research Agency) immediately so that appropriate mitigation (e.g. recording, sampling or collection) can be taken by a professional palaeontologist.

Archaeo-Metallurgy, Prehistoric Mining and Mining Heritage

There are historical and current mining activities in the entire Northern Cape Province, however none are located on the proposed prospecting site.

Mitigation

Prospecting teams must be inducted on how to identify heritage resources during prospecting and the reporting procedure in accordance with the appended Chance find procedure. The recorded burial site must be marked and avoided during prospecting. Prospecting will further engage with landowners and farm workers to assist in identifying known sensitive heritage sites such as burial grounds and graves that might have been missed during the field survey. The prospecting teams will have a copy of the Chance find procedure during prospecting.

6 CUMMULATIVE IMPACTS

Cumulative impacts are defined 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 development 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 prospecting 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 prospecting 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 construction 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. There are existing infrastructure developments and agriculture activities within the proposed prospecting site. 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 proposed development site given that archaeological remains occur on the surface. Cumulative impacts that could result from a combination of the proposed prospecting 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. 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 have the potential to crack/damage rock art covered surfaces, which are known to occur in the greater study area.

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. Sites of archaeological significance were identified, and cumulative effects are 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 that need attention are related to the impacts of access roads and impacts to surface archaeological remains. 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 prospecting. Movement of heavy prospecting equipment 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 construction vehicles/equipment are not monitored to avoid driving through undetected heritage resources.

7 ASSESSMENT OF SIGNIFICANCE

The significance of the impacts will be assessed considering the following descriptors:

Table 2: Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been slightly modified and have a high conservation importance (high sensitivity*).

Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Extent}) \times \text{Probability}$$

The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the below.

Table 3: Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

Table 4: Operational Phase

Impacts and Mitigation measures relating to the proposed project during Operational Phase														
Activity/Aspect	Impact /	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Clearing and prospecting	Destruction of archaeological remains	Cultural heritage	-	6	1	4	5	55	<ul style="list-style-type: none"> Chance find procedure apply 	6	2	4	3	36
	Disturbance of graves	Cultural heritage	-	6	1	4	5	55	<ul style="list-style-type: none"> Burial sites must be mapped Landowners and farm workers must be requested to assist in identifying burial sites that might have been missed during the survey Recorded burial site must be marked to avoid accidental damage during prospecting. 	2	1	1	1	4
	Disturbance of buildings and structures older than 60 years old	Operational	-	4	1	2	2	14	<ul style="list-style-type: none"> Adhere to DMR Regulations regarding drilling and blasting near buildings and heritage sites 	4	1	2	2	14
Movement of equipment	Destruction public monuments and plaques	Operational	-	2	1	1	1	4	<ul style="list-style-type: none"> Mitigation is not required because there are no public monuments within the mining right application site 	2	1	1	4	4

Based on the results of the Impact Assessment Matrix the proposed development site is 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 Northern Cape 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 development site 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 Northern Cape Province. The local communities consider the project area a cultural landscape linked to their ancestors and history. However, the proposed prospecting 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 Northern Cape Province.

