



TITLE: Heritage Scoping Study for the Proposed Prospecting Rights Application on Farms Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324, and Stillewoning 703, Free State Province, South Africa

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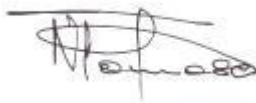
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DECLARATION OF INDEPENDENCE

This report has been compiled by Nkosinathi Tomose for NGT Consulting (Pty) Ltd. The views expressed in this report are entirely those of the author and no other interest was displayed during the decision-making process for the project.

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EXECUTIVE SUMMARY

NGT Holdings (Pty) Ltd was contracted by Muthetsheseli Projects to conduct a Heritage Specialist Scoping Assessment for the prospecting rights application on farms Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324, and Stillewoning 703 as part of specialist input into the Basic Assessment report (BAR) required to fulfill the prospecting rights application and the environmental management process which forms part of the rights application process. The prospecting rights application is for a company known as Sunshine Mineral Reserves (Pty) Ltd. The prospecting rights application is in terms of Section 22 of the Mining and Petroleum Resources Development Act, Act 28 of 2002. The heritage specialist scoping assessment is in terms of Section 38 (1) of the National Heritage Resources Act, No. 25 of 1999 and is conducted by NGT Consulting – a subsidiary of NGT Holdings (Pty) Ltd responsible for the implementation of NGT Holdings projects.

Nkosinathi Tomose, principal archaeologist and heritage consultant from NGT Consulting, conducted the desktop scoping study. This study assesses a range of all manmade or human influenced/changed resources within farms Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324, and Stillewoning 703. Based on the desktop survey of the proposed prospecting rights area the following conclusions and recommendations are made about the project.

Conclusions:

- It is concluded that the current study (inclusive of Palaeontology desktop study) is only a desktop scoping study and not a heritage impact assessment study.
- It is development to form part of a BAR (Basic Assessment Report) for application of prospective rights in the affected properties. The proposed prospecting rights are none invasive and based on historic database.
- Therefore no survey of the affected properties has taken place; a site orientation of the project area is to be conducted on Wednesday the 7th December 2016 to take images for the attention of SAHRA during SAHRIS report submission (Please note! No contact will be made with property owners or detail survey of affected properties will take place)
- Based on the available database of the affected properties (i.e. the four farms), the affected properties have the potential to yield archaeological resources in form of Stone Age materials along the river banks, Iron Age and historic archaeology settlements such as ruins and stonewalling are also likely to be found along the flood plans and on the flat plains.

- These properties also have the potential to yield burial ground and graves in form of graveyards and cemeteries associated with historic and modern settlements in the area.
- Rock Art resources are more likely to be found in rock shelters along major rivers that cut through the study area.
- In total over 32 built environment and landscape features have been identified during the scoping study and they present social and heritage risks to future mining activities; however, such risk can be mitigated.
- Based on the type of prospecting activities proposed for this project i.e. none invasive based on historic database – it is concluded that the current scoping study (inclusive of PDS) is sufficient for current DMR application.

Recommendations

- It is recommended that a detailed heritage impact assessment (HIA) be conducted once this report has been reviewed by the SAHRA and the FS-PHRA and prior to conducting mining activities on the affected properties.
- The HIA should consider the newly proposed SAHRA Minimum Standards for conducting an HIA
- The HIA should include a detailed survey of the affected properties in search of archaeological and heritage resources that are likely to be affected by future mining activities on site
- The survey should focus on those areas that are more likely to yield heritage resources.
- The HIA should record and document all the identified resources must be undertaken using the necessary tools and equipment and impact evaluation and assessment process.
- The identified heritage resources should be assessed in terms of their heritage significance using the system of field grading.
- Levels of impacts on the identified resources as the result of mining activities should be assessed or evaluated.
- The HIA should make recommendations for mitigating / managing impacts on affected resources, individuals and communities.

- Based on the nature of proposed prospecting activities, none invasive, it s recommended that SAHRA and DMR should allow Sunshine to proceed with the project

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ABBREVIATIONS

Acronyms	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
BAR	Basic Assessment Report
CEMPr	Construction Environmental Management Programme
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DoE	Department of Energy
EIA Practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
FS-PHRA	Free State Provincial Heritage Resources Agency
GIS	Geographic Information System
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
K.y.a	Thousand years ago
LSA	Late Stone Age
LIA	Late Iron Age
MIA	Middle Iron Age
MSA	Middle Stone Age
M.y.a	Million years ago
NHRA	National Heritage Resources Act
NEMA	National Environmental Management Act
PSSA	Paleontological Society of South Africa
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency

TERMS & DEFINITION

Archaeological resources

This includes:

- Material remains resulting from human activities which 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.
- Rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation.
- Wrecks, being any vessel or aircraft, or any part thereof which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic as defined in the Maritimes Zones Act, and any cargo, debris or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.
- Features, structures and artefacts associated with military history which are older than 75 years and the site on which they are found.

Cultural significance

This means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Development

This means any physical intervention, excavation, or action, other than those caused by natural forces, which may, in the opinion of the heritage authority, in any way result in the change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- i. Construction, alteration, demolition, removal or change in use of a place or a structure at a place.
- ii. Carrying out any works on or over or under a place.
- iii. Subdivision or consolidation of land comprising a place, including the structures or airspace of a place.
- iv. Constructing or putting up for display signs or boards.
- v. Any change to the natural or existing condition or topography of land.

- vi. Any removal or destruction of trees, or removal of vegetation or topsoil.

Heritage resources

This means any place or object of cultural significance.

1. INTRODUCTION

1.1. Project Background

Sunshine Mineral Reserves (Pty) Ltd (hereafter referred to as Sunshine) is applying for prospecting rights, in terms of Mineral and Petroleum Resources Act (MPRDA, 2002), to evaluate the economical potential of the minerals on the following farms: Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324 and Stillewoning 703 (*Figure 1*).

1.2. Method Applied in Prospecting

Sunshine has not planned any invasive exploration on all four farms applied for in the Prospecting Right application, except for Non-invasive, on-foot field mapping will be conducted, for the reason being extensive invasive exploration was executed in the past by various companies over a long period of time, and that Sunshine will purchase as much data as possible from companies who hold historical data like borehole logs, borehole core, seismic data, geophysical data, reports and resource/reserve calculations. Over 50 surface boreholes have been drilled in the past, over an area that covers the four farms in this Prospecting Right application and including a 5 kilometre data buffer zone that surrounds these four farms. All these borehole cores have been extensively studied and reported on in the past. Apart from that, seismic surveys have also been executed in the area.

1.3. Project Location

The proposed development area is situated between the R30 and R75 roads (*Figure 2*). The town of Welkom is situated 8.2 km to the north and the town of Virginia can be found 6.1 km to the east (*Figure 2*). The town of Theunissen is located approximately 30 km to the south. The proposed development area is also intersected by the Sand River from east to west, and includes the farms of Adamsons Vley 655, Jonkers Rust 72, Du Preez Leger 324 and Stillewoning 703 (*Figure 1*).

