Proposed Mokopane Water Treatment Works (WTW) Project

Located near the town of Mokopane and situated within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province.

Heritage Impact Assessment

Template Number	Document Number	Revision	Date
PGS PJ REP 007 01	740HIA-001	2.0	2023/09/28

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REVISION HISTORY

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Version	Issue Date	Description of Changes
001	2023/09/11	First version of the report submitted to the client.
002	2023/09/28	Final reviewed version of the report submitted to the client.

Declaration of Independence

I, Polke D. Birkholtz, declare that –

- General declaration:
- I act as the independent heritage practitioner in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting heritage impact assessments, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in section 38 of the NHRA when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- All the particulars furnished by me in this form are true and correct;
- I will perform all other obligations as expected from a heritage practitioner in terms of the Act and the constitutions of my affiliated professional bodies; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the NEMA.

Disclosure of Vested Interest

- I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;

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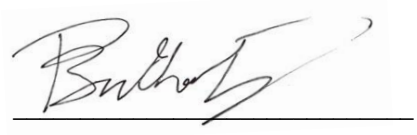
SIGNATURE: 

ACKNOWLEDGEMENT OF RECEIPT

Report Title	Heritage Impact Assessment for the Proposed Mokopane Water Treatment Works (WTW) Project located near the town of Mokopane and situated within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province.		
Control	**Name**	**Signature**	**Designation**
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Co-Author and Internal Review	PD Birkholtz		PGS Heritage Project Manager/ Archaeologist

CLIENT: Zutari (Pty) Ltd

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The Heritage Impact Assessment Report has been compiled considering the National Environmental Management Act (Act No. 107 of 1998) (NEMA): Appendix 6 of the Environmental Impact Assessment (EIA) Regulations of 2014 (as amended, 2017) requirements for specialist reports as indicated in the table below.

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	**Relevant section in report**
1.(1) (a) (i) Details of the specialist who prepared the report	Pages iii & iv of Report
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 and Appendix A
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page iii of the report
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1 and Section 2
(cA) An indication of the quality and age of base data used for the specialist report	N/A
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 4
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 3
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4
(g) An identification of any areas to be avoided, including buffers	N/A
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	N/A
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 5
(k) Any mitigation measures for inclusion in the EMPr	Section 6
(l) Any conditions for inclusion in the environmental authorization	Sections 6 and 7
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorization	Sections 6 and 7
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Executive Summary and Section 7
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and	
(n)(ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Sections 6 and 7
(o) A description of any consultation process that was undertaken during the course of carrying out the study	N/A
(p) A summary and copies if any comments that were received during any consultation process	N/A
(q) Any other information requested by the competent authority.	N/A
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	No protocols or minimum standards for HIAs or PIAs

EXECUTIVE SUMMARY

Introduction

PGS Heritage (Pty) Ltd (PGS) was appointed by Zutari (Pty) Ltd (the client) to undertake a Heritage Impact Assessment (HIA) for the proposed Mokopane Water Treatment Works (WTW) Project. The proposed project is located near the town of Mokopane, which is situated in the Limpopo Province. It falls within the Mogalakwena Local Municipality and the Waterberg District Municipality.

Desktop Study

A detailed archaeological and historical review of the project area and surrounding landscape was undertaken. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

Fieldwork

The fieldwork undertaken for this study aimed to identify tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of walkthroughs of the proposed development footprint areas. This fieldwork was conducted on Wednesday, 30 August 2023, by an archaeological fieldwork team comprising one archaeologist (Michelle Sachse) and two archaeological fieldwork assistants (Chene Ackerman and Duncan McLean). The fieldwork team was supported by Samuel Mashishi and Philemon Rabalao, who are two Community Liaison Officers (CLO) working on one of PGS's other projects in the surrounding area.

Hand-held GPS devices were used throughout the fieldwork to record the tracklogs showing the routes followed by the archaeologists and heritage specialists on site. Refer to **Figure 30** for the map depicting the tracklogs recorded during the fieldwork.

Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

Impact Assessment

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. As indicated in **Section 1.3** (Assumptions and Limitations), the risk exists for heritage resources not identified during the present fieldwork to be located within the study area. This risk is due to the vegetation cover observed in sections of the study area, and the identification and excavation of Iron Age sites a few kilometres northeast of the study area (Huffman & Steel, 1996). Additionally, a section of the

latest footprint for the Preferred Site was only available after the fieldwork and could not be assessed in the field.

The following impact risk can, therefore, be identified:

- Destruction of presently unknown heritage resources

The impact assessment undertaken in **Table 4** has revealed that the significance of the unmitigated impact risk in terms of the destruction of presently unknown heritage resources is expected to be of **Moderate (Negative) Significance**. The assessment has also indicated that the impact risk is expected to be of **Low (Negative) Significance once mitigation is completed**. This calculation clearly indicates that mitigation would be required. The required mitigation is provided in **Chapter 6** below.

Mitigation

As no heritage resources were identified during the fieldwork, no impact assessment calculations could be undertaken to assess the impact of the proposed development on identified heritage sites. However, the risk was identified for presently unknown heritage resources to be destroyed during construction activities. Mitigation measures would be required to address the identified impact risk.

The following mitigation measures are required:

- An archaeological watching brief must be implemented during the construction phase. This watching brief is aimed at monitoring the construction and excavation work for any archaeological deposits and features which may be exposed during these development activities.

Conclusions

On the condition that the general recommendations and mitigation measures outlined in this HIA report are adhered to and in cognisance of the assumptions and limitations contained in this HIA report, no heritage reasons can be given for the development not to continue.

TABLE OF CONTENT

List of Appendices

TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

- material remains resulting from human activity 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 10m 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 a change to the nature, appearance or physical nature of a place or influence its stability and future well-being, including:

- construction, alteration, demolition, removal or change in use of a place or a structure at a place;
- carrying out any work on or, over or under a place;
- subdivision or consolidation of land comprising a place, including the structures or airspace of a place;
- constructing or putting up for display signs or boards;
- any change to the natural or existing condition or topography of land; and
- any removal or destruction of trees, vegetation or topsoil.

Early Stone Age

The archaeology of the Stone Age between 700 000 and 2 500 000 years ago.

Fossil

Mineralised bones of animals, shellfish, plants and marine animals. A trace fossil is the track or footprint of a fossil animal that is preserved in stone or consolidated sediment.

Heritage

That which is inherited and forms part of the National Estate (historical places, objects, fossils as defined by the National Heritage Resources Act 25 of 1999).

Heritage resources

This means any place or object of cultural significance and, as stated under Section 3 of the NHRA, can include the following:

- places, buildings, structures and equipment of cultural significance;
- places to which oral traditions are attached or which are associated with living heritage;
- historical settlements and townscapes;
- landscapes and natural features of cultural significance;
- geological sites of scientific or cultural importance;
- archaeological and palaeontological sites;
- graves and burial grounds, and
- sites of significance relating to the history of slavery in South Africa;

Holocene

The most recent geological time period which commenced 10,000 years ago.

Living / Intangible Heritage *(AASW 3 4H, 2020)*

The intangible aspects of inherited culture could include cultural tradition, oral history, performance, ritual, popular memory, skills and techniques, indigenous knowledge systems, the holistic approach to nature, society and social relationships.

Late Stone Age

The archaeology of the last 30,000 years associated with fully modern people.

Late Iron Age (Early Farming Communities)

The archaeology of the last 1000 years up to the 1800s associated with iron-working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

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

Abbreviations	Description
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
ECO	Environmental Control Officer
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Late Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHS	Provincial Heritage Site
PSSA	Palaeontological Society of South Africa
SAHRA	South African Heritage Resources Agency
WTW	Water Treatment Works

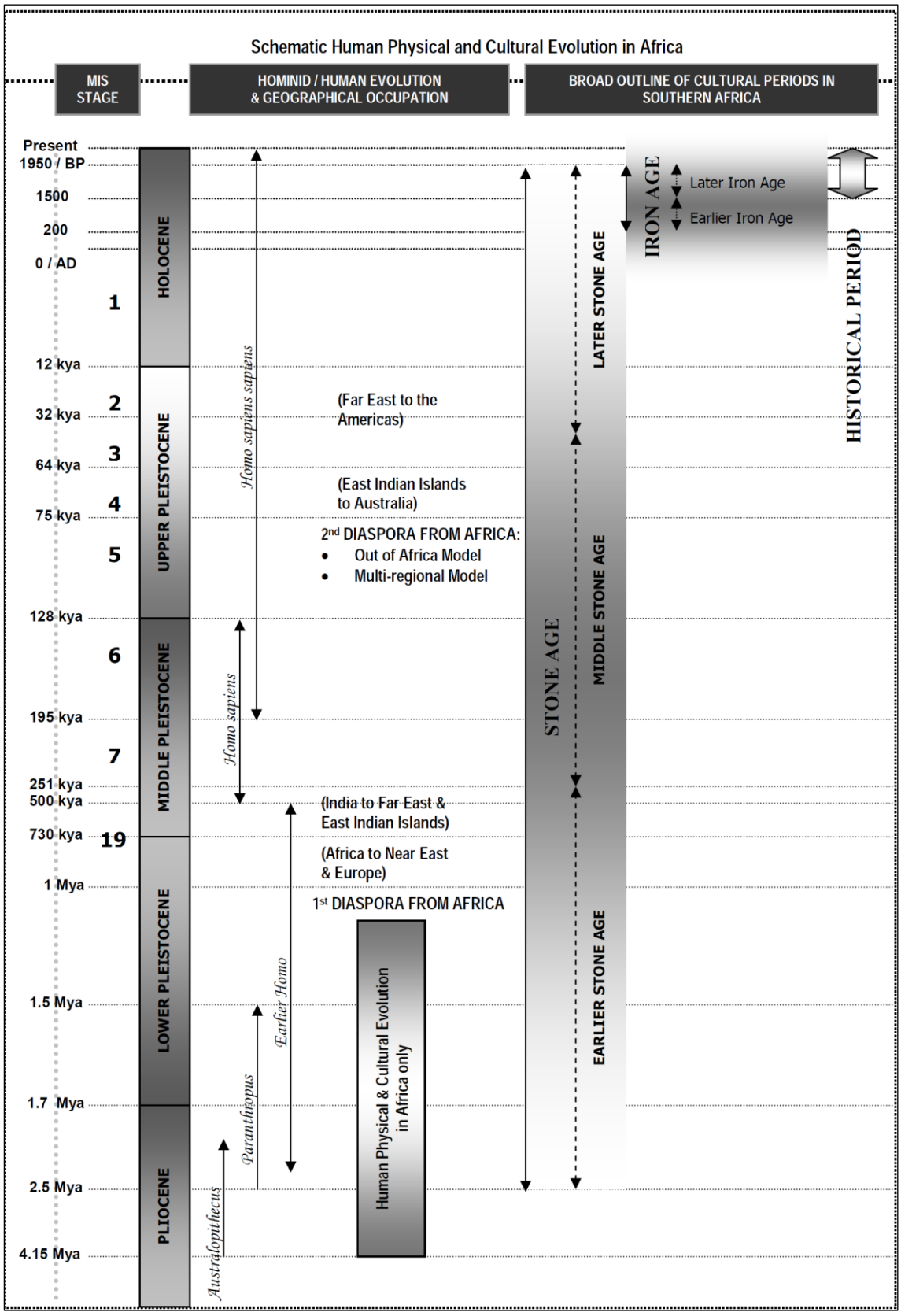

Figure 1 – Human and Cultural Timeline in Africa

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Zutari (Pty) Ltd (the client) to undertake a Heritage Impact Assessment (HIA) for the proposed Mokopane Water Treatment Works (WTW) Project. The proposed project is located near the town of Mokopane, which is situated in the Limpopo Province. It falls within the Mogalakwena Local Municipality and the Waterberg District Municipality.

1.1 Scope of the Study

The aim of the study is to identify heritage sites and finds that may occur in the proposed project area. The HIA aims to inform the EIA to assist the developer in managing the discovered heritage resources in a responsible manner in order to protect, preserve, and develop them within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This HIA Report was compiled by PGS. The company and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently. The following staff members from PGS compiled this study:

- Polke D. Birkholtz, the project manager, principal heritage specialist and co-author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is also accredited with the CRM Section of the same association. He has 22 years of experience in the heritage assessment and management field. He holds a B.A. (cum laude) from the University of Pretoria, specialising in Archaeology, Anthropology and History and a B.A. (Hons.) in Archaeology (cum laude) from the same institution.

- Michelle Sachse, the author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist, membership number 526. She has three years of experience in the heritage assessment and grave relocation field and holds a master's degree (MA) in Archaeology from the University of Pretoria.

1.3 Assumptions and Limitations

The following assumptions and limitations apply to this report:

- It is important to realise that the heritage resources located during the fieldwork do not

necessarily represent all the possible heritage resources present within the area. This may inter alia be due to dense vegetation cover and the subterranean characteristics of archaeological sites. As a result, it is always possible that the fieldwork findings made in this report do not completely indicate the entire archaeological and heritage fabric from within the study area. Any heritage features and/or objects observed during the implementation of the project may not be disturbed or removed in any way until a heritage specialist has been able to assess the significance of the site (or material) in question. This applies to graves and cemeteries as well.

- In some cases, reasonably dense vegetation in the form of high grass characterised the study area. This resulted in limited visibility during sections of the fieldwork.
- The present fieldwork focussed primarily on tangible heritage resources. The focus on tangible heritage is guided by the general protections afforded for tangible heritage resources such as archaeology, graves, structures and public monuments and memorials as defined by sections 34 to 37 of the National Heritage Resources Act 28 of 1999.
- Please note that the authors are aware of the Makapan Valley with its various historical, archaeological and palaeontological significant sites and features such as Makapan's Caves, Cave of Hearths, etc. The authors are also aware that the Makapan Valley is both a National Heritage and a World Heritage site. However, the closest point along the declared boundary of the Makapan Valley is located approximately 10.7km east by northeast of the study area. As a result, the proposed development is not expected to have any impact on the Makapan Valley.
- The updated boundary for the Preferred Site only became available after the completion of the fieldwork. As a result, a relatively small section of this proposed footprint area was not assessed in the field. Please note that the original boundary for the Preferred Site is referred to as Preferred Site A in this report, whereas the updated boundary for the Preferred Site is referred to as Preferred Site B.

1.4 Legislative Context

The identification, evaluation and assessment of any cultural heritage site, artefact, or find in the South African context is required and governed by the following legislation:

- Notice 648 of the Government Gazette 45421- general requirements for undertaking an initial site sensitivity verification where no specific assessment protocol has been identified
- National Environmental Management Act (NEMA), Act 107 of 1998 – Appendix 6
- National Heritage Resources Act (NHRA), Act 25 of 1999

1.4.1 Notice 648 of the Government Gazette 45421

Although minimum standards for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA, GN.648 requires sensitivity verification for a site selected on the national web-based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this Government Notice (GN) are listed in **Table 1** and the applicable section in this report is noted.

Table 1: Reporting requirements for GN648

GN 648	Relevant section in report	Where not applicable in this report
2.2 (a) a desktop analysis using satellite imagery;	section 4.3	
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web-based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	4.1	-
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by the national web-based environmental screening tool;	section 4.1	-
2.3(b) contains motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity;	section 4.1	-

1.4.2 NEMA – Appendix 6 requirements

The HIA report has been compiled considering the NEMA Appendix 6 requirements for specialist reports, as indicated in the table below. For ease of reference, the table below provides cross-references to the report sections where these requirements have been addressed.

1.4.3 The National Heritage Resources Act

- National Heritage Resources Act (NHRA) Act 25 of 1999
    - Protection of Heritage Resources – Sections 34 to 36; and
    - Heritage Resources Management – Section 38

The NHRA is utilised as the basis for the identification, evaluation, and management of heritage resources, and in the case of Cultural Resource Management (CRM), those resources specifically

impacted on by development as stipulated in Section 38 of NHRA. This study falls under s38(8) and requires comment from the relevant heritage resources authority.

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Locality

2.1.1 Description of site locality

The Mokopane WTW is located 2.5 kilometres east of Mokopane on the farm Piet Potgietersrust Town and Townlands 44. The study area is located in proximity to the Mokopane Landfill site.

2.1.2 Project description

The Zutari Ndodana Joint Venture (ZNJV)[1] was previously appointed by the Trans-Caledon Tunnel Authority (TCTA) on behalf of the Department of Water and Sanitation (DWS) for the provision of professional services for the Olifants River Water Resources Development Project – Phase 2 (ORWRDP-2). Initially the Project comprised of the following phases:

- Phase 2A: Construction of De Hoop Dam
- Phase 2B: Pipeline from Flag Boshielo Dam to Pruissen near Mokopane (72km)
- Phase 2B+: New pipe for 2B extension, where existing raw water pipeline to Sekuruwe commences
- Phase 2C: Pipeline from De Hoop Dam to Groothoek
- Phase 2D: Pipeline from Steelpoort to Groothoek (24km)
- Phase 2E: Pipeline from Mooihoek to Havercroft Junction (14km)
- Phase 2F: Pipeline from Havercroft Junction to Olifantspoort (44km)
- Phase 2G: Possible second pipeline parallel to Phase 2B
- Phase 2H: Changes and additions to the current Phase 2H (Lebalelo Network); and
- Phase 2I: Pipeline from the De Hoop Dam to the proposed Eskom Tubatse Pump-storage Hydro-electric Scheme (this Phase has been cancelled).