Scientific value

Past settlements and associated roads and other auxiliary infrastructure developments and disturbance within the HIA Study Area associated with the Prospecting Right Application 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 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 development especially given the fact that the development will add value to the human settlements and activities already taking place. Some sections of development site 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 Heritage studies for various infrastructure developments and mining developments were conducted since 2006. Although these studies recorded sites of significance for example Kusel et al (2009) van Schalkwyk, (2015), Van der Walt (2013); Magoma (2013), Bandama (2015), Mlilo (2016), the recorded sites are out of the current prospecting site. It is important to note that the current prospecting site was previously surveyed by Kusel et al 2009 and the current study also confirmed the scarcity of archaeological remains within the prospecting site (see Figure 1, 2& 3). The current study should be read in conjunction with Kusel et al (2009) conducted in the proposed project area. The archaeology of the Northern Cape is rich and varied, covering long spans of human history (Morris 2006). In the Northern Cape ESA assemblages, including the Fauresmith, tend to occur on the margins of seasonal rivers, semi-permanent water holes or pans (Pelser 2010) see Kusel et al (2009). The significance of sites so far recorded in the study compared to other sites indicate that they are of lesser importance because they are small scatters and confined to the GaMogara and Kuruman River beds. The region's remoteness of the Northern Cape may be a reason for the lack of archaeological research in the area. Probably because of its dryness, the area has probably been relatively marginal to human settlement for most of its history (Fourie 2010, Kusel et al 2009, Morris 2006, Pelser 2010). Some areas are richer than others, and not all sites are equally significant, and this is true for the current prospecting site. Thus Webley (2018) concludes that Studies further to the west, along the Go-Magara River have confirmed the presence of large scatters of ESA and MSA material. However, all archaeological studies to the south of Hotazel in the general vicinity of the study area have confirmed the almost total absence of any archaeological material. The lack of 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 grazing area and have reduced sensitivity for the presence of high significance physical cultural site remains, be they archaeological, historical or burial sites, due to stamping and overgrazing by livestock.
2. Limited ground surface visibility on sections of the proposed prospecting site 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 within the prospecting site. 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 proposed prospecting right application site. Significance of the sites of Interest (prospecting site) is not limited to presence or absence of physical archaeological sites.

10 RECOMMENDATIONS

The study did not find any permanent barriers to the proposed prospecting right application. It is the considered opinion of the author that the proposed prospecting 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.

- The proposed prospecting may be approved to proceed as planned under observation that project work does not extend beyond the surveyed site.
- The recorded burial site must be marked to avoid any accidental damage during prospecting.
- Any additional information regarding occurrence of sensitive heritage sites must be included in the updated heritage report.
- Should any unmarked burials be exposed during construction, 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 prospecting 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 prospecting right application to proceed as planned with special commendations to implement the recommendations here in made.

- If during development, operational 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 activities 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
- The applicant is reminded that unavailability of archaeological materials (e.g. stone tools and 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 footprint impact of the proposed prospecting activities should be kept to minimal to limit the possibility of encountering chance finds within the proposed development site.
- 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 construction 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 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. Burial grounds associated with farmsteads occur in the proposed prospecting site. All known heritage sites can easily be avoided during prospecting because drilling is done at points in most cases far from each other and the points can be shifted if known heritage sites are identified. In terms of the archaeology and heritage in respect of the proposed prospecting site, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, remains and the applicant and contractors are advised to be diligent and observant during prospecting, should prospecting activities commence on the site. The procedure for reporting chance finds has clearly been laid out (see Appendix 3). This report concludes that the prospecting right application may be approved by SAHRA to proceed as planned subject to recommendations herein made and heritage monitoring plan being incorporated into the 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

Almond, J. 2016. Recommended exemption from further palaeontological studies: proposed Hotazel Solar Park on the farm Hotazel Annex Langdon (F278/0), Joe Morolong Local Municipality, Northern Cape. Unpublished report prepared for Aurecon South Africa (Pty) Ltd. Cape Town: Natura Viva.

Barham, L. and Mitchell, P. 2008. *The first Africans: African archaeology from the earliest toolmakers to most recent foragers*. Cambridge: Cambridge university press

Beaumont, P.B. and Morris, D. 1990. *Guide to archaeological sites in the Northern Cape*. Kimberley: McGregor Museum.

Beaumont, P. B. and Vogel, J. C. 2006. On a timescale for the past million years of human history in central South Africa. *South African Journal of Science* 102: 217-228.

Bergh, J.S. (ed.) 1999. *Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies*. Pretoria: J.L. van Schaik.

Deacon, H.J. and Deacon, J. 1999. *Human beginnings in South Africa: Uncovering the secrets of the Stone Age*. Cape Town: David Philip

De Jong, R.C. 2010. *Heritage Impact Assessment report: Proposed Manganese and Iron Ore Mining Right Application in respect of the Remainder of the farm Paling 434, Hay Registration Division, Northern Cape Province*. Unpublished Report Cultmatrix Heritage Consultants Project 2010/23 May 2010 for Kai Batla.