1.4. Legislation Triggered and Terms of Reference for the Appointment of Archaeologist and Heritage Specialist

Muthetshelesi Projects is the lead Environmental Assessment Practitioner (EAP) managing the BAR process in the application for prospecting rights. NGT Holdings is appointed as an independent and lead CRM firm to conduct a HSS (heritage scoping study) (inclusive of Palaeontological desktop study) for the proposed development. In turn it appointed its subsidiary, NGT Consulting responsible for the implementation of NGT Holdings projects to conduct the work. Nkosinathi Tomose, Principal Consultant for NGT Consulting, conducted the current desktop study for the proposed prospecting rights application.

The appointment of NGT Holdings (and its subsidiary thereof) as lead and independent Cultural Resources Management (CRM) company is in terms of Section 38 of the NHRA, No. 25 of 1999, the NEMA, No.107 of 1998 (as amended in September 2014 & the applicable 2010 Regulations). The prospecting rights application is in terms of Section 22 of the Mineral and Petroleum Resources Development Act, Act 28 of 2002.

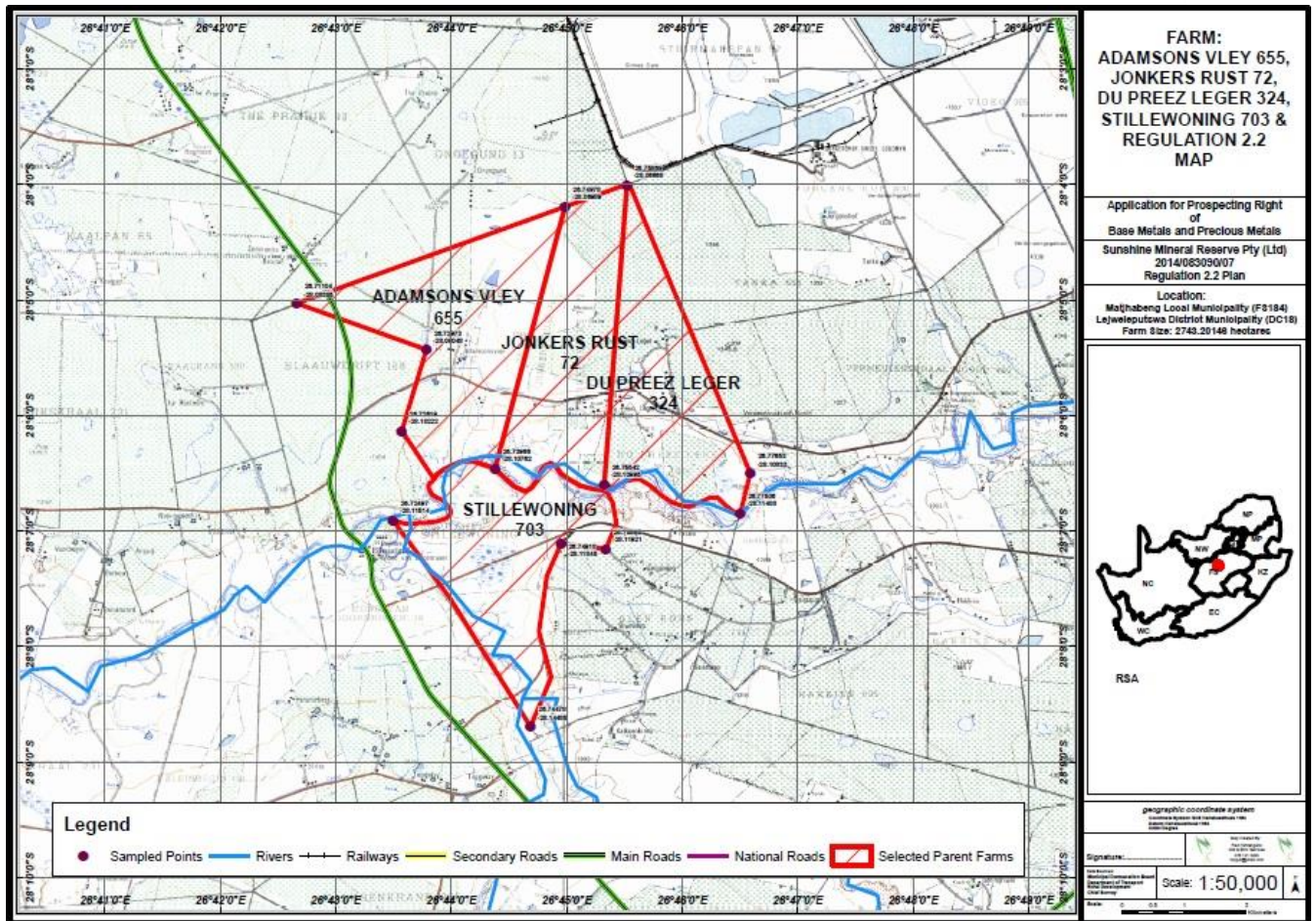


Figure 1: A GIS map displaying the location and the farms for the proposed development

1. BACKGROUND OF THE STUDY AREA

South Africa is rich in diverse forms and types of heritage resources, ranging from natural to cultural heritage. The natural heritage includes among other things: Geological, Palaeontological, and the various plant and animal species that define the country. The cultural heritage, which dates as far back as 2.5 million years ago (m.y.a), includes - the different periods of Stone Age Archaeology, the Iron Age Archaeology, Historical and Industrial Archaeology, as well as the “Political/Historic” geographies of South Africa (reference - Tomose, 2013 a, b, c, d). This Heritage Scoping Study (HSS) assesses the range of all the manmade or human influenced resources within proposed development area.

1.4. Background Information Study

2.1.1. Stone Age

The Stone Age is primarily characterised by the creation and use of stone tools within hunter-gatherer societies. These would include hand-axes, flakes and a variety of other stone tools for grinding and scraping. These stone tools can be identified as far back as 2 million years ago. The Stone Age is divided into 3 distinct periods: Early Stone Age (ESA), Middle Stone Age (MSA), and Late Stone Age (LSA).

The Early Stone Age (ESA) of Southern Africa is associated with the Homo erectus hominid and the hand axe stone tool. Hand axes found in Southern Africa are part of the Acheulean industry. Hand axes were created from single cores and can be described as tough, sharp, heavy tools, chipped on both sides to form a deliberate point (Shillington, 2005). These were used for the butchering of animals, scraping of hides and the digging for plant foods.