The ORWRDP-2 has since changed to the Olifants Management Model Programme Bulk Raw Water Study Phase (OMMP – BRWSP) in recent years, with the Lebalelo Water User Association (LWUA) acting as the implementing agent for the following portions of the project:

- Phase 2B
- Phase 2B+; and
- Phase 2F

LWUA has appointed the ZNJV for the provision of professional services for the OMMP-BRWSP. The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas. These bulk pipeline systems are now identified by their respective “Phase” number. The relevant bulk pipe that would augment raw water to the Mogalakwena system (i.e., for domestic and mine use) is the proposed Phase 2B pipeline. Phase 2B has been authorised by a revised Record of Decision (rRoD) (Ref: **12/12/20/553**) issued in 2006 in terms of the Environmental Conservation Act, (No. 73 of 1989) (ECA). The proposed Water Treatment Works (WTW) are located in two locations along the alignment of Phase 2B+. This phase is an extension of Phase 2B and spans from Pruissen reservoir to Piet-se-Kop. The gravity pipeline has been authorised by EA **(12/1/9/1-W120**) and EA (**12/19/1-W131**). The OMMP-BRWSP bulk infrastructure plan makes provision for the construction of raw water pipeline systems to the identified target areas.

The Mogalakwena Local Municipality (MLM) is a Water Services Authority (WSA) as contemplated in the Water Services Act (No. 108 of 1997). Therefore, the municipality is responsible for the realisation of the right to access to basic water services: ensuring progressive realisation of the right to basic water services, subject to available resources (that is, extension of services), the provision of effective and efficient ongoing services (performance management, by laws) and sustainability (financial planning, tariffs, service level choices, environmental monitoring). The WSA has developed a Water Services Development Plan (WSDP) in conjunction with master plans for water and sanitation.

The planning for water and wastewater services in Mogalakwena culminated in the Mogalakwena Water Master Plan (MWMP). As part of the MWMP, two new WTW are to be provided, namely a works serving the Mokopane Town with an ultimate capacity of 28Ml/d and another servicing the areas north of Mokopane located near Sekuruwe Township with an ultimate design capacity of 21Ml/d.

The technical features of the scheme proposed in the MWMP (for the ultimate scheme) include the following:

- A raw water pipe from the farm Pruissen (where it connects to the bulk water pipeline from Flag Boshielo Dam) to new a WTW. This works will supply potable water to Mokopane Central Business District (CBD) and town areas.
- The raw water pipe will continue from the WTW at Mokopane, northwards to the rural town area of Sekuruwe. At this point a second WTW will be constructed. This WTW will be able to provide potable water to mining clients and residents for various rural villages.

- Mining water users will also be able to draw water from the raw water line at various points towards Sekuruwe. This will be handled by means of offtake agreements.

This Basic Assessment Report (BAR) has been compiled for the Mokopane WTW situated along the Phase 2B+ pipeline alignment. LWUA is proposing to construct the Mokopane WTW and associated infrastructure near the town of Mokopane in the MLM. The overall objective of the proposed development is to supply potable water for commercial and residential purposes.

Figure 2 – Locality map depicting the study area within its surrounding landscape.

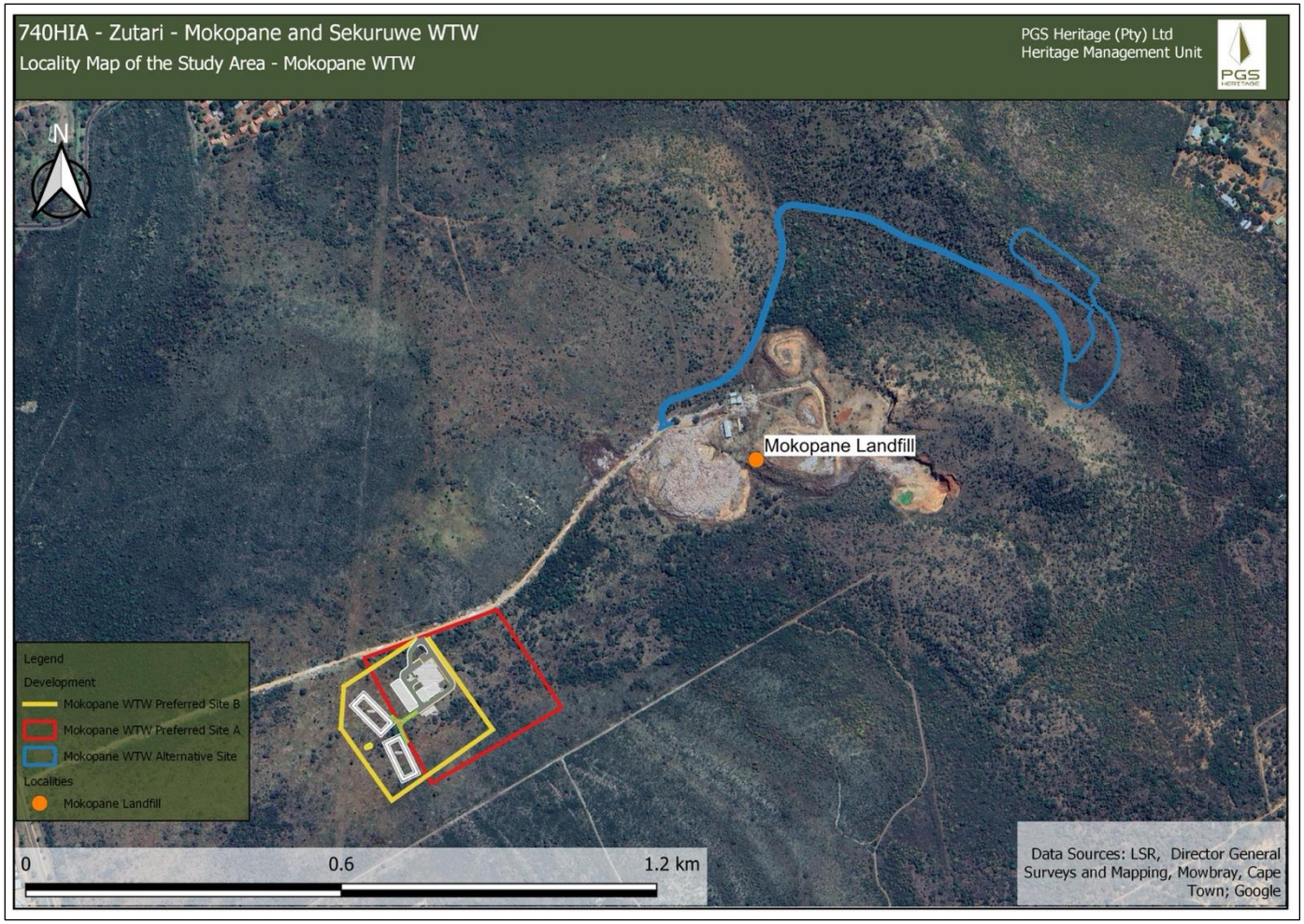

Figure 3 - Locality map depicting the study area within its immediate surroundings. Preferred Site A (red boundary) was available at the time of the fieldwork, and as a result, was assessed during the fieldwork. Preferred Site B (yellow boundary) only became available after the fieldwork. As a result, the section of this updated study area not located within the previous study area boundary, was not assessed during the fieldwork.

3 ASSESSMENT METHODOLOGY

3.1 Methodology for Conducting the Study

This HIA report was compiled by PGS for the proposed Mokopane Water Treatment Works (WTW) near the town of Mokopane in the Limpopo Province. The applicable maps, tables and figures are included, as stipulated in the NHRA (no. 25 of 1999) and the National Environmental Management Act (NEMA) (No. 107 of 1998). The HIA process consisted of three steps:

Step I – Desktop Study:

A detailed archaeological and historical review of the project area and surrounding landscape was undertaken. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, previous archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

Step II – Fieldwork:

The fieldwork undertaken for this study aimed to identify tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of walkthroughs of the proposed development footprint areas.

On Wednesday, 30 August 2023, this fieldwork was undertaken by an archaeological team comprising one archaeologist (Michelle Sachse) and two archaeological fieldwork assistants (Chene Ackerman and Duncan McLean). The fieldwork team was supported by Samuel Mashishi and Philemon Rabalao, who are two Community Liaison Officers (CLO) working on one of PGS's other projects in the surrounding area.

Hand-held GPS devices were used throughout the fieldwork to record the tracklogs showing the routes followed by the archaeologists and heritage specialists on site. Refer to **Figure 30** for the map depicting the tracklogs recorded during the fieldwork.

3.2 Site Significance

Site significance classification standards use is based on the heritage classification of Section 3(3) of the National Heritage Resources Act (No. 25 of 1999 (NHRA). The table below is provided in SAHRA's Minimum Standards for Heritage Specialist Studies in terms of Section 38 of the National

Heritage Resources Act (No. 25 of 1999) and outlines the methodology for obtaining a field rating for heritage resources.

Table 2 – Field Rating regarding Heritage Significance as Prescribed by SAHRA

NHRA Section (3) "Without limiting the generality of subsections 1 and 2, a place or object is to be considered part of the national estate if it has cultural significance or other special value because of –"	**Applicable or not**	**Rating** Neglible / Low / Low-Medium / Medium / Medium-High / High / Very High
(a) its importance in the community, or pattern of South Africa's history		
(b) its possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage		
(c) its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage		
(d) its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects		
(e) Its importance in exhibiting particular aesthetic characteristics valued by a community or cultural group		
(f) Its importance in demonstrating a high degree of creative or technical achievement at a particular period		
(g) Its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons		
(h) Its strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa		
(i) Sites of significance relating to the history of slavery in South Africa		
Reasoned assessment of significance using appropriate indicators outlined above:		

The table below provides an understanding of the field rating versus heritage significance and recommended mitigation measures. This table was compiled from a table provided in SAHRA's minimum requirements for archaeological assessments and was amended to include comments made in SAHRA's Minimum Standards for Heritage Specialist Studies.

Table 3 – Site significance classification as prescribed by SAHRA

FIELD RATING	GRADE	SIGNIFICANCE	RECOMMENDED MITIGATION
National Significance (NS)	Grade 1	-	Conservation; National Site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; Provincial Site nomination
Local Significance (LS)	Grade 3A	High	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High/Medium	Mitigation (Part of site should be retained)
Local Significance (LS)	Grade 3C	Low/Medium and Low	Destruction after recording

3.3 Methodology used in Determining the Significance of Environmental Impacts

The impact assessment methodology used for the purposes of this report was provided by the client. Refer to **Appendix B**.

4 CURRENT STATUS QUO

4.1 Site Description

Two development alternatives for the project are currently proposed. These will be individually discussed in this section.

The Alternative Site that is currently proposed comprises two different development footprints (the WTW and access road) located along the summit and southwestern slope of a low mountain or ridge situated northeast of the Mokopane landfill. The proposed WTW here extends over an area of roughly 2.2 hectares in extent. The associated access road is approximately 1.8 kilometres in

length. The access road starts on the dirt road next to the Mokopane landfill and continues along the slope of the ridge until it reaches its top. At this point, the development footprint for the Mokopane WTW starts. The footprint areas for both the access road and WTW are characterised by quite often steep rocky slopes covered in grass with small trees and bushes also evident. At the top of the ridge, the footprint is also characterised by exposed bedrock. A fence divides the footprint area of the Mokopane WTW. Refer **Figure 4** to **Figure 9** below.

Figure 4 - View from the top of the ridge, with the Mokopane landfill and a section of the town of Mokopane in the background.

Figure 5 - General view of the terrain associated with the proposed access road heading up the hill next to the landfill. Note the steep slopes characterising the study area.

Figure 6 – Another view of the proposed access road.

Figure 7 – This rock-strewn slope is located within a section of the proposed access road.

Figure 8 - General view of the dense vegetation found within the footprint area of the proposed Mokopane WTW at the top of the ridge.

Figure 9 – This fence divides the footprint area associated with the Mokopane WTW.

The Preferred Site for the Mokopane WTW is located approximately 400m west by southwest of the Mokopane landfill area and is located along the dirt road leading to the landfill. Its position along the existing dirt road means that no access road is required for this alternative. The footprint area is 6.8 hectares in extent. Sections of this area had been disturbed by dumping activities, possibly related to the landfill.

The footprint area for the Preferred Site is very overgrown with tall grass, which limited visibility and made surveying difficult. Small bushes and trees were found scattered across the area. Compared with the Alternative Site, the topography found within this area was less steep.

Refer **Figure 10** to **Figure 13** below.

Figure 10 - General view of the preferred site with the Mokopane Landfill in the background.

Figure 11 – View taken within the preferred site. Note the dense grass found here.

Figure 12 – Another view taken within the preferred site.

Figure 13 – Evidence of dumping activities was found within the preferred site area.

4.2 Heritage Desktop

4.2.1 Archaeological overview of the study area and surrounding landscape

4.2.1.1 Stone Age sequence

4.2.1.1.1 Early Stone Age (ESA) (>200 000 – 2 million years Before Present/BP)

General characteristics: Early stages include simple flakes struck from cobbles, core and pebble tools; later stages include intentionally shaped handaxes, cleavers and picks; final or transitional stages have tools that are smaller than the preceding stages and include large blades (Lombard *et al.* 2012). Phases of the Early Stone Age:

- *Oldowan*: 1.5 to >2 million years ago - Technological characteristics: Cobble, core or flake tools with little retouch and no flaking to predetermined patterns; Hammerstones, manuports, cores; and polished bone fragments/tools (Lombard *et al.* 2012).
- *Acheulean*: 300 thousand to 1.5 million years ago - Technological characteristics: Bifacially worked handaxes and cleavers, large flakes > 10 cm; some flakes with deliberate retouch, sometimes classified as scrapers; gives the impression of being deliberately shaped, but could indicate the result of knapping strategy; sometimes shows core preparation, and generally found in disturbed open-air locations (Lombard *et al.* 2012).
- *ESA-MSA transition*: 200 to 600 thousand years ago - Technological characteristics: Described at some sites as *Fauresmith* or *Sangoan*; *Fauresmith* assemblages have large blades, points, Levallois technology, and the remaining ESA components have small bifaces; the *Sangoan* contains small bifaces (<100 mm), picks, heavy and light-duty denticulated and notched scrapers; The *Sangoan* is less well described than the *Fauresmith* (Lombard *et al.* 2012).

Although such archaeological sites do exist, Limpopo Province is not as well known for its Early Stone Age resources as in other parts of the country. The closest occurrences of major finds from this time period are associated with the Makapan Valley. For example, the Cave of Hearths (Herries 2011), which is dated to 1.1-1.4 Ma (best age estimates interpreted from contexts of direct/associated dates), is characterised by *Acheulian* assemblages.

The Makapan Valley and its sites are located approximately 35km southeast of the Mogalakwena Mine Complex.

4.2.1.1.2 Middle Stone Age (MSA) (20 000 – 300 000 BP)

General characteristics: Levallois or prepared core techniques (for definitions see Van Peer 1992; Boeda 1995; Pleurdeau 2005) occur in which triangular flakes with convergent dorsal scars, often with faceted striking platforms are produced; Discoidal systems (for definition see Inizan et al. 1999) and intentional blade production from volumetric cores (for definition see Pleurdeau 2005) also occur; formal tools may include unifacially and bifacially retouched points, backed artefacts, scrapers, and denticulates (for definition see Bisson 2000); evidence of hafted tools; occasionally includes marine shell beads, bone points, engraved ochre nodules, engraved OES fragments, engraved bone fragments, and grindstones (Lombard *et al.* 2012). Phases of the MSA:

- *early Middle Stone Age*: 130 to 300 thousand years - Technological characteristics: Includes discoidal and Levallois flake technologies, blades from volumetric cores and a generalised toolkit (Lombard *et al.* 2012).

- *Klasies River*: 105 to 130 thousand years ago - Technological characteristics: Recurrent blade and convergent flake production; end products are elongated and relatively thin, often with curved profiles; platforms are often small with diffused bulbs; low frequencies of retouch; and denticulated pieces (Lombard *et al.* 2012).

- *Mossel Bay*: 77 to 105 thousand years ago - Technological characteristics: Recurrent uni-polar Levallois point and blade reduction; products have straight profiles; percussion bulbs are prominent and often splintered or ring-cracked; formal retouch is infrequent and restricted to sharpening the tip or shaping the butt (Lombard *et al.* 2012).

- *Still Bay*: 70 to 77 thousand years ago - Technological characteristics: Characterised by thin (<10 mm), bifacially worked foliate or lanceolate points; semi-circular or wide-angled pointed butts; and could include blades and finely serrated points (Lombard et al. 2010).

- *Howieson's Poort*: 58 to 66 thousand years ago - Technological characteristics: Characterised by blade technology; includes small (<4 cm) backed tools, e.g. segments, scrapers, trapezes and backed blades; some denticulated blades; and pointed forms are rare or absent (Lombard *et al.* 2012).