Fourie, W. 2013a. *Proposed Lehating Mining (Pty) Ltd underground manganese mine on Portions 1 of the Farm Lehating 714 and Portion 2 of the farm Wessels 227, approximately 20km northwest of Hotazel, Northern Cape Province*. Unpublished report prepared for SLR Consulting (Africa) (Pty) Ltd

Fourie, W. 2013b. *Heritage Impact Assessment for the proposed prospecting activities for Tshipi é Ntle Manganese Mining on Remaining extent of the farm Wessels 227 and Portions 1 and 2 and the remaining extent of the farm Dibiaghomo 226 in the Northern Cape Province*. Pretoria: Unpublished report.

Hall, S. 1985. Excavations at Rooikrans and Rhenosterkloof, Late Iron Age sites in the Rooiberg area of the Transvaal. *Annals of the Cape provincial museums (human sciences)* 1 (5): 131-210

Huffman, T.N. 2007 *Handbook to the Iron Age: The archaeology of pre-colonial farming societies in southern Africa*. Scottville: University of KwaZulu Natal Press

Hutten, L. & Hutten, W. 2013. *Heritage Impact Assessment report for the farms Wessels 227 Portion 2 and Boerdraai 228*. Cape Town: Unpublished report.

Kaplan, J. 2009. *Archaeological Impact Assessment, the proposed Whitebank Keren Energy Solar Plant on Farm 77 near Kuruman, Northern Cape. Report prepared for EnviroAfrica. Agency for Cultural Resource Management.*

Kruger N. 2016. *Archaeological Impact Assessment (AIA) of areas demarcated for proposed photovoltaic power plants (EAST 2 and East 3 Solar Parks and access roads) on the remainder and portion 2 of the farm East 270, Joe Morolong Local Municipality, Northern Cape Province.*

Kusel, U., M., Van der Ryst. 2009. *Cultural Heritage Impact Assessment of Manganese Mining Areas on the farms Belgravia 264, Santoy 230, Gloria 226 and Nchwaning 267, at Black Rock, North of Kuruman, Kgalagadi District Municipality Northern Cape Province. Unpublished Report African Heritage Consultants September 2009. For Assmang Limited.*

Magoma, M. 2013. *Phase 1 Archaeological Impact Assessment Specialist Study Report for The Proposed Prospecting for Mining of Minerals On Portions 1, 2 Remainder Extent of the Farm 219 And Lower Kuruman 219 In Kuruman Area Within Ga-Segonyana Local Municipality, John Gaetsewe District, Northern Cape Province. Unpublished report.*

National Environmental Management Act 107 of 1998

National Heritage Resources Act NHRA of 1999 (Act 25 of 1999)

Nilssen, P. 2018. *Proposed Hotazel Solar and Grid Connection on Remaining Extent (Portion 0) of the Farm York A 279, Portion 0 of Hotazel 280, Portion 11 of the Farm York A 279 and Portion 3 of the Farm York A 279, District of Hotazel, Northern Cape Province. Scoping Report.*

Orton, J. 2016. *Heritage Impact Assessment for proposed power lines near Hotazel, Kuruman Magisterial District, Northern Cape. Unpublished report for Aurecon South Africa (Pty) Ltd.*

Orton, J. 2017. *Heritage Impact Assessment for the Proposed Hotazel Solar Farm on the Annex Langdon 278, Kuruman Magisterial District, Northern Cape. Unpublished report for Aurecon South Africa (Pty) Ltd*

Parkington, J, Morris, D, & Rusch, N. 2008. *Karoo Rock Engravings: Follow the San. Cape Town: Creda Communications.*

Pelser, A. & van Vollenhoven, A.C. 2011. *A report on a heritage impact assessment (HIA) for a proposed new rail crossing over the Gamagara River for the Gloria Mine operations, Assmang Black Rock, on Gloria 266, North of Hotazel, Northern Cape. Pretoria: Unpublished report.*

Pelser, A.J. & A.C. van Vollenhoven. 2010. A Report on an Archaeological Impact Assessment (AIA) for proposed mining operations on the remainder of the farm Paling 434, Hay Magisterial District, Northern Cape. Unpublished Report AE1030 May 2010 for Cultmatrix Heritage Consultants.

Pelser, A.J. 2012. *A report on an Archaeological Impact Assessment (AIA) for a proposed housing development on ERF 675, Kuruman, in the Northern Cape.* Unpublished report prepared for Thabo Phokoje.