The Middle Stone Age (MSA) of Southern Africa is characterised by the use of smaller stone tools and their use by Homo sapiens about 200 thousand years ago (kya). Stone tools of the MSA were created by striking off stone flakes from a prepared core, and these flakes were then used as tools instead of the much larger hand axes (Shillington, 2005). Evidence is also found where these MSA flakes were retouched to keep their cutting edge. Different shapes of MSA tools were also created, such as blades. These elongated flakes could then be hafted onto bone or wood.

The Late Stone Age (LSA) is characterised by the use of much smaller and finely worked stone tools, known as microliths. These tools were used by the Homo sapiens sapiens (modern humans) hominid that started appearing about 120 kya. These smaller microliths could be transported much easier and were also hafted onto wooden implements (Shillington, 2005). The LSA is also characterised by the manufacture of pottery as well as the domestication of animals by some societies such as the Khoi.

2.1.2. Rock Art

Rock art is characterised by paintings and engravings upon stone surfaces from about 25 kya to present. Rock art sites can be found in caves, underneath rock overhangs and boulders. Rock art sites

are common all over South Africa and are mostly associated with the San people. There are, however, many rock art sites that were not created by the San people, but by the Khoi, Bantu, Korana and the European settlers of Southern Africa. Images would depict events within these societies, such as conflict, floods or droughts. Their beliefs were also depicted as well as their interactions with the supernatural world (Ouzman, Seeing Is Deceiving: Rock Art and the Non-Visual, 2001). Rock art paintings were created using ochre, charcoal, ostrich eggshell and raptor faeces.

2.1.3. Historical Archaeology

The Historical period in Southern Africa is characterised by the arrival of European settlers. The first Europeans to settle South Africa permanently were the Dutch settlers of the Dutch East India Company in 1652 and they settled what was to become the Cape Colony (Ross, 1999). In the 1690's many settler farmers, most of which had little capital, began to seek land more into the interior of South Africa. Many moved eastwards towards the Great Fish River. These settlers became known as *trekboers*. Because they lived so far from the nearest settlements, they had to learn to be self-reliant and lived as semi-nomadic lifestyle, moving with the seasons for their livestock. A movement known as the Great Trek left the eastern frontier of the Cape Colony in 1838, travelling northward in search of political freedom from the British controlled Cape Colony (Ross, 1999). The participants of the Great Trek were known as the *Voortrekkers*. They crossed the Orange River and founded numerous settlements in what is today the Free State. The *Voortrekkers* weren't the first to cross the Orange River, many *Trekboers*, game hunters, escaped slaves and the Korana have passed through the area.

2.1.4. History of Welkom

Welkom is considered to be South Africa's youngest city and is the second largest town in the Free State. It was proclaimed by William Backhouse, a city planning consultant for Anglo-American, in 1947. The city was founded for the rich gold and uranium deposits discovered in the area (Erasmus B. , 2004). Notable sites in the area include:

- The Aandenk Monument – celebrating the discovery of gold in the area
- An Afrikaans language monument
- The Joanne Pim Monument
- A second world war monument
- A Voortrekker Memorial

- A dog monument
- The MOTH memorial
- The Gold Museum – offers a complete history of the discovery of Gold in the area
- The Welkom Museum – offers a complete history of Welkom
- A Local Apartheid Memorial
- The Sand River Convention Memorial – located on the banks of the Sand River. This is where the independence *Zuid-Afrikaanshe Republiek* (Transvaal) was recognised by the British Empire in 1852 (Ross, 1999).

1.5. Description of the affected environment

The proposed prospecting rights application generally rugged area defined by rivers that crisscross it. The Sand River separates Farm Stillewoning 703 (south) from Farms Jonkers Rust 72, Du Preez Leger 324, Adamsons Vley 655 (north) and is a major natural land feature in the area. Doorin River is major natural feature that cuts through Farm Stillewoning 703 from the south to north where it joins the Sand River. A major canal cuts through Farms Jonkers Rust 72, Du Preez Leger, Adamsons Vley 655 north of the Sand River. A major wetland is found on Farm Stillewoning 703. The rivers and gullies that define their valleys create a rugged landscape along the two major rivers and the smaller tributaries that define the affected landscape. Other than the rugged valleys, the area is generally flat and characterised by agricultural activities.