- *Sibudu*: 45 to 58 thousand years ago – Technological characteristics: Most points are produced using Levallois technique; most formal retouch aimed at producing unifacial points; some plain butts; rare bifacially retouched points; some side scrapers are present, and backed pieces are rare (Lombard *et al.* 2012).

- *Final Middle Stone Age*: 20 to 40 thousand years - Technological characteristics: Characterised by high regional variability that may include, e.g. bifacial tools, bifacially

retouched points, hollow-based points; triangular flake and blade industries; small bifacial and unifacial; Sibudu point characteristics: short, stout, lighter in mass compared to points from the Sibudu technocomplex, but heavier than those from the Still Bay; can be microlithic; can include bipolar technology; and could include backed geometric shapes such as segments, as well as side scrapers (Lombard *et al.* 2012).

Most MSA sites in Limpopo Province are caves or rock shelters. Some of the nearest well-published MSA sites include Mwulu's Cave, located approximately 28km southeast of the study area (Tobias 1949; Sampson 1974), the Cave of Hearths, located about 35km southeast of the study area (Mason 1962, 1988; Sampson 1974; Sinclair 2009), and Olieboomspoort Shelter, which is situated approximately 131km west of the study area (Mason 1962; Van der Ryst 2006).

4.2.1.1.3 Later Stone Age (LSA) (40 000 – < 2 000 BP)

General characteristics: Variability between assemblages; a wide range of formal tools, particularly scrapers (microlithic and macrolithic), backed artefacts, evidence of hafted stone and bone tools, borers, bored stones, upper and lower grindstones, grooved stones, ostrich eggshell (OES) beads and other ornaments, undecorated/decorated OES fragments, flasks/flask fragments, bone tools (sometimes with decoration), fishing equipment, rock art, and ceramics in the final phase (Lombard *et al.* 2012). Identified phases of the Later Stone Age are as follows:

- *early Later Stone Age*: 18 to 40 thousand years ago - Technological characteristics: Characterised by unstandardised, often microlithic, pieces and includes the bipolar technique; described at some sites, but not always clear whether assemblages represent a real archaeological phase or a mixture of LSA/MSA artefacts (Lombard *et al.* 2012).

- *Robberg*: 12 to 18 thousand years ago - Technological characteristics: Characterised by systematic bladelet (<26 mm) production and the occurrence of outils écaillés or scaled pieces (for the definition of outils écaillés see Hayden 1980); significant numbers of unretouched bladelets and bladelet cores; few formal tools; and some sites have significant macrolithic element (Lombard *et al.* 2012).

- *Oakhurst*: 7 to 12 thousand years ago - Technological characteristics: Flake-based industry; characterised by round, end, and D-shaped scrapers and adzes; wide range of polished bone tools; and few or no Microliths (Lombard *et al.* 2012).

- *Wilton*: ~4 to 8 thousand years ago - Technological characteristics: Fully developed microlithic tradition with numerous formal tools; highly standardised backed microliths and small convex scrapers (for a definition of standardisation, see Eerkens & Bettinger 2001);

OES is common; Ochre is common; and bone, shell and wooden artefacts occur (Lombard *et al.* 2012).

- *Final Later Stone Age:* ~1 hundred to ~4 thousand years ago - Technological characteristics: Much variability can be expected; variants include macrolithic (similar to *Smithfield* [Sampson 1974]) and/or microlithic (similar to *Wilton*) assemblages; assemblages are mostly informal (*Smithfield*); often characterised by large untrimmed flakes (*Smithfield*); sometimes microlithic with scrapers, blades and bladelets, backed tools and adzes (*Wilton*-like); worked bone is common; OES is common; Ochre is common; iron objects are rare; ceramics are absent (Lombard *et al.* 2012).

- *Ceramic final Later Stone Age*: Generally <2 thousand years ago - Contemporaneous with, and broadly similar to, final Later Stone Age, but includes ceramics - Economy may be associated with hunter-gatherers or herders -Technological characteristics: Stone tool assemblages are often microlithic (for a definition of 'microlithic' see Elston & Kuhn 2002);iIn some areas they are dominated by long end scrapers and few backed Microliths and in others formal tools are absent or rare; grindstones are common, ground stone artefacts, stone bowls and boat-shaped grinding grooves may occur; includes grit- or grass-tempered pottery; ceramics can be coarse, or well-fired and thin-walled; sometimes with lugs, spouts and conical bases; sometimes with decoration; sometimes shaped as bowls; Ochre is common; OES is common; metal objects, glass beads and glass artefacts also occur (Lombard *et al.* 2012).

Some of the nearest well-published LSA sites include Goergap, situated approximately 28km southwest of the study area (Van der Ryst 1998), and New Belgium, located approximately 44km to the northwest (Van der Ryst 1998).

4.2.1.1.4 Rock Art

Background to Hunter-Gatherer Rock Art (after Hollmann, 2019)

Rock art sites have been recorded within the surroundings of Mokopane, and these sites represent some of the oldest cultural components of the surroundings of the study area. However, it is important to note that none of the development footprints currently proposed are located near any of these known rock art sites. As a result, the current footprints will have no impact on these sites.

To appreciate the place of rock art in the deep history of the region, some background is required. The narrative begins tens of thousands of years ago when groups of hunter-gatherers crisscrossed the study area gathering plant foods, trapping and hunting animals. Scatters of Middle Stone Age

stone tools in the study area are evidence of this.

Over thousands of years, the hunter-gatherers developed new tools and hunting technologies. This period, called the Later Stone Age, goes back about 10,000 years. It is these Later Stone Age hunter-gatherers who made rock art.

A vital feature of rock art is that it has a permanent presence in the landscape. The existence of rock art sites in the surroundings of the study area demonstrates that already, thousands of years ago, people transformed a natural environment into a humanized landscape. The rock art sites in the study area, as well as landforms, especially the hills and water sources, would have been named and linked to peoples' beliefs, stories, legends and rituals. Generations of hunter-gatherer people probably visited and used them for ceremonial purposes.

Hunter-gatherer rock art sites were regarded as 'strong' places in the landscape. At these locales, hunter-gatherer artists created a mystical force called *n/om* by painting what the modern-day Kalahari San call the 'great meat animals' (e.g. kudu, elephant). These animals are filled with n/om.

The artists also made images of people interacting with the animals. Sometimes, they depicted people in dance postures that are part of healing dances still performed in the Kalahari. Contrary to popular belief, rock art is not a 'menu' of food that the hunter-gatherers ate or a 'diary' of everyday life. The paintings themselves are 'images of power', not just beautiful art.

The way that the paintings are placed on the rock shows that the hunter-gatherers did not use Western perspectives to depict their subject matter. Rock art does not have a regular frame around it. The paintings at a rock art site are often an accumulation of images made over time, not an organized composition that tells a single narrative. Instead, they are arranged according to other conventions that we do not fully understand.

South Africa’s rock art tradition is the engravings and paintings produced by foragers or San communities (Smith & Ouzman 2004). Though considered predominantly shamanistic and symbolic, San rock art also concerns gender, landscape, and politics (Smith & Ouzman 2004).

In addition, Bantu-speaking farmers’ rock art also exists that was made by groups that appeared in southern Africa about 2,000 years ago (Vogel 1995) from East and Central Africa (e.g., Ten Raa 1974; B. Smith 1995, 1997, 2002). This art has several distinct traditions, among them the northern Sotho initiation and protests rock arts (Smith and van Schalkwyk 2002, van Schalkwyk and Smith 2004), the rock engravings of Late Iron Age settlements (e.g., Maggs 1995), and the boys’ initiation rock art of the southern Sotho and Zulu. Most of these traditions are informed by oral history, and

some may continue to be practised (Smith & Ouzman 2004).

4.2.1.2 Iron Age sequence

4.2.1.2.1 Overview of the Iron Age

In the northern regions of South Africa, at least three settlement phases have been distinguished for early prehistoric agropastoralist settlements during the Early Iron Age (EIA). Diagnostic pottery assemblages can be used to infer group identities and to trace movements across the landscape. The first phase of the Early Iron Age, known as Happy Rest (named after the site where the ceramics were first identified), is representative of the Western Stream of migrations and dates to AD 400 - AD 600. The second phase of Diamant is dated to AD 600 - AD 900 and was first recognized at the eponymous site of Diamant in the western Waterberg. The third phase, characterised by herringbone-decorated pottery of the Eiland tradition, is regarded as the final expression of the Early Iron Age (EIA) and occurs over large parts of the North West Province, Northern Province, Gauteng and Mpumalanga. This phase has been dated to about AD 900 - AD 1200. These sites are usually located on low-lying spurs near water (Coetzee 2015).

The Late Iron Age settlements are characterised by stone-walled enclosures and date to the period AD 1640 to AD 1830. This occupation phase has been linked to the arrival of ancestral Northern Sotho, Tswana and Ndebele (Nguni-speakers) in the northern regions of South Africa, with associated sites dating between the sixteenth and seventeenth centuries. The terminal LIA is represented by late 18th/early 19th century settlements with multichrome Moloko pottery commonly attributed to the Sotho-Tswana. In many instances, these settlements can be correlated with oral traditions on population movements during which these farming communities sought refuge in mountainous regions during the disruption resulting from the so-called difaqane (or Mfecane) (Coetzee 2015).

4.2.1.2.2 Regional Iron Age settlement (after Biemond 2019)

Iron Age people are known for their skill in manufacturing ceramics and the working of iron and other metals. They also practised agriculture and animal husbandry and are associated with aggregated large settlements, a system of kingship and emerging civilisations.

The earliest identified Iron Age tradition south of the Limpopo River is the *Happy Rest* facies (dating from approximately AD 400 to AD 700). A facies or ceramic unit is named after the site where the ceramics were first identified, and all similar ceramics are subsequently named after the name or type site. For example, the *Happy Rest* facies were first identified at Happy Rest (also known as

the Schoemansdal Field School) near the town of Louis Trichardt. The facies name is also used to refer to the group of people who produced a particular ceramic style (Huffman 2007) so that the *Happy Rest* people would have produced the *Happy Rest* ceramic unit. The Early Iron Age (*Happy Rest*) people first settled in the gorges of the Soutpansberg mountain ranges in small villages (Prinsloo 1974). In the central and eastern Limpopo Province, the *Happy Rest* facies developed into the *Doornkop* facies, present in the archaeological record until approximately AD 1000 (earliest pottery identified at Blinkkop Hill). In the western Limpopo Province, the *Happy Rest* facies developed into the *Diamant* facies with further development by AD 1000 into the Middle Iron Age *Eiland* facies, which spread out across the former Transvaal and continued until the fifteenth century in the south-eastern Botswana region (Denbow 1981). *Eiland* facies ceramics were mainly identified at the potential rain control sites on Blinkkop Hill and Mohlotlo Hill.

The people that further added to the cultural mixture of the Mokopane area were the Late Iron Age Northern Sotho and Ndebele (Nguni–speakers) with their earliest associated sites dating between the sixteenth and seventeenth centuries AD attested by early Moloko (Sotho/Tswana) pottery found in the shelters. Their earliest settlements are characterised by small villages in the valleys, which later developed into stone-walled enclosures situated on defensive hilltops (Huffman 2007). These settlements can, in many instances, be correlated with oral traditions on population movements during which African farming communities sought refuge in mountainous regions during the processes of disruption in the northern interior of South Africa resulting from the so-called difaqane.

With the arrival of the Langa Ndebele within the Mokopane area during the late eighteenth century, the capitals of the Langa rulers had almost always been in the general surroundings of the study area. From the early 1800s, the Langa capitals were positioned at hills within 10 km of the mine, namely at Moumong-wa-Matswake, Fothane Hill, Ditlotswane Hills, Maleoko Hill and Mogope Hill. In his book, *The Ndebele of Langa,* Jackson mentions the significance of rain-making activities for the Langa Chiefs in these hills and the fact that these rain-control sites were located in hidden and secluded spots and caves near their settlements (Jackson 1983). The decorated pottery (*Letaba* and *Waterberg* facies) found in the shelters can be associated with the Langa presence on the landscape. Today, the local communities still use the shelters in these hills as shrines of worship.

4.2.1.2.3 Rain Control (after Biemond 2019)

Overview of rain control during the Iron Age

Rain plays a very important role in African societies (Schapera 1953). Consequently, across southern Africa, there are many rituals associated with rain control. This desire to influence and control rain is vital in regions that lack adequate rainfall (Schapera 1937). In one example of this

importance, Tswana chiefs could not rule effectively without the ability to control the rain (Schapera 1971), while in less hierarchical societies, rain is often represented as an important animal, for example, in hunter-gatherer San cosmology.

Rain is commonly thought of as an animal living near a waterhole, and wherever this animal goes, so will the rain (Schapera 1930). The ethnographic record of hunter-gatherers and farmers of southern Africa includes many descriptions of rituals, beliefs, songs and references to rain control. Among hunter-gatherers, some of the most enduring features of rituals pertaining to rain control are the vast numbers of rock paintings and engravings preserved all over southern Africa. These rock art depictions are interpreted through insights gained from ethnographic sources. At the centre of these beliefs are ritual specialists, or 'shamans', who harnessed supernatural potency in order to enter the supernatural world to perform three main tasks: healing, controlling rain and influencing the movements of game (Lewis-Williams 1981).

A central aspect of many of the known San beliefs about rain control is that they involve a creature of some kind. Shamans are said to have captured a 'rain animal' and to have led it to areas affected by drought. The animal was then killed, and its blood and milk became precipitation. The rain was believed to store certain snakes near a watering hole. In fear of arousing their wrath, unmarried men and women may not consume them, and if they did, the snakes would chase away the rain (Schapera 1930). Rain was respected and even feared because it had the power to change people into animals or other objects, as well as to destroy with storms and terrible lightning. In addition, rain brings much-needed water and makes food grow (Schapera 1930; Bleek 1933).

A range of ethnographic sources emphasise that a complementary set of beliefs and rituals about rain control is present among southern African Farming Communities. When it did not rain, it was thought that God or the ancestors were angry (Stayt 1931). It was often the duty of the chief of a village to ensure rain (Stayt 1931; Schapera 1937). According to Schapera, all leaders possess special rainmaking medicines; among the Venda and the Northern Sotho, for example, the most important ingredients of this medicine are the body parts of deceased chiefs. Ethnographic accounts suggest that specific places, such as the graves of deceased chiefs, are used for rain control, as is the case amongst the Ndzundza Ndebele and Venda. Some Venda speakers also used hills, which have restricted access. Such places were off-limits to other members of the community, who were uninvolved in rain control rituals.

Rock shelters were also frequently used, and Tswana and Zulu rainmakers stored their medicines in small rock shelters. In addition, Tswana, Zulu, and Cape Nguni speakers used to go to pools to encounter the 'rain snake' (Schoeman 2006). The San also favoured hilltops and pools, and shamans would practise rain control in special places such as the Lizard Mountains in the Northern

Cape Province, where hills were used in rain control ceremonies and marked with rock art as a representation of these rituals (Deacon 1988). Many indications from ethnographic and archaeological sources indicate that farmers employed hunter-gatherers as ritual specialists. Payments typically included livestock and crops. Some groups of hunter-gatherers eventually lost their independence and came to rely on farmers economically, politically, socially and ritually.

Rain controllers were very selective about the places they used. Rain control hills had a connection to water, whether in the form of rock tanks on hilltops or of streams. The hills were also associated with caves, overhangs, shelters or boulder shelters. Sites where rain control rituals were performed in the past also have certain characteristics, such as the presence of natural cisterns or rock pools with steep sides (Schoeman 2006). Access to rain control sites is usually restrictive, with limited space for the passage of both people and livestock (Schoeman 2006). The use of specific hills with these features in rain control has great antiquity (Huffman 2009) and continued into the historic period (Schapera 1971). Even though rain control sites were not always necessarily inhabited, they have yielded ample material evidence, including house structures, grindstones, animal bones and pottery.

Iron Age settlement and rain control in the surroundings of the study area (after Biemond 2019)

It is important to note that this section discusses rain-control sites associated with the wider surroundings of the study area. However, it is important to note that none of the development footprints currently proposed are located near any of these known rain-control sites. As a result, the current footprints will have no impact on these sites.

The archaeological finds documented in the shelters and overhangs of hills located within the wider surroundings of the study area confirm the hills as prehistoric rain-control localities that would have played a highly significant role in the Iron Age communities of the arid landscape surrounding the study area. The presence of an entire sequence of ceramics identified in these shelters which include the *Doornkop* facies (AD 750 – AD 1000), *Eiland* facies (AD 1000 – AD 1300), *Icon* facies (AD 1300 – AD 1500), *Letaba* facies (AD 1600 – AD 1850) and *Waterberg* facies (AD 1750 – AD 1900) means that the rain-control activities at these sites could have been undertaken for a 1000 years or more.

A number of figures are provided below to illustrate some of the decorated potsherds observed in areas associated with rain control on the Motlhotlo Hills. Each of these figures illustrates potsherds from within the study area that can be associated with a particular ceramic facies.