Pistorius, J.C.C. 2006. *A Phase I Heritage Impact Assessment (HIA) study for the proposed new United Manganese of Kalahari (UMK) Mine on the farms Botha 313, Smartt 314 and Rissik 330 near Hotazel in the Northern Cape Province of South Africa.* Unpublished report prepared for Metago Environmental Engineers.

Ross, R. 2002. *A concise history of South Africa.* Cambridge: Cambridge University Press.

Smit, A.P. 1966. *Wateroog in die Dorsland: Ned. Geref. Kerk Kuruman 1916-1966. Kuruman: Kerkraad van die Gemeente Kuruman.*

Snyman, P.H.R. 1992. *Kuruman 1800-1990*, PhD Thesis, University of South Africa.

Thackeray, A.I., Thackeray, J.F. and Beaumont, P.B. 1983. Excavations at the Blinkklipkop specularite mine near Postmasburg, northern Cape. *South African Archaeological Bulletin* 38:17-25.

Tlou, T. and Campbell, A. 1997. *History of Botswana.* Gaborone: Macmillan.

Van de Merwe, P.J., 1949. *Pioniers van die Dorsland, Kaapstad: Nasionale Pers.*

Van der Walt, J. 2013. *Archaeological Impact Assessment for The Proposed Prospecting Right of a Quarry on the Farm Gamohaam 438 Portion 1 In The Kuruman Magisterial District.* Unpublished report.

Van Schalkwyk, J.A. 2010. *Archaeological impact survey report for the proposed township development in Hotazel, Northern Cape Province.* Unpublished report 2010JvS028.

Van Schalkwyk, J.A. 2015a. *Cultural heritage impact assessment report for the development of the proposed Lehating 132kV power line and substation, northwest of Hotazel, Northern Cape Province.* Unpublished report 2015JvS045.

Van Schalkwyk, J.A. 2015b. *Cultural heritage impact assessment for the proposed development of the Tshipi-Borwa 132kV power line and substation, south of Hotazel, Kgalagadi district municipality, Northern Cape Province.* Unpublished report 2015JvS073.

Van Schalkwyk, J.A. 2016. *Cultural heritage impact assessment for the development of the proposed Kagiso Solar power plant on the remaining extent of the farm Kameelaar no.315 Registration Division Kuruman, Northern Cape Province.*

Van Vollenhoven, A.C. 2012. *A report on a heritage impact assessment for the proposed Main Street 778 (Pty) Ltd mining right application close to Hotazel, Northern Cape Province*. Pretoria: Unpublished report.

Webley, L & Halkett, D. 2008. *Phase 1 Heritage Impact Assessment: proposed prospecting on the Farm Adams 328 and Erin 316 Kuruman. Ga-segonyana Municipality. in the Northern Cape. Report prepared for Zama Mining Resources (Pty) Ltd. Archaeology Contracts Office, Department of Archaeology, University of Cape Town*.

Wilkins, J, and Chazan, M. 2012. *Blade production - 500 thousand years ago at Kathu Pan 1, South Africa: support for a multiple origins hypothesis for early Middle Pleistocene blade technologies. Journal of Archaeological Science* 39: 1883-1900.

APPENDIX 1: CHANCE FIND PROCEDURE FOR THE PROSPECTING RIGHT APPLICATION ON THE FARMS CHESTER 199, CHAKANA 200 AND GAMAHAUDI 122 IN THE NORTHERN CAPE PROVINCE.

November 2020

ACRONYMS

BGG	Burial Grounds and Graves
CFPs	Chance Find Procedures
ECO	Environmental Control Officer
HIA	Heritage Impact Assessment
ICOMOS	International Council on Monuments and Sites
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
SAHRA	South African Heritage Resources Authority
SAPS	South African Police Service
UNESCO	United Nations Educational, Scientific and Cultural Organisation