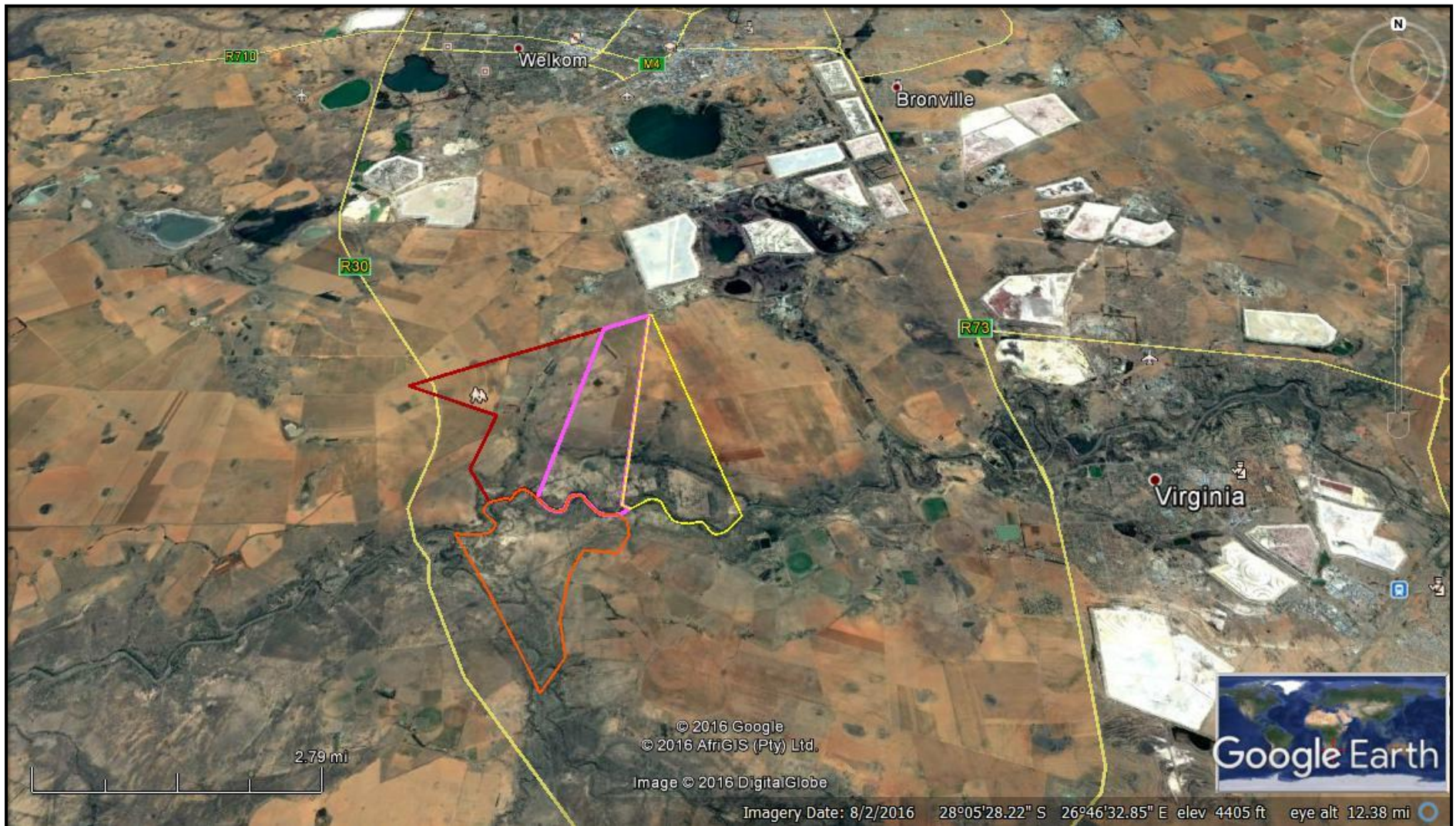


Figure 2- Google Earth aerial view of the study area

1.6. Description of proposed activities: Proposed Infrastructure

Table 1: List of Proposed Activities

Activity 1	<ul style="list-style-type: none"> Prospecting Rights Application
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1.7. Needs and Desirability

Table 2: List of activities in-line with the project scope

Activity 1	<ul style="list-style-type: none"> Desktop study of the heritage value and integrity of the area under consideration and its surrounding with a particular focus on resources within the proposed mining area as marked in Figure 1. Scoping and documentation and recording of cultural resources within the proposed mining area.
Activity 2	<ul style="list-style-type: none"> The mapping, assessment and evaluation of the heritage value and integrity of the identified heritage resources and Go Area vs. No Go Area.
Activity 3	<ul style="list-style-type: none"> Developing of plan of study for the BAR phase. Making recommendations to SAHRA and provincial heritage resources authority (FS-PHRA).

2. METHODOLOGY

This chapter outlines the methodologies used in conducting this heritage scoping study for the proposed development area. The study area is located Matjhabeng Local Municipality, Free State Province. This is done in accordance to the Terms of Reference provided by the client for the completion of this study. However, some areas of the report follow minimum standards for completion of professional HIAs (**adopted for the scoping phase**) as stipulated in SAHRA minimum standard (2012) such as detailed account to the archaeological and historical background of the study area or region affected.

2.4. Step I – Literature Review (Desktop Phase):

- Sources used in this study included, but not limited to, published academic papers, books and internet publications.
- The use of archival maps – three historical maps showing the proposed area of development and its surroundings were assessed to aid information about the proposed area of development and its surroundings.
- The above also included a review and assessment of relevant environmental and heritage legislations such as the NEMA (together with the 2010 EIA Regulations) and the NHRA.

2.5. Step II – Physical Survey:

The objectives of physical surveys for heritage studies seek to address the following areas of concern:

- To conduct an onsite verification survey for sites that have been spotted at the scoping through desktop search.
- To identify all objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the proposed development footprint.

No physical survey took place as part of this study

- The study relied on published records and HIAs conducted in the Free State province and for location of communities within the project footprint was based on Google Earth Spotting. Furthermore, the following technological tools and platforms were deemed important for documenting and recording located and/or identified sites:
- DELL aided with Garmin Basecamp Software, Google Earth – to plot the proposed development area.
- Quantum GIS Wroclaw (1.7.4) was used to map communities spotted in the proposed development area against the proposed mine development infrastructures.

2.6. Step III – Data Consolidation and Report Writing:

All the archaeological and heritage data as well as the data captured on the development area by means of Google Earth spotting is used as a baseline for this desktop heritage study. This data is also used to develop assessment for current and future impacts within the development footprint:

- Assessment of the significance of the cultural resources in terms of their archaeological, built environment and landscape, historical, scientific, social, religious, aesthetic and tourism value"
- Description of possible impact of the proposed development on these cultural environment and remains, according to a set of standard and conventions for the management of the cultural environment;
- Proposal of suitable mitigation measures to minimize possible negative impacts on the cultural environment and resources that may result from the proposed mining activities;
- Review of applicable legislative requirements – *as discussed in section 1.1 above under Terms of Reference for the Appointment of Heritage Specialist.*
- Highlighting of assumptions, exclusions and key uncertainties". *Chapter 4 (below) of this report addresses this concern.*
- The final step involved the consolidation of the data collected using the various sources as described above. This involved the manipulation of data through Quantum GIS 1.7.4 Wrocław.
- Assessing the significance and potential impact of the identified sites (**communities in the case**).
- Discussing the findings and making recommendation on the management and mitigation measures of the identified cultural environmental features and the potential heritage resources that might encountered within and around these cultural environment areas such as local farmsteads and villages.
- The impacts of heritage resources such as burial ground and graves predicted to occur around farmsteads and local communities on the proposed prospecting rights footprint.

2.7. Assessment of Site Significance in Terms of Heritage Resource Management Methodologies

The significance of heritage sites was based on four 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)
 - Low - <10/50m²
 - Medium - 10-50/50m²
 - High - >50/50m²
- Uniqueness and
- Potential to answer present research questions.

Management actions and recommended mitigation, which will result in a reduction in the impact on the sites, will be expressed as follows:

- A - No further action necessary;
- B - Mapping of the site and controlled sampling required;
- C - No-go or relocate pylon position
- D - Preserve site, or extensive data collection and mapping of the site; and
- E - Preserve site
- F - Impacts on these sites by the development will be evaluated as follows:

Measure of Heritage Site Significance

The following site significance classification minimum standards as prescribed by SAHRA (2006) and approved by ASAPA for the SADC region were used for the purpose of this report.

Table 3: Site significance classification standards as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
Notional Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site Nomination
Local Significance (LS)	Grade 3A	High Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	Grade 3C	High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)	Grade 3D	Medium Significance	Recording before destruction
Generally Protected C (GP.C)	Grade 3E	Low Significance	Destruction

2.8. Methodology for Impact Assessment in terms of Environmental Impact Assessment Methodologies including Measures for Environmental Management Plan Consideration

The determination of the effects of environmental impact on an environmental parameter is determined through a systematic analysis of the various components of the impact. This is undertaken using information that is available to the environmental practitioner. The impact evaluation of predicted impacts was undertaken through an assessment of the significance of the impacts. This is in line with specialist requirements as required by the client. For example, the request that:

The impact methodology [should] concentrate on addressing key issues with a potential to impact on the proposed development.