Figure 14 - Doornkop facies pottery (Biemond, 2019: 4).

Figure 15 - Eiland facies pottery (Biemond, 2019: 4).

Figure 16 - Icon facies (Early Moloko) pottery (Biemond, 2019: 4).

Figure 17 - Waterberg facies pottery (Biemond, 2019: 4).

Figure 18 - Letaba facies cooking pot (Biemond, 2019: 4).

Figure 19 - Letaba facies pottery (Biemond, 2019: 4).

Apart from the rain-control sites found within the study area's wider surroundings, many stone-walled terraces were identified on and at the foot of hills from this area.

The terraces are spread out along the base of these hills, forming large settlements containing the remains of cattle kraals, houses, granaries and middens. The communal grain grinding areas have also been identified. These settlements could possibly be associated with the Langa Ndebele occupation of the landscape. At these settlements, important men, senior women and other family members of the chief were buried in the cattle kraals. Married women who had born children were buried in the household areas behind the main house. Children who had not yet reached puberty were buried in front of the house where they would normally play. Stillborns and babies who died shortly after birth were usually buried near or under the house in a ceramic pot.

4.2.2 Historical overview of the study area and surrounding landscape

The archival and desktop research of the history of the broader Mokopane region identified a number of historical aspects which can be associated with the surroundings of the study area. These historical facets will be discussed in more detail and in the chronological sequence below.

4.2.2.1 The Northern Transvaal Ndebele

The Ndebele-speaking people in the Mokopane and Polokwane regions (including the small Kekana group around Hammanskraal) were classified by Van Warmelo (1930) as the Northern Transvaal Ndebele. He also classified the local Ndebele into Northern Transvaal Ndebele and Southern Transvaal Ndebele on the basis of geographical location; the division roughly mirrored a cultural split between the two groups. Van Warmelo mapped the common descent of the Transvaal Ndebele from the original chiefdom under Musi and outlined the succession battle following Musi's death and the formation of several chiefdoms (Lekgoathi, 2009).

The study area and its surrounding landscape are strongly associated without, especially, two Late Iron Age / Historic agropastoralist groups, namely the Langa Ndebele and the Kekana Ndebele.

4.2.2.1.1 The Langa Ndebele

The Langa Ndebele originally lived in present-day Kwazulu-Natal and was associated with the extensive and powerful Hlubi kingdom. More than a century before the rise and expansion of the Zulu kingdom, the Langa Ndebele departed from present-day Kwazulu-Natal in c. 1650. Chief Masebe I most likely led this migration.

Their migration from present-day Kwazulu-Natal took many years. It is understood that one of the first settlements along their migration was within present-day Swaziland. From here, they moved to Ga-Maferera, on the Olifants River. The Langa Ndebele then migrated to Bošega, east of present-day Polokwane. Their closest neighbours at the time were the Matlala of the Matlala Mountains and the Kekana Ndebele of Chief Moletlane at present-day Zebediela. The Langa Ndebele stayed at Bošega for only a short period of time before moving to a hill located southeast of Polokwane known as Thaba Tšhweu. At Thaba Tšhweu, a number of the Langa Ndebele chiefs ruled and died, including Masebe I, Mapuso, Podile and Masebe II. This points to a relatively long occupation of the settlement.

While residing at Thaba Tšhweu, the Langa Ndebele adopted the Sotho custom of circumcision. Some scholars believe that it was the relatively nearby Matlala people who introduced circumcision to the Langa Ndebele. The first of their leaders to have been circumcised appears to have been Chief Podile. During this same period, the Langa Ndebele obtained the medicated pumpkin for their first fruits ceremony from the Kekana Ndebele of Moletlane. Similarly, it is believed that the Kekana Ndebele had to be notified by the Langa Ndebele before the latter Ndebele group could undertake initiation and form age-sets. These factors suggest that the Langa Ndebele were subject to the

Kekana Ndebele or that, as a minimum, they recognised the genealogical superiority of the Kekana Ndebele.

Masebe II was succeeded at Thaba Tšhweu as ruler by Chief Seritarita in c. 1775. Shortly after his succession, Seritarita led his people from Thaba Tšhweu to Maleoko on the present-day farm Bultongfontein 239 KR. This farm is located approximately 19.2km northwest of the closest point along the present study area. It is, therefore, clear that the arrival of the Langa Ndebele at Maleoko represented the first settlement of the Langa Ndebele in the general surroundings of the present study area.

Seritarita remained at Maleoko for approximately three years before moving with his people to Moumong-wa-Matswake, located on the present-day farm Zuid-Holland 773 LR. This settlement of Moumong-wa-Matswake was also known as Mokgokgong. The farm Zuid-Holland is located northeast of the farm Utrecht and is located approximately 33km northwest of the closest point along the present study area.

Seritarita lived at Moumong-wa-Matswake until his death and was succeeded by Chief Mapela, the son of his third-ranking wife. Seritarita's principal wife had no sons, whereas his son by his second-ranking wife, Makgenene (Mamaala), was not deemed fit to hold the office of the chief as he was believed to have deserted his father. Furthermore, it also appears that a *ngwetši* (daughter-in-law) was married to produce an heir on behalf of the principal wife. The *ngwetši* bore a son named Mosoge. While Mosoge, as the most senior of Seritarita descendants, was, therefore, to have become chief in time, this never happened. Some scholars believe that he was unfit to succeed and that he preferred to spend his time farming rather than to succeed as the ruler of the Langa Ndebele. Other scholars believe that by the time Mosoge was old enough to succeed, Mapela had entrenched his position as chief to such an extent that Mosoge couldn't take over the chieftainship from Mapela. In the end, during the Mfecane/Difiqane, Mosoga led his followers away from Moumong-wa-Matswake to settle at a small hill named Mabjanamatswana, immediately east of Thutlane and located some distance north and west of Moumong-wa-Matswake.

At the time of his 'desertion', Makgenene moved with his followers away from Moumong-wa-Matswake and settled at Tsotsodi, on the present-day farm Planknek 43 KS. This farm adjoins the farm that the study area is located on. Makgenene also lived at Segodini, situated on the present-day farm Makapansgat 39 KS. Their settlement at Segodini was ruled by three successive chiefs: Makgenene, Selepe and Mphunye (Mapunya). The farm Makapansgat is located approximately 10.7km east by northeast of the study area.

During the reign of Mapela, the Langa Ndebele experienced a growth period during which their

number and fame increased. During his reign, Mapela incorporated a number of smaller Sotho groups and clans, some voluntary and others by force. He also managed to defeat the Phalane Nareng of Mabuela and the Pedi of Matlou. These two groups had been settled along the Mogalakwena River for some time and had been unsuccessfully attacked by the Langa Ndebele even before they arrived at Moumong-wa-Matswake and before the succession of Mapela. It is interesting to note that a present-day settlement located some distance to the northwest bears the name Ga-Mabuela (i.e. the place of Mabuela). The Bibidi of Šongwane were also defeated during the reign of Mapela and fled to the Bobibidi hill near Villa Nora. Similarly, the Kwena of Ramorulane and the Hurutshe of Molokomme were defeated by Mapela's forces at Senta Hill and Swartkop. The Koni of Masenya and Puka, the Tlokwa of Pila and the followers of Tšhokwe joined the Langa Ndebele voluntarily during Mapela's reign.

During his old age, Mapela moved his capital from Moumong-wa-Matswake to Fothane Hill (Moordkoppie), where he died in 1825. Fothane Hill is located approximately 32km northwest of the study area. After Mapela's death, Mankopane, the son of Mapela's second-ranking son, Masekamiša, was earmarked to succeed. However, at the time, Mankopane was still too young and as a result, Maleya, Mapela's son from a lower-ranking wife, was appointed as chief. Chief Maleya ruled the Kekana Ndebele from his capital on the Ditlotswane Hills, located some distance from the study area.

Maleya proved to be an unpopular chief, and as soon as Mankopane was old enough to succeed, he ousted Maleya and became ruler of the Langa Ndebele. Mankopane's succession is believed to have taken place around 1835 or 1836.

After Mapela's death, the Mamaala group returned to the Langa Ndebele capital and claimed the chieftainship under their current leader, Mphunye. This was denied, and as indicated above, Mankopane succeeded Mapela as the chief of the Langa Ndebele. As a result, the Mamaala group planned to kill Mankopane, but without success.

During Chief Mankopane's reign, the Langa Ndebele attacked and defeated the Bibidi of Šongwane at their settlement, Bobididi, near Villa Nora. Villa Nora is located approximately 115km northwest of the present study area. The Langa Ndebele also attacked and scattered the copper miners of Musina, near the present-day town bearing the same name (Jackson 1983).

4.2.2.1.2 The Kekana Ndebele

The Kekana Ndebele group, which is associated specifically with the area around Mokopane and Zebediela, seems to be a sub-group of the so-called Northern Transvaal Ndebele (Bergh 1990)

(Skhosana 2010). Skhosana (2010) references Van Warmelo (1930) and other scholars who subscribe to the view that the so-called Southern and Northern Ndebele of South Africa constitute a single ethnic group that claims its origin from the ancestral chief, Musi (or Msi). According to these scholars, the Ndebele originated from KwaZulu-Natal. They originally split from the main Hlubi group c. 1552 under the chieftainship of Mafana and subsequently travelled northwards.

The AmaNdebele crossed the Vaal River, entered what is today known as Gauteng, and initially settled around eMhlangeni (present-day Randfontein) on the western side of Johannesburg. From eMhlangeni, they moved to KwaMnyamana near Pretoria and arrived there in 1610. At KwaMnyamana, the AmaNdebele were under the chieftainship of Musi who, according to Van Warmelo (1930), had either five or six sons, namely Manala, Nzunza (or Ndzundza), Mhwaduba, Dlomu, Mthombeni and Siobasa or M'pafuli (or Mphafudi).

Historically, KwaMnyamana is considered to be an important settlement of the AmaNdebele of the Republic of South Africa because it is the place where the AmaNdebele split into two main groups and numerous smaller sub-groups. When Musi died in 1630, a succession struggle between two of his sons, namely Manala and Nzunza (or Ndzundza), resulted in them splitting into the Southern and Northern Ndebele, respectively, as well as into other smaller groups. The Southern Ndebele comprised the followers of Manala and Nzunza, while the Northern Ndebele consisted of the followers of Mthombeni. Together with his brother, Nzunza (or Ndzundza), Mthombeni left KwaMnyamana and travelled to KwaSimkhulu, north of Belfast in the present Mpumalanga Province. At KwaSimkhulu, Mthombeni parted ways with Nzunza (or Ndzundza) and moved northwards along the Olifants River until he reached the area around Zebediela. On his way northwards, Chief Mthombeni became known as Gegana (or Kekana) and his followers were referred to as the 'people of Gegana (or Kekana)' instead of remaining the 'people of Mthombeni'. In explaining how Mthombeni changed his name to Gegana (or Kekana), De Beer (cited in Skhosana, 2010) states that, "*Die naam Gegana is afgelei van die Noord-Ndebele woord, kugega, wat beteken om saam met of parallel met iets te beweeg en verwys na die feit dat Mthombeni en sy volgelinge in hulle noordwaartse migrasie al langs die Olifantsrivier op beweeg het. Daarom word daar ook na hulle verwys as Gegana nomlambo, dit wil se die Gegana wat met die revier (mulambo) opgetrek het*."

Bergh (1990) states that the Kekana Ndebele (Mathombeni/Yangalala) settled southeast of Mokopane at Moletlane. According to him, this community had earlier split from the Ndzundza group. A further split within the Kekana community occurred when the Vaaltyn-Kekana established a separate community closer to the present-day town of Mokopane. This group was known as the Kekana Ndebele of Chief Mugombhane (who was also known as Sejwamadi, Mokopane and Makapane) (Bergh, 1999).

4.2.2.2 Arrival and settlement of the Voortrekkers and the establishment of Potgietersrus

The Historical Period within the study area and surroundings commenced with the arrival of newcomers to this area. The first arrivals would almost certainly have been travellers, traders, missionaries, hunters and fortune seekers. However, with time, this initial trickle was replaced by a flood of white immigrants during the 1830s, when mass migration of roughly 2 540 Afrikaner families (comprising approximately 12 000 individuals) from the frontier zone of the Cape Colony to the interior of Southern Africa took place. The people who took part in this Great Trek were named Voortrekkers (those who travelled ahead) and formed part of the first mass movement of whites into the interior of Southern Africa (Visagie, 2011). The reasons behind this migration are complex, but in general, terms include aspects such as a general discontent with the British authorities and the way in which they dealt with various aspects on the frontier.

In 1836, two pathfinding parties under the leadership of Louis Tregardt and Johannes Jacobus Janse (Lang Hans) van Rensburg passed the outskirts of present-day Heidelberg in a northward direction. While the exact route followed by these Voortrekkers is not always equally clear, Bergh (1999) and others contend that they followed the Olifants River (or alternatively followed a route a short distance west of the river) before passing through a poort in the Strydpoort Mountains. These mountains are located approximately 18.9km southeast of the study area.

However, at the Strydpoort Mountains, the two parties separated, apparently due to differences of opinion the two trek leaders held regarding the purpose of the expedition. Van Rensburg was anxious to reach Lourenço Marques to replenish his store of ammunition (for ivory hunting), while Tregardt was in favour of reaching the Zoutpansberg Mountains, now only seventy miles away. Van Rensburg's party separated from Tregardt's, and they never saw each other again. The place where they parted ways has since become known as the Strydpoort—the Pass of the Quarrel (Ransford, 1968). After the separation of the two Voortrekker parties, Louis Tregardt continued northward and passed the present-day town of Polokwane before reaching the Soutpansberg. He eventually reached Delagoa Bay, where Louis Tregardt and many of his party died of malaria (Ransford. 1968). The Van Rensburg trek met a violent end in present-day Mozambique when they were attacked, and the entire party (except for two children) was massacred at the end of July 1836 by an impi of Manukosi (Potgieter et al. (1970); Wallis (2002).

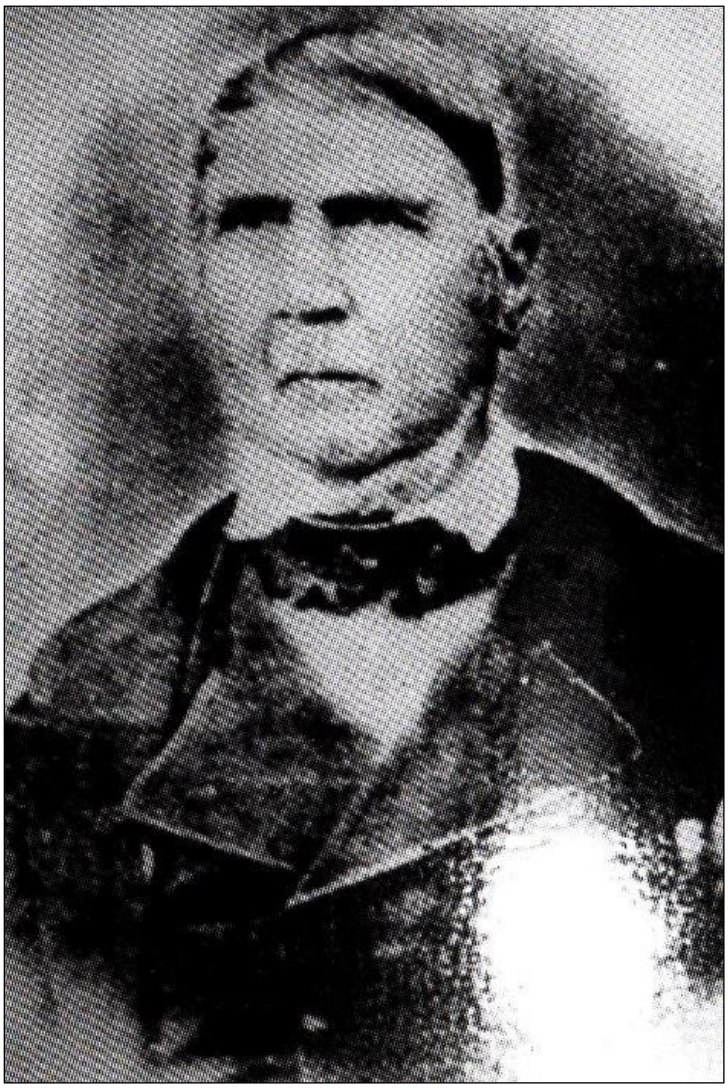

Figure 20 – Voortrekker leader Louis Tregardt (Visagie, 2011:500).

With time, other Voortrekker parties followed and in 1846, the Voortrekker town of Andries Orieg Stad (Ohrigstad) was established. The original Voortrekker town had a short existence, and by 1849, most of its residents had moved to the newly established Voortrekker towns of Schoemansdal (along the Soutpansberg Mountains) and Lydenburg (Changuion 1986).

On 16 January 1852 the Sand River Convention was signed between the British Government and the Transvaal Boers. This convention formally recognised the existence and independence of the Boer Republic north of the Vaal River by the British Government. As a result, this agreement allowed for the creation of a Boer Republic, namely the *Zuid-Afrikaansche Republiek* (South African Republic) (Oberholster, 1972).