CHANCE FIND PROCEDURE

Introduction

An Archaeological Chance Find Procedure (CFP) is a tool for the protection of previously unidentified cultural heritage resources during construction and mining. The main purpose of a CFP is to raise awareness of all construction, mine workers and management on site regarding the potential for accidental discovery of cultural heritage resources and establish a procedure for the protection of these resources. Chance Finds are defined as potential cultural heritage (or paleontological) objects, features, or sites that are identified outside of or after Heritage Impact studies, normally as a result of construction monitoring. Chance Finds may be made by any member of the project team who may not necessarily be an archaeologist or even visitors. Appropriate application of a CFP on development projects has led to discovery of cultural heritage resources that were not identified during archaeological and heritage impact assessments. As such, it is considered to be a valuable instrument when properly implemented. For the CFP to be effective, the site manager must ensure that all personnel on the proposed mining development site understand the CFP and the importance of adhering to it if cultural heritage resources are encountered. In addition, training or induction on cultural heritage resources that might potentially be found on site should be provided. In short, the Chance find procedure details the necessary steps to be taken if any culturally significant artefacts are found during construction.

Definitions

In short the term 'heritage resource' includes structures, archaeology, meteors, and public monuments as defined in the South African National Heritage Resources Act (Act No. 25 of 1999) (NHRA) Sections 34, 35, and 37. Procedures specific to burial grounds and graves (BGG) as defined under NHRA Section 36 will be discussed separately as this require the implementation of separate criteria for CFPs.

Background

The prospecting right application site is located on the farms: farms Chester 199, Chakana 200 and Gamahaoudi 122 in the Northern Cape Province, the development site is subject to heritage survey and assessment at planning stage in accordance with the NHRA. These surveys are based on surface indications alone and it is therefore possible that sites or significant archaeological remains can be missed during surveys because they occur beneath the surface. These are often accidentally exposed in the course of construction or any associated construction work and hence the need for a Chance Find Procedure to deal with accidental finds. In this case an extensive Archaeological Impact Assessment was completed by T. Mlilo (2020) on the prospecting right application site. The

AIA/HIA conducted was very comprehensive covering the entire site. The current study (Mlilo 2020) recorded scatters of potsherds which further documentation should the project proceed to mining stage.

Purpose

The purpose of this Chance Find Procedure is to ensure the protection of previously unrecorded heritage resources along the proposed project site. This Chance Find Procedure intends to provide the applicant and contractors with appropriate response in accordance with the NHRA and international best practice. The aim of this CFP is to avoid or reduce project risks that may occur as a result of accidental finds whilst considering international best practice. In addition, this document seeks to address the probability of archaeological remains finds and features becoming accidentally exposed during digging of foundations and movement of construction equipment. The proposed prospecting activities have the potential to cause severe impacts on significant tangible and intangible cultural heritage resources buried beneath the surface or concealed by tall grass cover. Integrated Specialist Services and Environmental Consultants developed this Chance Find Procedure to define the process which govern the management of Chance Finds during construction. This ensures that appropriate treatment of chance finds while also minimizing disruption of the construction schedule. It also enables compliance with the NHRA and all relevant regulations. Archaeological Chance Find Procedures are to promote preservation of archaeological remains while minimizing disruption of construction scheduling. It is recommended that due to the low to moderate archaeological potential of the project area, all site personnel and contractors be informed of the Archaeological Chance Find procedure and have access to a copy while on site. This document has been prepared to define the avoidance, minimization and mitigation measures necessary to ensure that negative impacts to known and unknown archaeological remains as a result of project activities and are prevented or where this is not possible, reduced to as low as reasonably practical during construction and mining.

Thus, this Chance Finds Procedure covers the actions to be taken from the discovering of a heritage site or item to its investigation and assessment by a professional archaeologist or other appropriately qualified person to its rescue or salvage.

CHANCE FIND PROCEDURE

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction/clearance activities in the vicinity of the accidental find/feature/site must cease immediately to avoid further damage to the find site.

- Briefly note the type of archaeological materials you think you have encountered, and their location, including, if possible, the depth below surface of the find
- Report your discovery to your supervisor or if they are unavailable, report to the project ECO who will provide further instructions.
- If the supervisor is not available, notify the Environmental Control Officer immediately. The Environmental Control Officer will then report the find to the Site Manager who will promptly notify the project archaeologist and SAHRA.
- Delineate the discovered find/ feature/ site and provide 25m buffer zone from all sides of the find.
- Record the find GPS location, if able.
- All remains are to be stabilised *in situ*.
- Secure the area to prevent any damage or loss of removable objects.
- Photograph the exposed materials, preferably with a scale (a yellow plastic field binder will suffice).
- The project archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.