In order to address the client a request, the current methodology was employed in the report thus results in a circular route, which allows for the evaluation of the efficiency of the process itself. The assessment of actions in each phase [that should] be conducted in the following order:

- Assessment of key issues;
- Analysis of the activities relating to the proposed development;

- Assessment of the potential impacts arising from the activities, without mitigation, and
- Investigation of the relevant mitigation measures for both the construction and operational phases.

The following Assessment Criteria is Used for Impact Assessment

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

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

Probability: describes the likelihood of the impact actually occurring

- **Improbable:** the possibility of the impact occurring is very low due to the circumstances, design or experience.
- **Probable:** there is a probability that the impact will occur to the extent that provision must be made therefore.
- **Highly Probable:** it is most likely that the impact will occur at some stage of the development.
- **Definite:** the impact will take place regardless of any prevention plans and there can only be relied on mitigatory measures or contingency plans to contain the effect.

Duration: the lifetime of the impact

- **Short Term:** the impact will either disappear with mitigation or will be mitigated through natural processes in a time span shorter than any of the phases.
- **Medium Term:** the impact will last up to the end of the phases, where after it will be negated.
- **Long Term:** the impact will last for the entire operational phase of the project but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent:** the impact is non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

Scale: the physical and spatial size of the impact

- **Local:** the impacted area extends only as far as the activity, e.g. footprint
- **Site:** the impact could affect the whole or measurable portion of the above mentioned properties.
- **Regional:** the impact could affect the area including the neighbouring residential areas.

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

- **Low:** the impact alters the affected environment in such a way that natural processes are not affected.
- **Medium:** the affected environment is altered, but functions and processes continue in a modified way.
- **High:** function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

Significance: This is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.

- **Negligible:** the impact is non-existent or unsubstantial and is of no or little importance to any stakeholder and can be ignored.
- **Low:** the impact is limited in extent, has low to medium intensity; whatever its probability of occurrence is, the impact will not have a material effect on the decision and is likely to require management intervention with increased costs.
- **Moderate:** the impact is of importance to one or more stakeholders, and its intensity will be medium or high; therefore, the impact may materially affect the decision, and management intervention will be required.
- **High:** The impact could render development options controversial or the project unacceptable if it cannot be reduced to acceptable levels; and/or the cost of management intervention will be a significant factor in mitigation.

The significance is calculated by combining the criteria in the following formula:

Sum (Duration, Scale, Magnitude) x Probability (*Table -4*)

Table 4: The significance weightings for each potential impact are as follows:

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

The significance of each activity was rated without mitigation measures (WOM) and with mitigation (WM) measures for both construction, operational and closure phases of the proposed development. To address the question of Heritage Management Plan the following table is used for Measures to be included in the EMP. This table is relevant in that it addresses key issues at the various stages of the project by also addresses how some of the key concerns that develop from a heritage point of view can be mitigated (Table 5).

Table 5: Measures for inclusion in the draft Environmental Management Plan:

OBJECTIVE: Description of the objective, which is necessary in order to meet the overall goals; this take into account the findings of the environmental impact assessment specialist studies.

Project component/s	List of project components affecting the objective	
Potential Impact	Brief description of potential environmental impact if objective is not met	
Activity/risk source	Description of activities which could impact on achieving objective	
Mitigation: Target/Objective	Description of the target; include quantitative measures and/or dates of completion	
Mitigation: Action/control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above	Who is responsible for the measures	Time periods for implementation of measures
Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management plan.	
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting	

3. ASSUMPTIONS, EXCLUSIONS AND UNCERTAINTIES

The assumptions, exclusions and uncertainties that exist in terms of the present study are discussed in the following sub-sections.

3.4. Assumptions

The current study is a Heritage Scoping study and as such, a historical and archival desktop study were undertaken to develop a baseline database for the study area. This process involves searching for potential heritage and archaeological site that are known to occur in the region and which may be identified on site based on what is known about the region in which the site is located. Using Google Earth and cadastral database to identify features associated with the cultural environment that may yield tangible heritage resources within the development footprint during the physical survey phase of the project.

The assumption is that a preliminary Scoping Phase survey would have taken place and this would have also necessitated a heritage social consultative process with some of the Interested and Affected Parties (I&AP) to ascertain known archaeological and heritage sites or resources in their properties

such as presence or existence of graves and cemeteries, historic built environment and landscape features etc.

3.5. Exclusions

The following exclusions or limitations have direct consequence to the study and its results:

- There was no deeds search for the proposed development area development footprint from a heritage resources management point of view. Normally we undertake such search in cases where the developer is conducting initial project viability studies. In the case of the proposed development area, other processes have been initiated to deal with among other issues such as land claims etc. There was therefore no need to conduct a deeds search for the property.
- There was no scoping site survey to orientate the archaeologist and heritage consultant of the terrain in which the proposed development is to take place and the study is purely desktop based. The preliminary scoping survey often assist to channel the research process in a manner that would lead to detailed background search of features in the landscape that have been spotted during the survey.

3.6. Uncertainties

Based on the fact that the study is purely desktop with no physical site orientation of the project area – there are many uncertainties about what the actual environment looks like in reality. What type of communities are there and how do they define their cultural environmental space and how this may influence among other things the burial processes and based on this how to use such clues in spotting the area under consideration for heritage sites such as burial grounds and graves, initiation sites and places of prayer and worship.

4. FINDINGS

4.4. Cadastral Search

The cadastral search show a number of built environment and landscape features in all the affected farms. For example, ruins are recorded on Farm Stillewoning 703 which is situated south of the Sand River (*Figure 5 – purple arrow. See also Figure 6*). North of the Sand River on Farms Jonkers Rust 72 and Du Preez Leger 324 over 20 built environment features have been recorded in form of homesteads and kraals (*Figure 3- Purple triangle*). These features are located north and south of the canal that

cuts across the two farms. On Farms Adamsons Vley 655 over 12 built environment features have been recorded and they are mostly homesteads (Figure 3).

In **conclusion**, the cadastral database show the there is over 32 built environment features located in the four affected farms. Based on experience and knowledge gained on similar projects most of the farming community homestead and kraals contain burial grounds and graves and the likelihood of finding such is high. However, we can only infer such at this stage of the project.