The constitution of the newly established *Zuid-Afrikaansche Republiek* stated that each burger who

had established himself within the republic before 1852 could choose and receive two farms of roughly 3,000 morgen each. Those burgers who arrived after 1852 could only obtain one such farm and had to pay an amount of 10 shillings for it annually. The initial settlement and concentration of Voortrekkers tended to be along the Mooi River (near present-day Potchefstroom), Magaliesberg Mountains (near the present-day towns of Pretoria and Rustenburg) and Lydenburg areas. However, the establishment of farms by the Voortrekkers in the surroundings of the study area appears to have been isolated and sporadic during these early years, with some settlement only taking place during the 1850s and early 1860s (Bergh 1999).

On 19 March 1852, the Volksraad of the newly established *Zuid-Afrikaansche Republiek* approved the establishment of a town named Vredeburg in the Makanspoort area. Vredeburg was, however, never established (Bergh 1999).

4.2.2.3 Moordkoppie, Moorddrift and Pruizen

In September 1854, three events took place in the surroundings of the study area, which profoundly impacted the history and characteristics of the surrounding landscape. Moordkoppie, Moorddrift and Pruizen, the scenes of these events, would echo in the combined memory of both white and black residents of these parts for years to come. One of these places, namely Moorddrift, would be proclaimed a National Monument in 1940, and a monument commemorating the victims of all three events was erected in Potgietersrus (present-day Mokopane) in 1909. The events associated with especially Moorddrift and Pruizen also led to a battle and siege, which was to become synonymous with the town of Mokopane to this day, namely Makapan's Caves. Makapan's Caves were declared a National Monument in 1938 (Bergh 1999).

During late September 1854, the Langa Ndebele of Mankopane and Kekana Ndebele of Mokopane attacked three groups of Voortrekkers. A total of 28 Voortrekkers were killed during these attacks, including 14 men whom the Langa Ndebele killed near their capital at Fothane Hill (Moordkoppie), a party of 12 men, women and children killed at Moorddrift by the Kekana Ndebele, and two men killed at the capital of the Kekana Ndebele on the farm Pruizen.

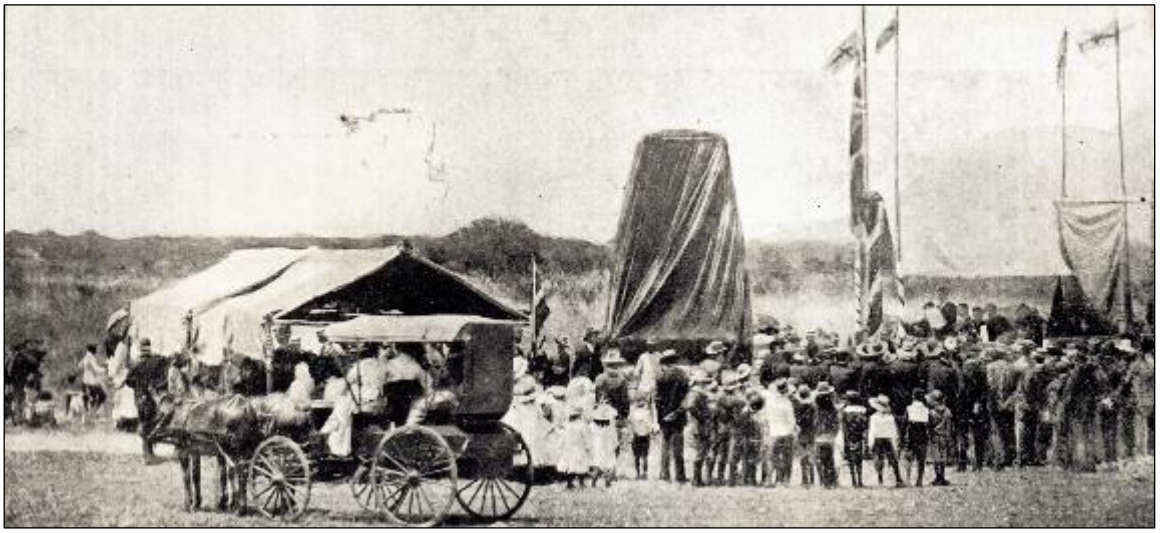

Figure 21 – Historic photograph depicting the unveiling of the memorial to the Voortrekkers who had lost their lives at Moordkoppie, Moorddrift and Pruizen. This monument was erected and unveiled in the square adjacent to the town hall of Potgietersrus in 1909 (Combrink 1954:18). Incidentally, this monument is currently located 2.5km northwest of the present study area.

The attack at Fothane Hill (Moordkoppie) was first, and those killed included Voortrekker leader Andries Hendrik Potgieter's younger brother Hermanus Philippus Potgieter. The attacks at Moorddrift and Pruizen took place the following day. The three attacks taking place in such a short period of time by two different, though neighbouring Ndebele groups, suggest that the attacks were orchestrated and planned beforehand (Jackson 1983). The reasons for the Ndebele attacks on the three Voortrekker parties are explained by Dr Alex Schoeman of the University of the Witwatersrand as follows: "*Tension between the Ndebele and the Trekkers had been mounting for a number of years prior to the siege. This hostility was fuelled by the Trekkers' interest in the territory of the Kekana and Langa Ndebele because of its strategic importance as a route to the ivory-rich northern Transvaal (now Limpopo Province). In 1852 Commandant-General A.H. Potgieter intended to establish a town (De Vaal 1990: 140) in the Makapanspoort to lay claim to the route and facilitate the movement of goods and people between Schoemansdal and the Magaliesberg (Rustenburg). His objectives remained unrealized because he fell ill and died in December the same year (De Vaal 1990: 140). By 1854 the Kekana, who had fallen repeatedly victim to Trekker raids, demands and various acts of cruelty under the leadership of the Potgieters, joined a growing network of resistance against the Trekkers. In 1854 the Trekkers, who were also finding it increasingly difficult to exert their control over Sekwati's Pedi (Delius & Trapido 1983: 62), shifted their trade route from the Strydpoort to the Makapanspoort (Potgieter 1958: 3), and in doing so triggered a cycle of violence and resistance between themselves and the Ndebele."* (Schoeman 2010:67).

When news of the attacks reached Commandant-General Piet Potgieter at his farm near present-day Modimolle, he called up a commando. Within a relatively short period, his commando

numbered 150 men from essentially the Schoemansdal (Zoutpansberg) Voortrekkers. However, he realised that more men were required and requested the assistance of Commandant-General Marthinus Wessel Pretorius of the Magaliesberg (Rustenburg) Voortrekkers. The news of the attacks reached Pretorius on 25 September 1854, and he immediately started calling up his men. By 14 October 1854, his commando numbered 334 men, with whom he proceeded northwards to assist Commandant-General Piet Potgieter. For reasons not presently clear, the combined Voortrekker force of nearly 500 men ignored the Langa Ndebele and proceeded to attack the Kekane Ndebele of Mokopane at their defensive stronghold known today as Makapan's Caves. The Voortrekkers placed the cave under siege, which lasted from 25 October to 21 November 1854. By the end of the siege, nearly 2 000 members of the Kekana Ndebele had lost their lives (Jackson 1983), with Schoeman (2010) stating that several Ndebele women and children were also captured during the siege. On the Voortrekker side, Naidoo (1987) indicates that two Voortrekkers lost their lives, and several were wounded. One of the Voortrekkers who died during the siege was Commandant-General Piet Potgieter. His name was commemorated in the naming of the nearby town established in September 1858, namely Piet Potgietersrust.

After the siege, the Voortrekkers proceeded to Fothane Hill to attack the Langa Ndebele. However, fearing reprisals from the Voortrekkers, Mankopane and his Langa Ndebele had fled from Fothane Hill to a flat-topped and steep-sided mountain named Magagamatala on the present-day farm Ruigtevley 710 LR, which is located approximately 74km north-west of the present study area.

Pruizen and Moorddrift were the closest of the three attacks of September 1854 to the present study area. The farm Pruissen 48 KS is located 4.9km south of the present study area, whereas the site of Moorddrift is located 9.8km southwest of the study area.

4.2.2.4 Establishment of Piet Potgietersrust and the conflict between the Langa Ndebele and the Transvaal Republic

In September 1858, the Volskraad approved the establishment of a new town that was to be named Piet Potgietersrust in honour of Commandant-General Piet Potgieter (the son of Commandant-General Andries Hendrik Potgieter), who was killed during the siege of Mokopane (see section above). In December 1860, Commandant-General Stephanus Schoeman announced that the laying out of the town would commence on 10 December 1860. Work on the development of the town proceeded slowly, and by 21 January 1861, only a water furrow had been dug. By September 1862, however, a number of residents had settled down in the newly established town (Bergh 1999).

The establishment and early existence of the town of Piet Potgietersrust became synonymous with the conflict between the Langa Ndebele of Chief Mankopane and the Transvaal Republic. The first

serious battle between the two groups took place on 14 April 1858, when in retaliation for incursions and attacks by Mankopane's men, his mountain stronghold named Magagmatala was attacked by a force commanded by Commandant-General Stephanus Schoeman. During the attack, the later President of the *Zuid-Afrikaansche Republiek,* Commandant S.J.P. (Paul) Kruger, played a crucial role, and the Langa Ndebele suffered a devastating defeat. In the words of Jackson (1983:18), "…*it is said that some 800 of Mankopane's subjects were killed that night*." As a result of the attack of 14 April 1858, Mankopane moved his capital to Thutlwane Hill on the farm Kromkloof 744 LR. Thutlwane is located approximately 57.4km northwest of the present study area (Jackson 1983).

In January 1868, the town of Piet Potgietersrust was attacked by the Kekana Ndebele of Mogemi, who acted as regent for Mokopane II. Mankopane's Langa Ndebele supported his attack. The increasing conflict between the two sides came to a head on 2 March 1868, when a Boer Commando commanded by Commandant Paul Kruger laid siege to Mogemi and his followers at Sefakaulo Hill near Piet Potgietersrust. This hill is located 9km northwest of the study area. In the time that Sefakaulo Hill was under siege, Mankopane's men raided a number of farms in the surroundings of the town. Realising the threat posed by Mankopane and concluding that he did not have the manpower to force Mogemi's surrender, Kruger decided to rather attack Mankopane at Thutlwane. This attack started on 13 June 1868 and continued for a couple of days. Although Kruger's force managed to occupy most of the mountain stronghold at Thutlwane, Chief Mankopane eventually proved victorious in the battle and forced Commandant Kruger, who by now was running low on ammunition and supplies, to order his men back to Piet Potgietersrust (Jackson 1983).

A peace accord between the Boers and the Langa Ndebele was eventually agreed upon on 6 July 1869. However, this provided little stimulus for the growth and development of Piet Potgietersrust. By 1870, the entire white population of town had been evacuated *inter alia* due to the effects of Malaria. The evacuation and abandonment of the town continued from 1870 until 1890 when Piet Potgietersust was re-occupied (Bergh 1999).

On 30 May 1877, a few years after the evacuation of the white population of Piet Potgietersrust, Chief Mankopane passed away at Thutlwane. He was buried here the following day, and his son Masebe succeeded as chief of the Langa Ndebele on 3 June 1877 (Jackson 1983).

Figure 22 – Historic photograph of various chiefs from the then Zoutpansberg District who were called to a meeting in Pretoria with Captain Oscar Dahl in August 1881. Chief Masebe of the Langa Ndebele is standing behind Dahl and to his right, with Chief Mokopane II of the Kekana Ndebele standing left of Dahl (De V. Pienaar, 1990:166).

Between 1883 and 1886, a war raged between the Langa Ndebele of Masebe and the Kekana Ndebele of Mokopane II. While the exact localities for the various events associated with this war are unknown, at least one of the battles appears to have occurred along the Mogalakwena River. On this occasion, Masebe's forces slept at Fothane Hill (Moordkoppie) the night before the battle. The war came to an end when State President Paul Kruger visited these parts and ordered Masebe and Mokopane II to appear before him, upon which he insisted that they make peace (Jackson 1983).

From 1890 onwards, and under the leadership of Commandant Henning Pretorius, the town was of Piet Potgietersrus developed and expanded (Bergh 1999).

4.2.2.5 Establishment of 'native locations' in the surroundings of the study area

After the dramatic defeat of the British forces to those of the Boers at the Battle of Majuba on 27 February 1881, the First Boer War (also known as the Transvaal War of Independence) ended. The formal peace agreement between the British and Boer sides was signed on 5 April 1881 in

Pretoria and became known as the Pretoria Convention. The agreement was ratified by the Transvaal Volksraad on 3 August 1881 and was superseded by the London Convention of 1884.

Three sections from the Pretoria Convention are of importance for the present study. These sections are provided verbatim below and deal with the creation of a so-called 'Native Location Commission', which had to reserve or proclaim defined locations within the Transvaal Republic for the various black groups who lived within its borders. The three sections are quoted verbatim below:

XIII. Natives will be allowed to acquire land, but the grant or transfer of such land will in every case be made to, and registered in the name of, the Native Location Commission, hereinafter mentioned, in trust for such natives.

XXI. Forthwith, after the taking effect of this Convention, a Native Location Commission will be constituted, consisting of the President (or in his absence the Vice-President) of the State, or some one deputed by him, the Resident, or some one deputed by him, and a third person to be agreed upon by the President (or the Vice-president, as the case may be) and the Resident; and such Commission will be a standing body for the performance of the duties hereinafter mentioned.

XXII. The Native Location Commission will reserve to the native tribes of the State such locations as they may be fairly and equitably entitled to, due regard being had to the actual occupation of such tribes. The Native Location Commission will clearly define the boundaries of such locations, and for that purpose will, in every instance, first of all ascertain the wishes of the parties interested in such land. In case land already granted in individual titles shall be required for the purpose of any location, the owners will receive such compensation, either in other land or in money, as the Volksraad shall determine. After the boundaries of any location have been fixed no fresh grant of land within such location will be made, nor will the boundaries be altered without the consent of the Location Commission. No fresh grants of land will be made in the districts of Waterberg, Zoutpansberg, and Lijdenberg, until the locations in the said districts respectively shall have been defined by the said Commission (www.sahistory.org.za).

The Transvaal Location Commission, as it is sometimes referred to, existed between 1881 and the outbreak of hostilities during the South African War in 1899. Initially, its members were Paul Kruger (Vice-President of the *Zuid-Afrikaansche Republiek*), George Hudson (British Resident in the Transvaal Republic) and H.J. Schoeman. Later, Kruger was replaced by the Superintendent of Native Affairs, General P.J. (Piet) Joubert, with Fritz Stiemens as the Commission Secretary. After the Pretoria Convention was replaced by the London Convention in 1884, the members of the commission also changed. By 1891, the work of the commission was replaced by a meeting that was called in every district of the Transvaal Republic and which was attended by the relevant

district's magistrate, commandant, and field-cornets (Bergh 1999).

Figure 23 – Historic photograph of a meeting between an official of the Transvaal Republic and a person believed to be Chief Mugombhane of the Kekana Ndebele (Cartwright & Cowan 1978:10)

In May 1882, shortly after the adoption of the Pretoria Convention, the Executive Council of the *Zuid-Afrikaansche Republiek* was instructed by the Location Commission to already decide which black groups would be allocated locations. Only 17 black groups were included in this initial list, and in terms of the surroundings of the present study area, this list included the Langa Ndebele as well as the Kekana Ndebele of Mugombhane (Makapan) (Bergh 1999).

On 26 May 1890, the Location Commission visited Potgietersrus and found that Chief Mugombhane had passed away a few months before. As a result, the commission met and negotiated with the regent Ntala (known to the commission members as Willem Makapan). The Location Commission proceeded to demarcate the farms Makalakaskop 2324, Knapdaar 1548 (portion), Tweefontein 1033 (portion), Rietfontein 1562, Turfspruit 2323 and Pietpotgietersrust 2247 (portion) as a location for the Kekana Ndebele. In January 1894, the Location Commission declared that the Mogalakwena River would define the south-western boundary of the reservation, through which small sections of the following farms were added to the reservation: De Hoogedoorn 706, Blinkwater 707 and Lisbon 2366. At the same time, the portion of the farm Pietpotgietersrust 2247 that was originally included was now excluded from the reservation (Bergh, 1999).

The Location Commission visited the Langa Ndebele between 10 and 13 June 1890. However,

they found that Chief Masebe, who had succeeded Mankopane in 1877, had passed away in May 1890, and a succession dispute was underway between his sons Hans and Backenberg Masebe. This resulted in the partitioning of the area set aside for the Langa Ndebele, with one section falling under Hans Masebe and the other Backenberg Masebe. These two sections adjoined each other and comprised the following farms: Van Dykspan (possible Van Wykspan 589) (portion), Haakdoorndraai 661, Hel en Bricksteen 2102, Elandsfontein 594 (portion), Goedehoop 928 (portion), Malokong 2114, Vogelstruisfontein 593 (portion), Schoonoord 1610, Vliegekraal 2250, Vriesland 1704, Groningen 1349, Bellevue 1705 (portion), Moordkop 1528, Molendraai 1546 (portion), Zwartfontein 1542 (portion), Commandodrift 1609 (portion), Gezond 1535, Zandsloot 1526 and Knapdaar 1548 (portion). By 1904, the following farms had been added to the location: Malakongskop 1332, Mozambique 1336 (portion) and Inhambane 1335. The following farms had been excluded by 1904: Van Dykspan (possibly Van Wykspan 589), Elandsfontein 594 and Goedehoop 928. The farm Haakdoorndraai 661 was bought by Backenberg Masebe and added to his property. Similarly, the farm Drenthe 2314 was bought by Hans Masebe and added to his property (Bergh, 1999).