- **Finds rescue strategy:** All investigation of archaeological soils will be undertaken by hand, all finds, remains and samples will be kept and submitted to a Museum as required by the heritage legislation. In the event that any artefacts need to be conserved, the relevant permit will be sought from the SAHRA.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the SAHRA Burial Ground Unit will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an archaeological will be available to examine the remains.
- The project archaeologist will complete a report on the findings as part of the permit application process.
- Once authorisation has been given by SAHRA, the Applicant will be informed when mining activities can resume.

Management of chance finds

Should the Heritage specialist conclude that the find is a heritage resource protected in terms of the NRHA (1999) Sections 34, 36, 37 and NHRA (1999) Regulations (Regulation 38, 39, 40), ISS will notify SAHRA and/or PHRA on behalf of the applicant. SAHRA/PHRA may require that a search and rescue exercise be conducted in terms of

NHRA Section 38, this may include rescue excavations, for which ISS will submit a rescue permit application having fulfilled all requirements of the permit application process.

In the event that human remains are accidentally exposed, SAHRA Burial Ground Unit or ISS Heritage Specialist must immediately be notified of the discovery in order to take the required further steps:

- a. Heritage Specialist to inspect, evaluate and document the exposed burial or skeletal remains and determine further action in consultation with the SAPS and Traditional authorities:
- b. Heritage specialist will investigate the age of the accidental exposure in order to determine whether the find is a burial older than 60 years under the jurisdiction of SAHRA or that the exposed burial is younger than 60 years under the jurisdiction of the Department of Health in terms of the Human Tissue Act.
- c. The local SAPS will be notified to inspect the accidental exposure in order to determine where the site is a scene of crime or not.
- d. Having inspected and evaluated the accidental exposure of human remains, the project Archaeologist will then track and consult the potential descendants or custodians of the affected burial.
- e. The project archaeologist will consult with the traditional authorities, local municipality, and SAPS to seek endorsement for the rescue of the remains. Consultation must be done in terms of NHRA (1999) Regulations 39, 40, 42.
- f. Having obtained consent from affected families and stakeholders, the project archaeologist will then compile a Rescue Permit application and submit to SAHRA Burial Ground and Graves Unit.
- g. As soon as the project archaeologist receives the rescue permit from SAHRA he will in collaboration with the company/contractor arrange for the relocation in terms of logistics and appointing of an experienced undertaker to conduct the relocation process.
- h. The rescue process will be done under the supervision of the archaeologist, the site representative and affected family members. Retrieval of the remains shall be undertaken in such a manner as to reveal the stratigraphic and spatial relationship of the human skeletal remains with other archaeological features in the excavation (e.g., grave goods, hearths, burial pits, etc.). A catalogue and bagging system shall be utilised that will allow ready reassembly and relational analysis of all elements in a laboratory. The remains will not be touched with the naked hand; all Contractor personnel working on

the excavation must wear clean cotton or non-powdered latex gloves when handling remains in order to minimise contamination of the remains with modern human DNA. The project archaeologist will document the process from exhumation to reburial.

- i. Having fulfilled the requirements of the rescue/burial permit, the project archaeologist will compile a mitigation report which details the whole process from discovery to relocation. The report will be submitted to SAHRA and to the company.

Note that the relocation process will be informed by SAHRA Regulations and the wishes of the descendants of the affected burial.

Appendix 1: Heritage Management Plan Input into the Prospecting Right Application EMP

Objectiv	<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-Construction 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.						

Operational Phase	
	Same as prospecting phase.

Appendix 2: 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>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 	<ul style="list-style-type: none"> • Contractor / • Project Manager • Archaeologist • Project EO 	Fine and or imprisonment under the 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 commence within the farm.</p>

		Loss of intangible heritage value due to change in land use	possible relocation of affected graves accidentally encountered during construction work.			
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Appendix 3: 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.