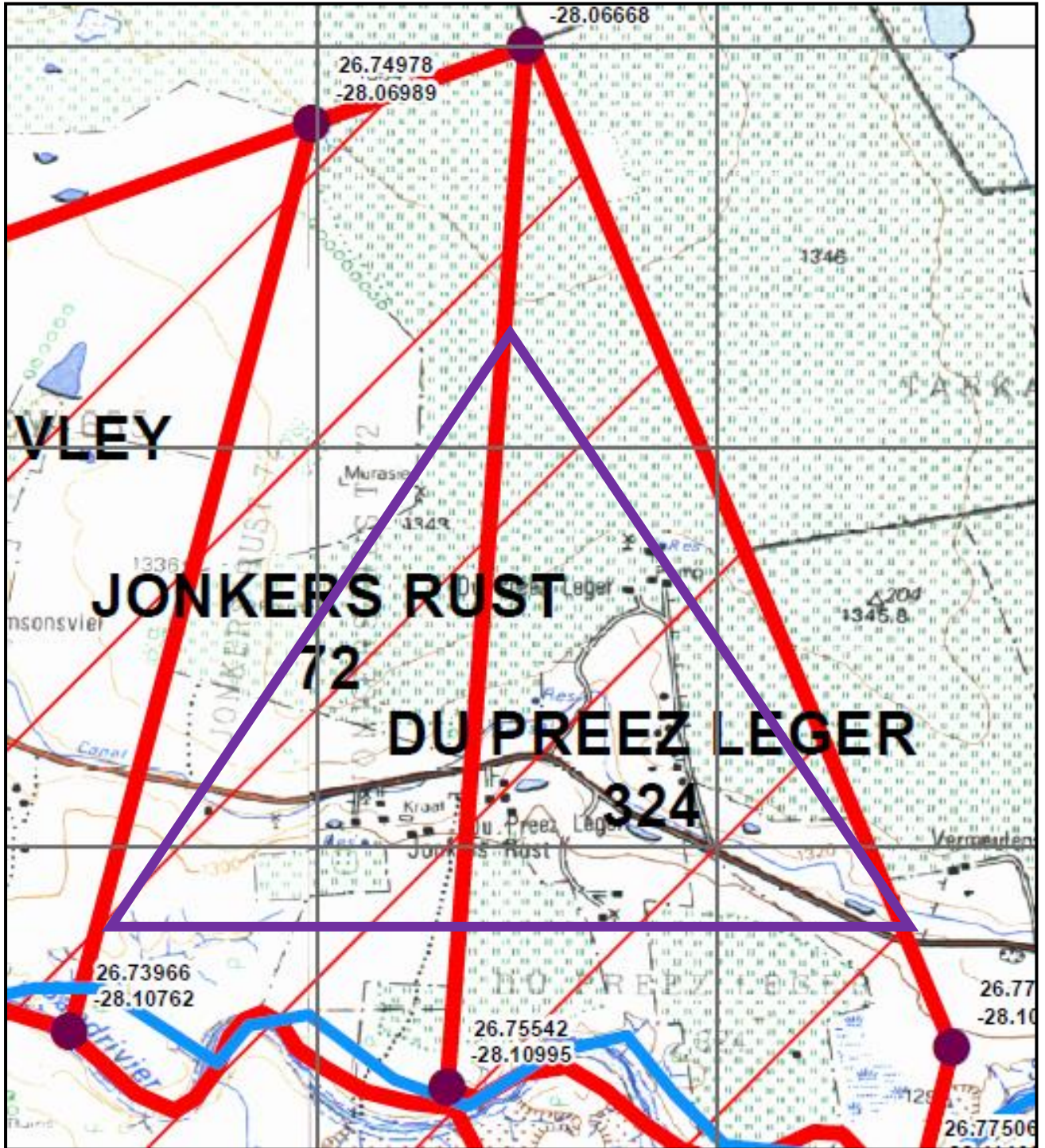


Figure 3- Built environment features which include homesteads and kraals on Farms Jonkers Rust 72 and Du Preez Leger 324 (Purple triangle)

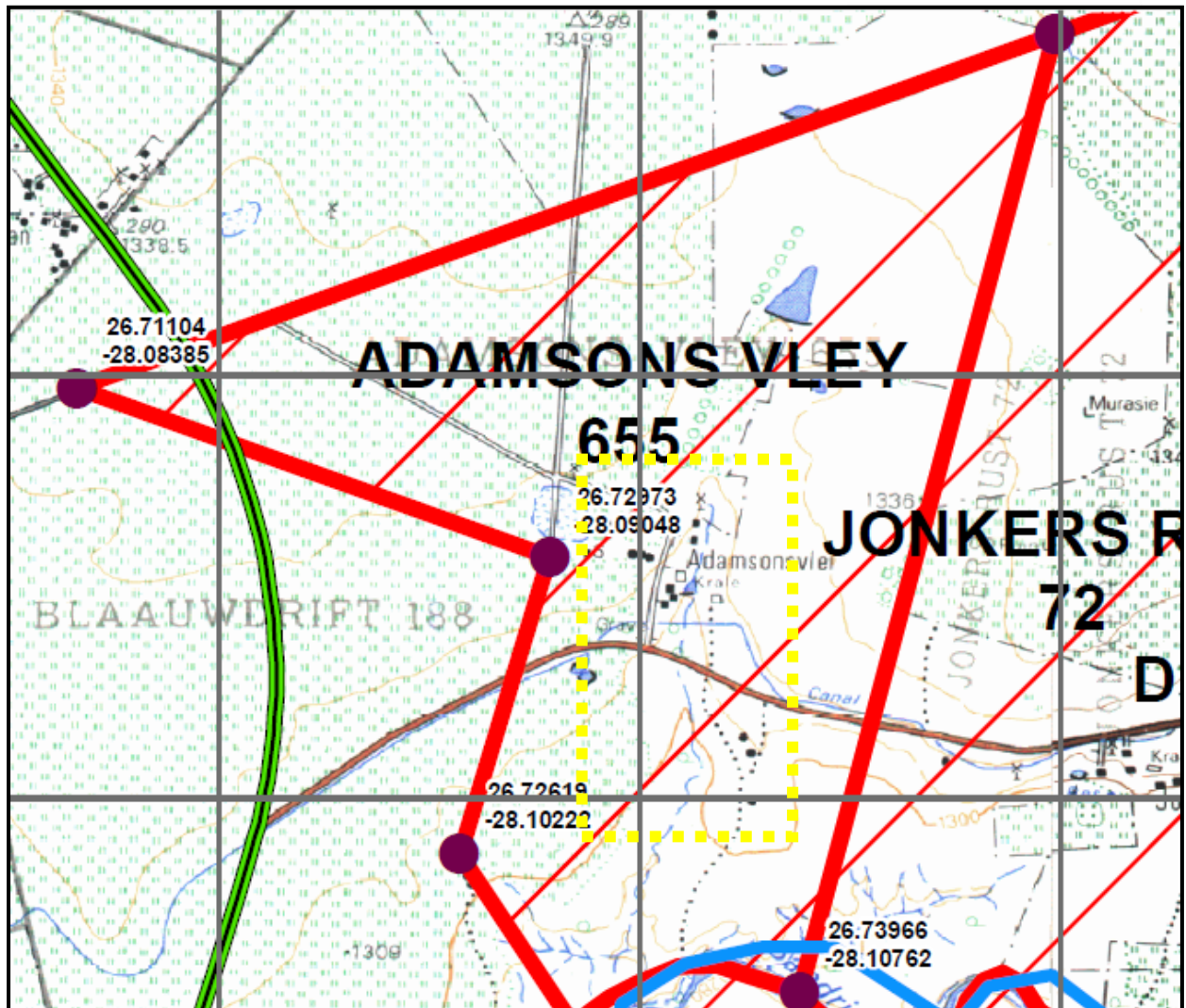


Figure 4- Built environment features on Farm Adamsons Vley 655 (yellow rectangle)