4.2.2.6 From Location to Lebowa: the study area and surroundings from c. 1890 into the Twentieth Century

The partition of the Langa Ndebele into sections falling under the two sons of Mapela profoundly impacted this Nguni group. The southern section of the overall location that was allocated to the Langa Ndebele in 1890 was established as the land of Chief Hans Masibi and his followers, whereas the northern section of the location was given to Chief Backenberg Masibi. Incidentally, the southern section included Fothane Hill, where the old capital of Chief Mapela was once located. As a result, this southern chiefdom became known as *ba ga Mapela* (those of Mapela's place) (Jackson 1983).

Jackson (1983:39) makes the following interesting comment regarding the composition of the two partitioned Langa Ndebele groups. He states that "…*almost all the Sotho subjects of the Langa supported Hans, whereas the majority of the Langa clansmen supported Bakenberg. In this way, the chiefdom that went to Hans comprised a high percentage of people of alien (mainly Sotho) stock and a small percentage of Langa clansmen*."

With the partition of the Langa Ndebele, Chief Hans Masibi moved his capital from his father's seat of residence at Thutlwane to the eastern foot of Mogope Hill. Mogope Hill is located approximately 31.5km northwest of the present study area, and the Mapela capital was situated here from 1890 to 1957 (Jackson 1983).

The years of the partition saw conflict between the Mapela on the one side and followers of Chief Backenberg Masibi on the other. Raids and attacks were undertaken from both sides during these years and lasted until April 1901, when the British Army occupied Pietersburg (present-day Polokwane) and ordered the two chiefs to stop fighting. During the period of war and bloodshed associated with the partition, Chief Hans Masibi had four of his uncles, who had supported his brother's succession, shot at Raphaga Hill. This event took place in 1900.

Figure 24 - Chief Hans Masibi, the ruler of the Langa Ndebele and Mapela from 1890 to 1905 (Jackson 1983:38).

After the death of Chief Hans Masibi on 29 November 1905, his uterine brother Marcus Masibi was appointed as regent. On 8 August 1913, the farm Zwartfontein 818 LR was registered in the name of Chief Marcus in trust for the Mapela people. The farm was purchased by the people of Mapela (Jackson 1983).

The Mapela chiefdom purchased the farms Bavaria 678 LR, Blinkwater 680 LR and Scirappes 681

LR in 1926. The funds for the purchase of the three farms came from the sale of the mineral rights of the farm Zwartfontein 818 LR, where platinum had been mined for some time (Jackson 1983). The present study area includes a section of this farm.

In 1941, during the reign of Nkgalabe Johannes Masibi, the farms Blinkwater 820 LR, Leyden 804 LR, Overysel 815 LR and Vaalkop 819 LR, which the South African Development Trust had purchased, were transferred to the Mapela in exchange for three farms, namely Bavaria, Blinkwater and Scirapps (Jackson 1983).

The apartheid-created bantustan or “homeland” of Lebowa was given internal self-government on 2 October 1972, with its capital initially at Seshego and later at Lebowakgomo (Bergh 1999). In 1994, all the former Bantustans were fully incorporated into South Africa again.

4.2.3 Historical Maps

The examination of historical data and cartographic resources represents a critical tool for locating and identifying heritage resources and in determining the historical and cultural context of the study area. Relevant topographic maps were studied to identify structures, possible burial grounds or archaeological sites present in the footprint area.

The first and second editions of the historical topographic maps were used for this study. The study area boundaries were overlain on the map sheets to identify any possible heritage features (such as structures or graves) situated within or immediately adjacent to the study area boundaries.

- A section of the First Edition of the 2429AA Topographical Map Sheet is depicted in **Figure 25**Error! Reference source not found. below. This sheet was based on aerial photography undertaken in 1963, was surveyed in 1968 and drawn in 1969 by the Trigonometrical Survey Office. Using the overlay function of Google Earth, an overlay was made of the study area over this topographic sheet.

  No possible heritage features are depicted within or in proximity to the study area as depicted on this map. A digging or excavation is depicted where the Mokopane landfill is currently located.

- A section of the Second Edition of the 2429AA Topographical Map Sheet is depicted in **Figure 26***Error! Reference source not found.* below. This sheet was surveyed in 1981 and drawn by the Trigonometrical Survey Office. Using the overlay function of Google Earth, an overlay was made of the study area over this topographic sheet.

No possible heritage features are depicted within or in proximity to the study area as depicted on this map. A digging or excavation is depicted where the Mokopane landfill is currently located.

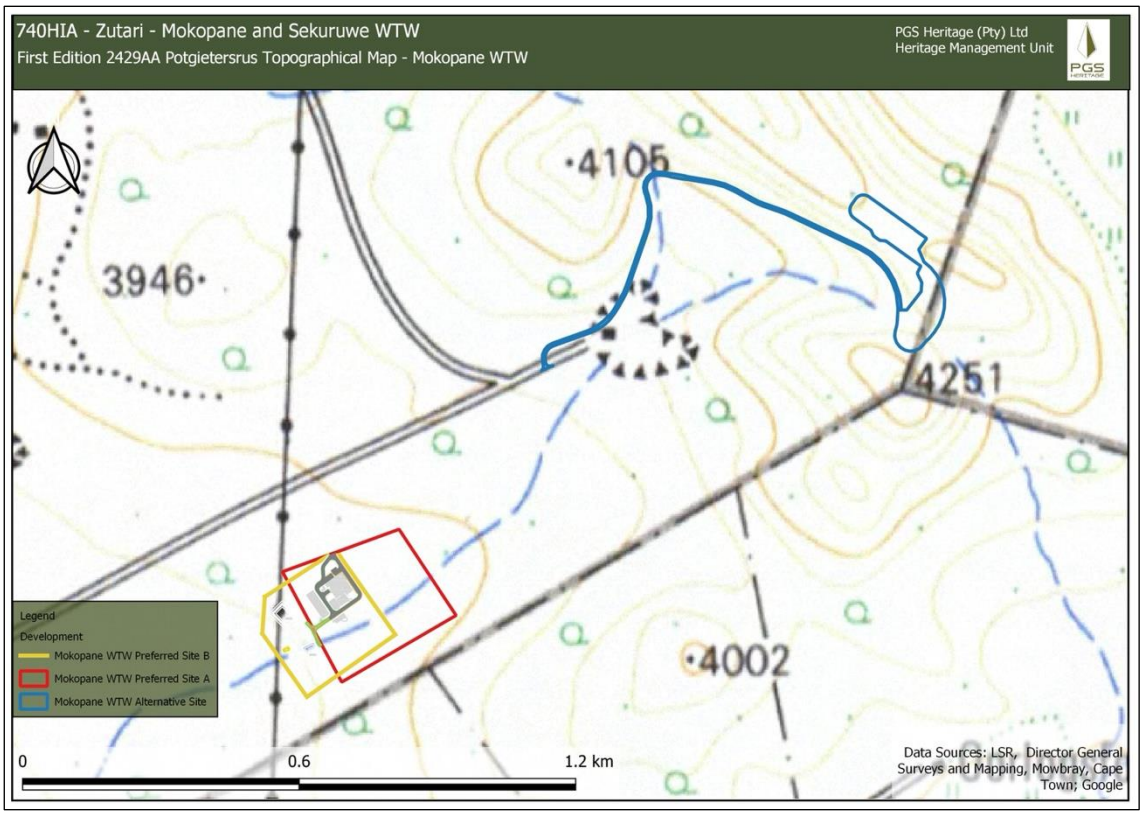

Figure 25 – Overlay of the study area boundaries over a section of the First Edition of the 2429AA Topographic Map that was surveyed in 1968.

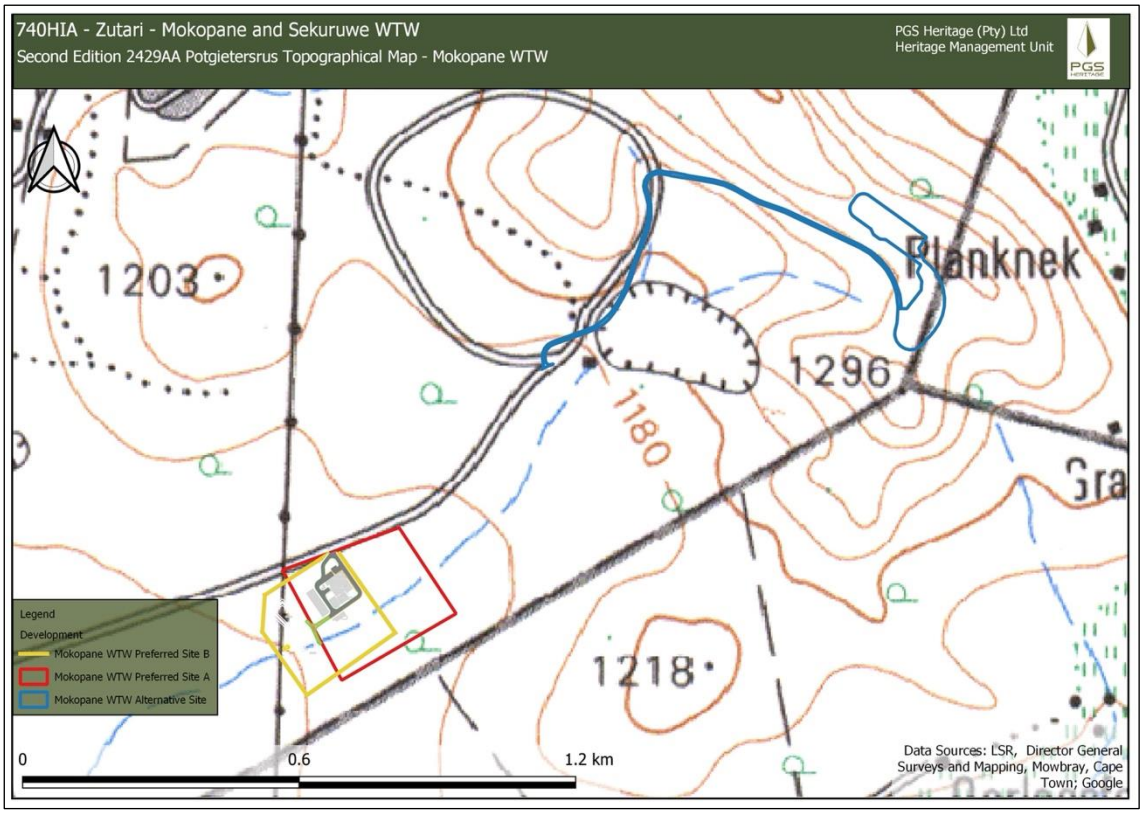

Figure 26 - Overlay of the study area boundaries over a section of the Section Edition of the 2429AA Topographic Map that was surveyed in 1981.

4.2.4 Previous heritage impact assessment reports from the study area and surroundings

An assessment of the South African Heritage Resources Information System (SAHRIS) of SAHRA was undertaken, which revealed that several previous archaeological and heritage impact assessments had been undertaken in the surroundings of the study area.

All these previous studies located on the SAHRIS system will be briefly discussed in chronological order below. In each case, the results of each study are shown in bold.

- PISTORIUS. J. C. 2002. A cultural heritage impact assessment for the proposed new open pit for PRust on the farm Zwartfontein 818lr in the Northern Province of South Africa. Amendment to the PRust Environmental Management Programme Report (EMPR). **Heritage resources consisting of the ruins of dwellings and old abandoned mines were discovered in and near the proposed new open pit area. Six sites with graves and the ruins of dwellings dating from the relatively recent past also occur in and near the open pit area.**

- ROODT, F. 2008a. Phase 1 Heritage Scoping Report Mogalakwena Bulk Water Supply Scheme – Phase 1 of Zone 1 Mokopane: Limpopo. **Five (5) burial grounds with graves and a low-density scatter Middle Stone Age site were identified.**

- ROODT, F. 2008b. Phase 1 Heritage Impact Assessment: Delagoa Eco-Estate Development Mokopane, Limpopo. **No heritage resources were identified in this assessment.**

- GAIGER, S. 2009. Heritage Impact Assessment for the proposed Mokopane Residential Golf Estate, Mokopane, Limpopo Province. **No heritage resources were identified in this assessment.**

- PISTORIUS, J. C.C. 2009. A Phase 1 Heritage Impact Assessment (HIA) Study for Eskom's Proposed Mokopane Integration Project near Lephalale and Mokopane in the Limpopo Province. **No heritage resources were identified in this assessment.**

- COETZEE, F.P. 2011. Cultural Heritage Survey of the Proposed Provincial Road Deviation (P4380) Project for the Mogalakwena Platinum Mine, near Mokopane, Mogalakwena Municipality, Limpopo Province. **Several historical structures and burial grounds were uncovered in this assessment.**

- HUTTEN, M. 2011. Heritage Impact Assessment for the Proposed Mokopane Solar Park in Piet Potgietersrust Extension 6 in Mokopane, Limpopo Province. **No heritage resources were identified in this assessment.**

- MURIMBIKA, E. 2012. Proposed Eskom Platreef Power Line and Substation Project within Mogalakwena Local Municipality, Waterberg District in Limpopo Province: Archaeological and Heritage Impact Assessment Report. **Low significance historical homestead remains, as well as several burial grounds, were uncovered in this assessment.**

- ROODT, F. 2012. Phase 1 Heritage Resource Impact Assessment (Scoping & Evaluation): Maruteng Waste Water Treatment Works Mokopane, Limpopo. **No heritage resources were identified in this assessment.**

- HUTTEN, M. 2013. Proposed Water Supply Infrastructure for the Residential Clusters of Tshamahansi, Sekuruwe, Seema, Phafola, Maala Perekisi, Witrivier and Millennium Park in the Mogalakwena Local Municipality, Waterberg District, Limpopo Province. **A living heritage site was uncovered in this assessment.**

- HUTTEN, M. 2014. Proposed Development of a Shopping Centre on Portion 1 of the Farm Kroonstad 468 LR, west of Marken in the Mogalakwena Local Municipality, Waterberg District, Limpopo Province. **No heritage resources were uncovered in this assessment.**

- VAN DER WALT, J. 2014. AIA Report for the Proposed Water Supply Pipeline Linking Existing Pipelines at the Percy Fyfe Y-Junction and the Mokopane High Reservoir, Limpopo Province. **One (1) archaeological site was identified with a low-density scatter of decorated and undecorated ceramics.**

- VAN DER WALT, J. 2016. Archaeological Impact Assessment for the Proposed Bulk Water Supply Pipelines from Pruissen to Piet-Se-Kop Reservoir, as Part of the Mogalakwena Water Master Plan, Mogalakwena Municipality Area, Limpopo Province. **Low significance Iron Age remains as well as some MSA stone tool scatters were uncovered in this assessment.**

- ROODT, F. 2017. Proposed filling station and shopping complex at Bakenberg. Mogalakwena Local Municipality. Waterberg District. Limpopo Province. **This assessment uncovered a stone-walled settlement of the Langa Ndebele just outside of the proposed study area. This stonewalled site is located on top of Basogadi Hill, just outside of Bakenberg. The site exhibits the typical stone-walled settlement pattern for the area, and according to local residents, the site is ancestral to the Langa Ndebele.**

- VAN SCHALKWYK, J. 2017. Phase 1 Cultural Heritage Impact Assessment: the proposed development of the Mogalakwena Mini Water Scheme Pipeline, Waterberg District Municipality, Limpopo Province. **Scattered surface occurrences of Middle Stone Age stone tools and flakes were identified in a few areas across the pipeline route, four graves, and the remains of old homesteads.**

- ROOTMAN, F. & STEGMAN, L. 2017. Phase 1 Heritage Resources Scoping Report Proposed Establishment of a Borrow Pit (0) to Surface New 11 on the farm Planknek 43 KS Portion 0 (Rem), Mokopane, Limpopo. **No heritage resources were identified in this assessment.**
- VAN DER WALT, J. 2017a. Heritage Impact Assessment (Required under Section 38(8) of the NHRA (No. 25 of 1999) Mogalakwena Municipality Water Master Plan: Phase 2A Bulk Water Supply Zone 1, Waterberg District Municipality, Limpopo Province. **Middle Stone Age stone tool scatters, Late Iron Age structural remains, historical stone-**

walled structural remains and several burial grounds were uncovered in this assessment.