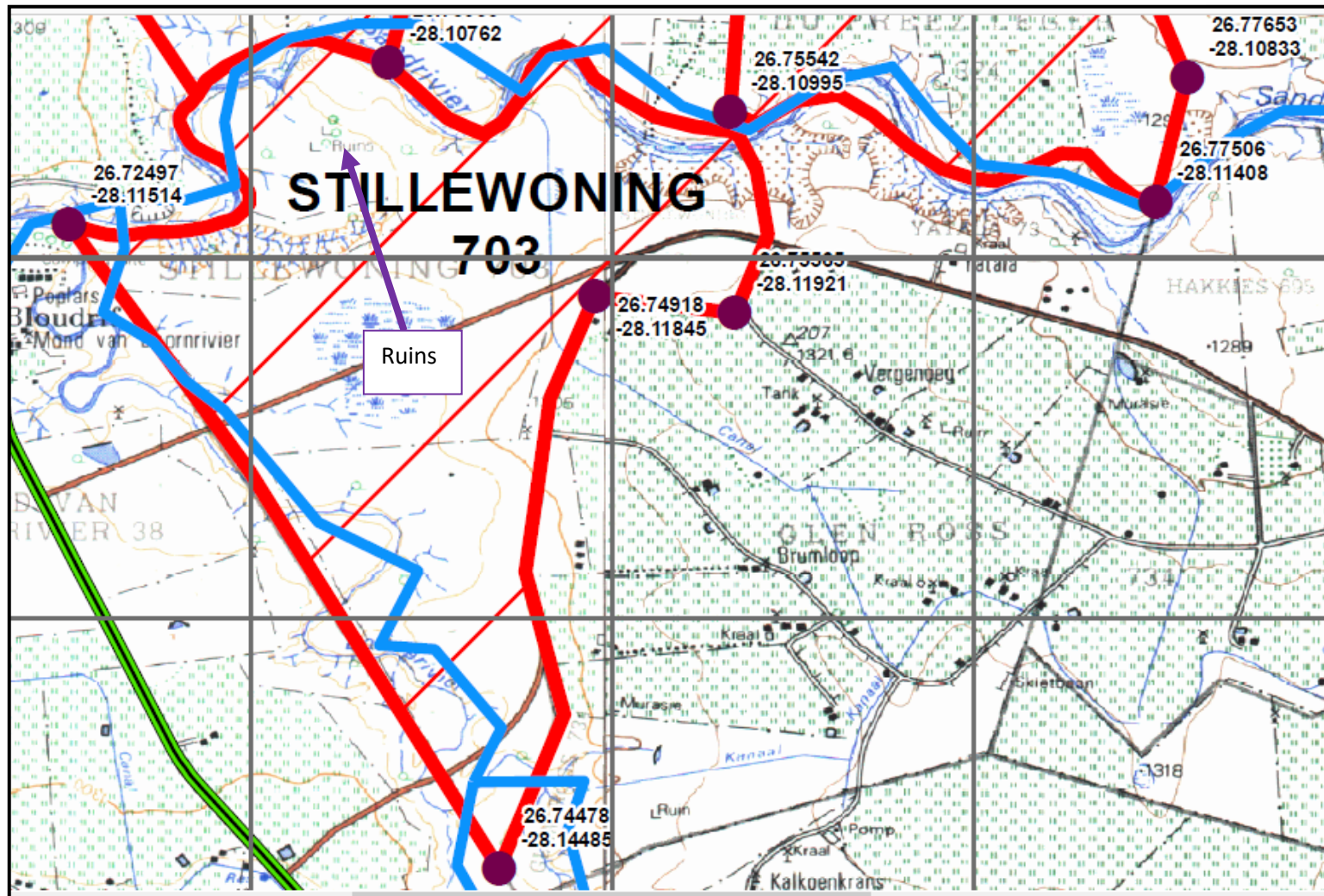


Figure 5- Location of ruins on Farm Stillewoning 703 (Purple arrow)