- VAN DER WALT, J. 2017b. Heritage Impact Assessment for the proposed water supply pipelines and associated infrastructure, as part of the Mogalakwena Water Master Plan, Mokopane Area, Waterberg District Municipality. **During the survey, Iron Age Scatters (FS 1 and 2), stone-walled enclosures (MIW 4 and 5) as well as three grave/ burial sites (MIW 1-3) were recorded.**

- GAIGHER, S. 2018. Phase 1 Heritage Resource Impact Assessment Report. Heritage Impact Assessment for the proposed upgrade and renovations of the original sandstone building at the Mokpane Police Station, Mokopane, in the Mogalakwena Municipality, Waterberg District of the Limpopo Province. **One heritage resource was identified, namely a historic building at the Mokopane Police Station.**

- BIRKHOLTZ, P. AND SMEYATSKY, I. 2019. Heritage Impact Assessment for the Mogalakwena Mine Expansion Project near Mokopane, Limpopo Province. **The fieldwork resulted in the identification of a total of seventy-one (71) archaeological and heritage sites. Eleven sites containing confirmed graves and burial grounds, four sites containing possible graves, two sites containing relocated burial grounds which may still contain graves, twenty-eight black homesteads, one historic farmstead, twelve stone age sites, one possible rain-making site, one late iron age stonewalled site, eight sites comprising historic to recent stonewalling, one site comprising a single lower grinding stone, one site comprising a rock boulder associated with cupules and stonewalling and one site comprising a rubbing post.**

- BIRKHOLTZ, P. 2019. Heritage Screening Assessment for the proposed Solar PV Plant at Armoede, near Mokopane, Limpopo Province. T**he fieldwork resulted in the identification of five sites, including three MSA sites, a possible grave, and a historical structure.**

- BIRKHOLTZ, P. AND DE BRUYN, C. 2020a. Heritage impact assessment for the proposed Mogalakwena Mine Integrated Permitting Project near Mokopane, Limpopo Province. **No evidence for any archaeological or heritage sites could be identified.**

- BIRKHOLTZ, P. AND DE BRUYN, C. 2020b. Heritage Scoping Assessment for the Proposed Solar PV Plant at Armoede, near Mokopane, Limpopo Province. **The fieldwork undertaken resulted in the identification of a total of seven (7) sites. These were**

numbered from MGSP 06 to MGSP 12.

- BIRKHOLTZ, P. AND DE BRUYN, C. 2021. Heritage Impact Assessment for the Proposed Solar PV Plant at Armoede, near Mokopane, Limpopo Province. **The fieldwork undertaken resulted in the identification of a total of twenty-one (21) sites. These were numbered from MGSP 13 to MGSP 33.**

- BIRKHOLTZ, P. 2023. Heritage Impact Assessment for the Proposed Mogalakwena Mine, Integrated EIA Project located near the town of Mokopane and situated within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province. **The fieldwork undertaken for this study resulted in the identification of 30 heritage sites. Additionally, 80 heritage sites and 50 grave sites identified during previous studies were included.**

4.2.5 Previous archaeological research from the study area and surroundings

In 1995, Professor Tom Huffman and R.H. Steele of the University of the Witwatersrand conducted archaeological excavations on Iron Age sites at Planknek. The excavations were undertaken to mitigate the impact of the construction of the N1 highway on these Iron Age sites (Huffman & Steel, 1996). Planknek is a saddle in a quartzite ridge located approximately 3 kilometres northeast of the Mokopane WTW.

During the preceding archaeological survey, an Iron Age complex had been identified with later sites recorded on the neck and south of the saddle (named sites 2429AA59 and 2429AA61) and an earlier site north of the saddle (2429AA60). The excavations at site 2429AA59 on the saddle yielded a considerable amount of debris from metal production, broken pottery, and bone. The pottery from the site could be associated with the Moloko and Letaba traditions and indicate that the Northern Transvaal Ndebele lived here between AD 1780 to 1840 (Huffman & Steel, 1996).

The excavations at site 2429AA61 south of the saddle revealed that the Ndebele lived here between AD 1855 to 1875. Mitigation work at site 2429AA60 north of the saddle revealed pottery that could be associated with earlier periods of the Iron Age, including Eiland (between AD 900 and 1300) and early Moloko (between Ad 1350 and 1600) (Huffman & Steel, 1996).

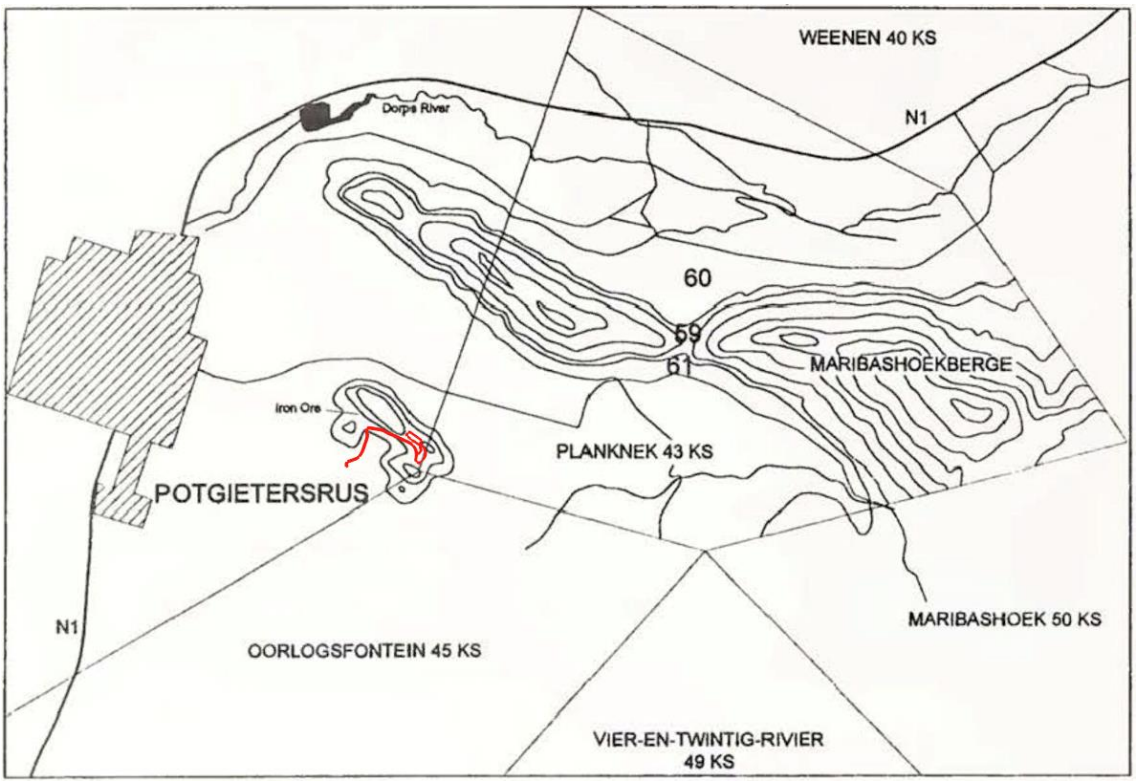

Figure 27 - Overlay of the map depicted in Huffman & Steel (1996:46) and a Google Earth depiction of the position and layout of the Mokopane WTW and access road (red lines). The positions of the three Iron Age sites at Planknek are also shown.

4.2.6 Heritage screening

A screening report was compiled by the Department of Environmental Affairs National Web-based Environmental Screening Tool as required by Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended.

According to the screening report, the study area and surroundings are shown to have a Low Sensitivity rating in terms of archaeology and cultural heritage. A very high sensitivity rating is shown for an area located only a short distance to the northwest. Refer to **Figure 28** below**.**

According to the screening report, the study area and surroundings are shown to have a Medium Sensitivity and High Sensitivity rating in terms of palaeontology. Refer to **Figure 29**Figure 28 below,

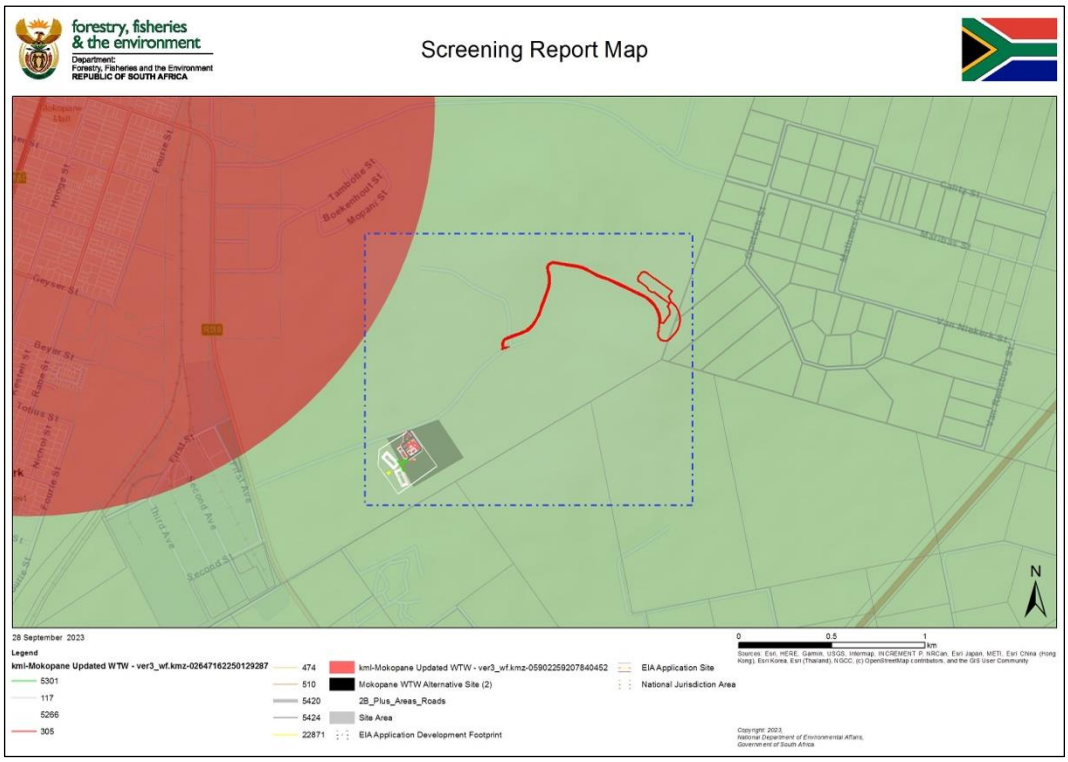

Figure 28 - Screening tool map indicating a primarily low combined sensitivity rating for archaeology and cultural heritage for the study area. There is a very high sensitivity rating located northeast of the study area.

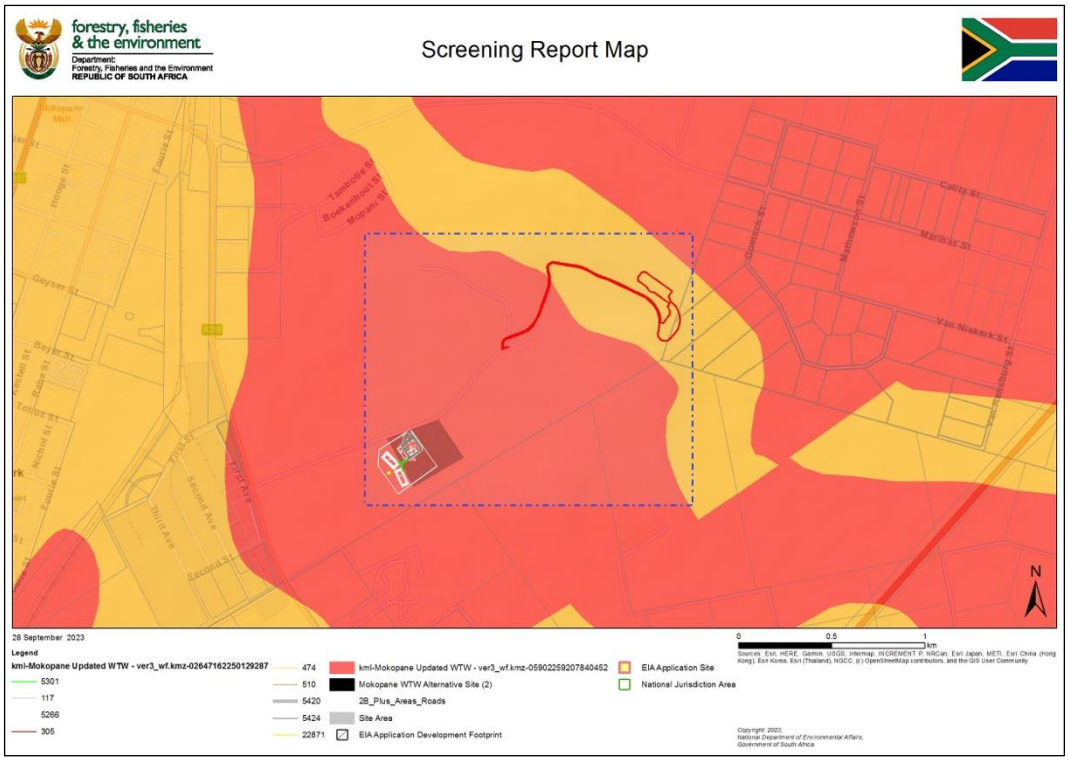

Figure 29 - Screening tool map indicating a medium and high sensitivity rating for palaeontology for the study area.

4.3 Fieldwork findings

The fieldwork undertaken for this study aimed to identify tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of walkthroughs of the proposed development footprint areas.

On Wednesday, 30 August 2023, this fieldwork was undertaken by an archaeological team comprising one archaeologist (Michelle Sachse) and two archaeological fieldwork assistants (Chene Ackerman and Duncan McLean). The fieldwork team was supported by Samuel Mashishi and Philemon Rabalao, who are two Community Liaison Officers (CLO) working on one of PGS's other projects in the surrounding area.

Hand-held GPS devices were used throughout the fieldwork to record the tracklogs showing the routes followed by the archaeologists and heritage specialists on site. Refer to **Figure 30** for the map depicting the tracklogs recorded during the fieldwork.

Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

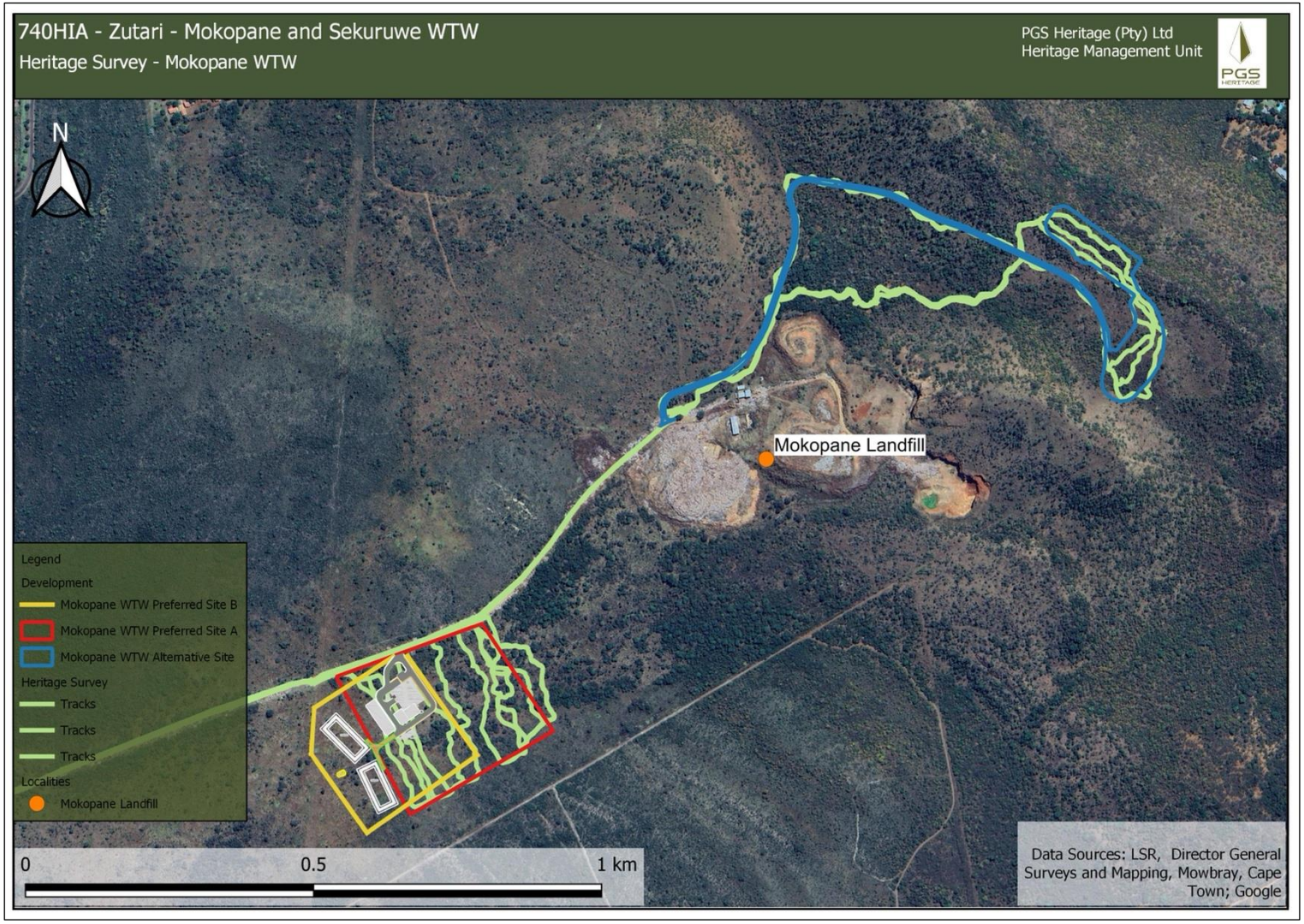

Figure 30 – This map depicts the tracks that were recorded by the team during the fieldwork. The tracks are shown in light green.