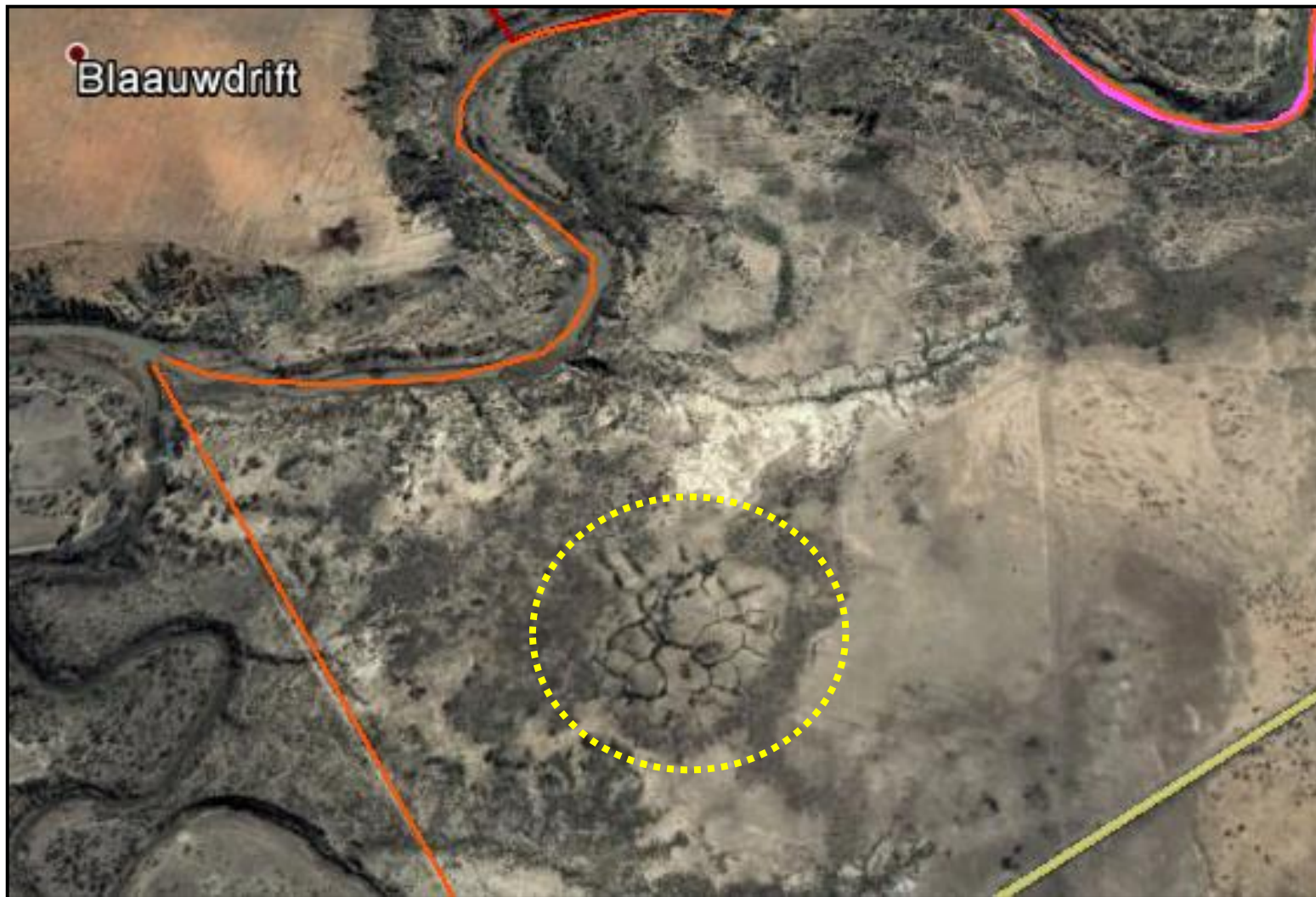


Figure 6- View of the ruins (shown on Figure 5 above) through Google Earth arial view (yellow circle)

4.5. Deeds Search

No deeds search was conducted as part of this study as per the reasons given in the exclusion section of this report.

4.6. HIAs Conducted In and Around the Proposed Development Area

The search for previously conducted HIA's in and around the proposed development area has yielded limited results. Either very few of these assessments have been conducted in the area or are not easily accessible. A report of Dr Julius CC Pretorius on a phase 1 HIA near Theunissen has yielded no prehistorical remains. However Historical farmsteads were identified as well as graveyards (Pistorius, 2013).

4.7. Findings From Earth Spotting of the Affected Environment and the Identified Cultural Environmental Features

Google Earth search of the affected area yielded the following results:

- Adamsons Vley 655
 - Located within this farm's boundaries is a water catchment area of an unknown stream. Close to it various buildings can be seen as well as some open veld and agricultural land. On the southern part of the farm, which extends all the way to the Sand River as its southern boundary, is part of the Sand River floodplain, and also within it is some agriculture land. Findings here can be historical homesteads as well as some artefacts that might be found in the runoff of the catchment area.
- Jonkers Rust 72
 - This farm is quite similar to Adamsons Vley 655, but with the exception of the catchment area. However many trees found in square formations can indicate the presence of historical homesteads
- Du Preez Leger 324
 - This farm is also quite similar to the previously described properties. However within the Sand River floodplain some agricultural land can be identified, but they do look to be in

disuse, due to many trees and scrubs that can be identified on it. These could be remnants of an historical farmstead that may have been located nearby.

- Stillewoning 703
 - This farm is located on the southern banks of the Sand River and the Doring River is located on the western boundary. Very little human interference can be detected apart from a building located on the north-eastern boundary of the property

Similarly to cadastral search, the Google Earth spotting of the affected farms show areas with a possibility of yielding historical burial grounds and grave (i.e. cemeteries or graveyards). Some of these may not necessarily be in homesteads but also along floodplains of the Sand River. *Trekboers* have been known to bury their dead on floodplain due to the ease of which graves can be dug in the sandy soil.

5. DISCUSSION OF THE RESULTS

From the background information search of the background history of the area, the possibility of archaeological resources do exist, most particularly of historic nature, due to the earth spotting search. Many vegetation patterns within the search indicate *Trekboers* or *Voortrekker* settlement. The possibility over various artefacts may exist within the previously mentioned catchment area and these can be of historic and prehistoric nature. The possibility of rock art should not be ruled out since there is a small rock ridge on the northern side of the Sand River flood plain. Within this ridge rock overhangs may be located and contain rock art. And the possibility also exists for rock engravings on boulders. Graveyards may also be located within the proposed development area. They may be of historical nature or associated with the mine located to the north-east. It is recommended that a physical survey be conducted since very few HIA reports have been done on this specific area (or the possibility does exist that these reports are not easily accessible, as previously mentioned) and the possibility of finding various archaeological sites.

6. CONCLUSIONS

The following conclusions are made about the proposed development area:

- It is concluded that the current study (inclusive of Palaeontology desktop study) is only a desktop scoping study and not a heritage impact assessment study.
- It is development to form part of a BAR (Basic Assessment Report) for application of prospective rights in the affected properties. The proposed prospecting rights are none invasive and based on historic database.
- Therefore no survey of the affected properties has taken place; a site orientation of the project area is to be conducted on Wednesday the 7th December 2016 to take images for the attention of SAHRA during SAHRIS report submission (Please note! No contact will be made with property owners or detail survey of affected properties will take place)
- Based on the available database of the affected properties (i.e. the four farms), the affected properties have the potential to yield archaeological resources in form of Stone Age materials along the river banks, Iron Age and historic archaeology settlements such as ruins and stonewalling are also likely to be found along the flood plans and on the flat plains.
- These properties also have the potential to yield burial ground and graves in form of graveyards and cemeteries associated with historic and modern settlements in the area.
- Rock Art resources are more likely to be found in rock shelters along major rivers that cut through the study area.
- In total over 32 built environment and landscape features have been identified during the scoping study and they present social and heritage risks to future mining activities; however, such risk can be mitigated.
- Based on the type of prospecting activities proposed for this project i.e. none invasive based on historic database – it is concluded that the current scoping study (inclusive of PDS) is sufficient for current DMR application.

7. RECOMMENDATIONS

The following recommendations are made about the proposed development:

- It is recommended that a detailed heritage impact assessment (HIA) be conducted once this report has been reviewed by the SAHRA and the FS-PHRA and prior to conducting mining activities on the affected properties.
- The HIA should consider the newly proposed SAHRA Minimum Standards for conducting an HIA
- The HIA should include a detailed survey of the affected properties in search of archaeological and heritage resources that are likely to be affected by future mining activities on site
- The survey should focus on those areas that are more likely to yield heritage resources.
- The HIA should record and document all the identified resources must be undertaken using the necessary tools and equipment and impact evaluation and assessment process.
- The identified heritage resources should be assessed in terms of their heritage significance using the system of field grading.
- Levels of impacts on the identified resources as the result of mining activities should be assessed or evaluated.
- The HIA should make recommendations for mitigating / managing impacts on affected resources, individuals and communities.
- Based on the nature of proposed prospecting activities, non-invasive, it is recommended that SAHRA and DMR should allow Sunshine to proceed with the project

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