5 IMPACT ASSESSMENT

5.1 Introduction

In this section, an assessment will be made of the impact of the proposed development on the identified heritage sites.

5.2 Identification of Impact Risks

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. As indicated in **Section 1.3** (Assumptions and Limitations), the risk exists for heritage resources not identified during the present fieldwork to be located within the study area. This risk is due to the vegetation cover observed in sections of the study area, and the identification and excavation of Iron Age sites a few kilometres northeast of the study area (Huffman & Steel, 1996). Additionally, a section of the latest footprint for the Preferred Site was only available after the fieldwork and could not be assessed in the field.

The following impact risk can, therefore, be identified:

- Destruction of presently unknown heritage resources

5.3 Impact Assessment

5.3.1 Assessment of Impact on Presently Unknown Heritage Resources

In this section, the impact of the proposed development on presently unknown heritage resources will be assessed. In this instance, the term 'presently unknown heritage resources' refers to archaeological and heritage sites that were not identified during the fieldwork. This may have been due to dense vegetation or the subterranean characteristics of some archaeological sites.

Table 4 - Assessment of the Impact on Presently Unknown Heritage Resources

Project phase	**Construction**	
Impact	**Impact on Presently Unknown Heritage Resources**	
Description of impact	**Destruction / Damage to Presently Unknown Heritage Resources**	
Mitigatibility	High	Mitigation exists and will reduce the significance of impacts
Potential mitigation	**See Chapter 6**	
Assessment	**Without mitigation**	**With mitigation**

Nature	Negative	Negative
Duration	Long-term	Medium-term
Extent	Regional	Regional
Intensity	High Negative	Moderate Negative
Consequence	Highly detrimental	Moderately detrimental
Probability	Fairly likely, i.e. could happen	Unlikely
Significance	**Moderate - negative**	**Low - negative**

The impact assessment undertaken in **Table 4** above has revealed that the significance of the unmitigated impact risk in terms of the destruction of presently unknown heritage resources is expected to be of **Moderate (Negative) Significance**. The assessment has also indicated that the impact risk is expected to be of **Low (Negative) Significance once mitigation is completed**. This calculation clearly indicates that mitigation would be required. The required mitigation is provided in **Chapter 6** below. The required mitigation is provided in **Chapter 6** below.

6 MITIGATION

6.1 Introduction

As no heritage resources were identified during the fieldwork, no impact assessment calculations could be undertaken to assess the impact of the proposed development on identified heritage sites. However, the risk was identified for presently unknown heritage resources to be destroyed during construction activities. Mitigation measures would be required to address the identified impact risk.

6.2 Required Mitigation

The following mitigation is required:

- An archaeological watching brief must be implemented during the construction phase. This watching brief is aimed at monitoring the construction and excavation work for any archaeological deposits and features which may be exposed during these development activities.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Introduction

PGS Heritage (Pty) Ltd (PGS) was appointed by Zutari (Pty) Ltd (the client) to undertake a Heritage Impact Assessment (HIA) for the proposed Mokopane Water Treatment Works (WTW) Project. The proposed project is located near the town of Mokopane, which is situated in the Limpopo Province. It falls within the Mogalakwena Local Municipality and the Waterberg District Municipality.

7.2 Desktop Study

A detailed archaeological and historical review of the project area and surrounding landscape was undertaken. This was augmented by a study of available historical and archival maps and an assessment of previous archaeological and heritage studies completed for the area. The desktop study revealed that a long and significant history characterises the surroundings of the study area. Additionally, archaeological and heritage studies from this area have revealed a number of archaeological and heritage sites from the surroundings of the study area.

7.3 Fieldwork

The fieldwork undertaken for this study aimed to identify tangible remains of archaeological, historical and heritage significance. The fieldwork was undertaken by way of walkthroughs of the proposed development footprint areas.

On Wednesday, 30 August 2023, this fieldwork was undertaken by an archaeological team comprising one archaeologist (Michelle Sachse) and two archaeological fieldwork assistants (Chene Ackerman and Duncan McLean). The fieldwork team was supported by Samuel Mashishi and Philemon Rabalao, who are two Community Liaison Officers (CLO) working on one of PGS's other projects in the surrounding area.

Hand-held GPS devices were used throughout the fieldwork to record the tracklogs showing the routes followed by the archaeologists and heritage specialists on site. Refer to **Figure 30** for the map depicting the tracklogs recorded during the fieldwork.

Despite the intensive nature of the fieldwork undertaken for this project, no evidence for any heritage sites could be identified.

7.4 Impact Assessment

As no heritage resources were identified during the fieldwork, no impact on identified heritage resources could be assessed. As indicated in **Section 1.3** (Assumptions and Limitations), the risk

exists for heritage resources not identified during the present fieldwork to be located within the study area. This risk is due to the vegetation cover observed in sections of the study area, and the identification and excavation of Iron Age sites a few kilometres northeast of the study area (Huffman & Steel, 1996). Additionally, a section of the latest footprint for the Preferred Site was only available after the fieldwork and could not be assessed in the field.

The following impact risk can, therefore, be identified:

- Destruction of presently unknown heritage resources

The impact assessment undertaken in **Table 4** has revealed that the significance of the unmitigated impact risk in terms of the destruction of presently unknown heritage resources is expected to be of **Moderate (Negative) Significance**. The assessment has also indicated that the impact risk is expected to be of **Low (Negative) Significance once mitigation is completed**. This calculation clearly indicates that mitigation would be required. The required mitigation is provided in **Chapter 6**.

7.5 Mitigation

As no heritage resources were identified during the fieldwork, no impact assessment calculations could be undertaken to assess the impact of the proposed development on identified heritage sites. However, the risk was identified for presently unknown heritage resources to be destroyed during construction activities. Mitigation measures would be required to address the identified impact risk.

The following mitigation measures are required:

- An archaeological watching brief must be implemented during the construction phase. This watching brief is aimed at monitoring the construction and excavation work for any archaeological deposits and features which may be exposed during these development activities.

7.6 Conclusions

On the condition that the general recommendations and mitigation measures outlined in this HIA report are adhered to and in cognisance of the assumptions and limitations contained in this HIA report, no heritage reasons can be given for the development not to continue.

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8.3 Historical Topographic Maps

All the historical topographical maps used in this report were obtained from the Directorate: National Geo-spatial Information of the Department of Rural Development and Land Reform in Cape Town.

8.4 Google Earth

Google Earth was extensively used in this report.

APPENDIX A
PGS TEAM CVS

PROFESSIONAL CURRICULUM VITAE
FOR POLKE DOUSSY BIRKHOLTZ

Name: *Polke Doussy Birkholtz*

Date & Place of Birth: *9 February 1975 – Klerksdorp, North West Province, South Africa*

Place of Tertiary Education & Dates Associated:

Institution: University of Pretoria

Qualification: BA (Cum Laude) - Bachelor of Arts Specializing in Archaeology, History & Anthropology
Date: 1996

Institution: University of Pretoria
Qualification: BA Hons (Cum Laude) - Bachelor of Arts with Honours Degree Specializing in Archaeology
Date: 1997

Qualifications:

BA - Degree specialising in Archaeology, History and Anthropology
BA Hons - Professional Archaeologist

Memberships:

Association of Southern African Professional Archaeologists (ASAPA)
Professional Member of the CRM Section of ASAPA

Overview of Post Graduate Experience:

1997 – 2000 – Member/Archaeologist – Archaeo-Info
2001 – 2003 – Archaeologist/Heritage Specialist – Helio Alliance
2000 – 2008 – Member/Archaeologist/Heritage Specialist – Archaeology Africa
2003 - Present – Director / Archaeologist / Heritage Specialist – PGS Heritage

Languages: English: Speak, Read & Write & Afrikaans: Speak, Read & Write

Total Years' Experience: 22 Years

Experience Related to the Scope of Work:

- Polke has worked as a **HERITAGE SPECIALIST / ARCHAEOLOGIST / HISTORIAN** on more than 300 projects and acted as **PROJECT MANAGER** on almost all of these projects. His experience includes the following:

    - Development of New Sedimentation and Flocculation Tanks at Rand Water's Vereeniging Pumping Station, Vereeniging, Gauteng Province. Heritage Impact Assessment for *Greenline*.

- EThekwini Northern Aqueduct Project, Durban, KwaZulu-Natal. Heritage Impact Assessment for *Strategic Environmental Focus*.
- Johannesburg Union Observatory, Johannesburg, Gauteng Province. Heritage Inventory for *Holm Jordaan*.
- Development at Rand Water's Vereeniging Pumping Station, Vereeniging, Gauteng Province. Heritage Impact Assessment for *Aurecon*.
- Comet Ext. 8 Development, Boksburg, Gauteng Province. Phase 2 Heritage Impact Assessment for *Urban Dynamics*.
- Randjesfontein Homestead, Midrand, Gauteng Province. Baseline Heritage Assessment with Nkosinathi Tomose for Johannesburg City Parks.
- Rand Leases Ext. 13 Development, Roodepoort, Gauteng Province. Heritage Impact Assessment for *Marsh*.
- Proposed Relocation of the Hillendale Heavy Minerals Plant (HHMP) from Hillendale to Fairbreeze, KwaZulu-Natal. Heritage Impact Assessment for *Goslar Environmental*.
- Portion 80 of the farm Eikenhof 323 IQ, Johannesburg, Gauteng Province. Heritage Inventory for *Khare Incorporated*.
- Comet Ext. 14 Development, Boksburg, Gauteng Province. Heritage Impact Assessment for *Marsh*.
- Rand Steam Laundries, Johannesburg, Gauteng Province. Archival and Historical Study for *Impendulo* and *Imperial Properties*.
- Mine Waste Solutions, near Klerksdorp, North West Province. Heritage Inventory for *AngloGold Ashanti*.
- Consolidated EIA and EMP for the Kroondal and Marikana Mining Right Areas, North West Province. Heritage Impact Assessment for *Aquarius Platinum*.
- Wilkoppies Shopping Mall, Klerksdorp, North West Province. Heritage Impact Assessment for the *Center for Environmental Management*.
- Proposed Vosloorus Ext. 24, Vosloorus Ext. 41 and Vosloorus Ext. 43 Developments, Ekurhuleni District Municipality, Gauteng Province. Heritage Impact Assessment for *Enkanyini Projects*.
- Proposed Development of Portions 3, 6, 7 and 9 of the farm Olievenhoutbosch 389 JR, City of Tshwane Metropolitan Municipality, Gauteng Province. Heritage Impact Assessment for *Marsh*.
- Proposed Development of Lotus Gardens Ext. 18 to 27, City of Tshwane Metropolitan Municipality, Gauteng Province. Heritage Impact Assessment for *Pierre Joubert*.
- Proposed Development of the site of the old Vereeniging Hospital, Vereeniging, Gauteng Province. Heritage Scoping Assessment for *Lekwa*.
- Proposed Demolition of an Old Building, Kroonstad, Free State Province. Phase 2 Heritage Impact Assessment for *De Beers Consolidated Mines*.
- Proposed Development at Westdene Dam, Johannesburg, Gauteng Province. Heritage Impact Assessment for *Newtown*.

- West End, Central Johannesburg, Gauteng Province. Phase 1 Heritage Impact Assessment for the *Johannesburg Land Company*.
- Kathu Supplier Park, Kathu, Northern Cape Province. Heritage Impact Assessment for *Synergistics*.
- Matlosana 132 kV Line and Substation, Stilfontein, North West Province. Heritage Impact Assessment for *Anglo Saxon Group* and *Eskom*.
- Marakele National Park, Thabazimbi, Limpopo Province. Cultural Resources Management Plan for *SANParks*.
- Cullinan Diamond Mine, Cullinan, Gauteng Province. Heritage Inventory for *Petra Diamonds*.
- Highveld Mushrooms Project, Pretoria, Gauteng Province. Heritage Impact Assessment for *Mills & Otten*.
- Development at the Reserve Bank Governor's Residence, Pretoria, Gauteng Province. Archaeological Excavations and Mitigation for the *South African Reserve Bank*.
- Proposed Stones & Stones Recycling Plant, Johannesburg, Gauteng Province. Heritage Scoping Report for *KV3*.
- South East Vertical Shaft Section of ERPM, Boksburg, Gauteng Province. Heritage Scoping Report for *East Rand Proprietary Mines*.
- Proposed Development of the Top Star Mine Dump, Johannesburg, Gauteng Province. Detailed Archival and Historical Study for *Matakoma.*
- Soshanguve Bulk Water Replacement Project, Soshanguve, Gauteng Province. Heritage Impact Assessment for *KWP*.
- Biodiversity, Conservation and Participatory Development Project, Swaziland. Archaeological Component for *Africon*.
- Camdeboo National Park, Graaff-Reinet, Eastern Cape Province. Cultural Resources Management Plan for *SANParks*.
- Main Place, Central Johannesburg, Gauteng Province. Phase 1 Heritage Impact Assessment for the *Johannesburg Land Company*.
- Modderfontein Mine, Springs, Gauteng Province. Detailed Archival and Historical Study for *Consolidated Modderfontein Mines.*
- Proposed New Head Office for the Department of Foreign Affairs, Pretoria, Gauteng Province. Heritage Impact Assessment for *Holm Jordaan Group*.
- Proposed Modification of the Lukasrand Tower, Pretoria, Gauteng Province. Heritage Assessment for IEPM.
- Proposed Road between the Noupoort CBD and Kwazamukolo, Northern Cape Province. Heritage Impact Assessment for *Gill & Associates*.
- Proposed Development at the Johannesburg Zoological Gardens, Johannesburg, Gauteng Province. Detailed Archival and Historical Study for *Matakoma.*

- Polke's **KEY QUALIFICATIONS:**

  - Project Management
  - Archaeological and Heritage Management
  - Archaeological and Heritage Impact Assessment
  - Archaeological and Heritage Fieldwork
  - Archival and Historical Research
  - Report Writing

- Polke's **INFORMATION TECHNOLOGY EXPERIENCE:**

  - *MS Office – Word, Excel, & Powerpoint*
  - *Google Earth*
  - *Garmin Mapsource*
  - *Adobe Photoshop*
  - *Corel Draw*

PROFESSIONAL CURRICULUM FOR MICHELLE SACHSE

Archaeologist for PGS Heritage

Summary of Experience

Involvement in various grave relocation projects in the various provinces of South Africa. Expertise in Heritage Impact Assessment Surveys, Historical and Archival Research, Archaeology, Fieldwork including *inter alia* -

Involvement with various Heritage Impact Assessments,

- Heritage Impact Assessments within Gauteng, Limpopo, Mpumalanga, Free State, North West and the Northern Cape and Western Cape Provinces.
- Archaeological Walkdowns for various projects.
- Desktop, archival and heritage screening for projects.
- Instrument Survey and recording for various projects.

Heritage Impact Assessments:

- Proposed New Pit for Msobo Coal (Spitzkop Colliery), in Ermelo, within the Mpumalanga Province. **Position:** Heritage Specialist.
- The Proposed Harmony FSS6 Reclamation Pipeline, Welkom, Free State Province. **Position:** Heritage Specialist.
- Heritage Impact Assessment Report, for the Proposed Kalgold Expansion Project between Mafikeng and Vryburg, the North West Province. **Position:** Heritage Specialist.

- Heritage Impact Assessment Report, for the Proposed Chartwell Data Centre Project in Chartwell, Johannesburg, Gauteng Province. **Position:** Heritage Specialist.
- Proposed Development on Portions of the Farm Rondebult 303 JS, Near Kwa-Guqa, Emalahleni Local Municipality, Nkangala District Municipality, Mpumalanga Province. **Position:** Heritage Specialist.
- The Buffelspoort Solar Photovoltaic (PV) Energy Facility, on Portions 75 and 134 of the Farm Buffelspoort 343 JQ, between Buffelspoort and Mooinooi, in the North West Province. **Position:** Heritage Specialist.
- Proposed Development on Portion 7 of the Farm Langkuil 363 IR, in Meyerton, within the Midvaal Local Municipality, and the Sedibeng District Municipality, in the Gauteng Province**. Position:** Heritage Specialist.
- Heritage Impact Assessment report for the Eskom Gamohaan – Seven Miles 22kV Powerline. On the remaining extent of the Farm Kuruman Reservaat 690, outside and within the informal settlement of Mamoratwe, close to the town of Kuruman, in the Northern Cape Province. **Position**: Heritage Specialist.
- Heritage Impact Assessment (HIA) Report for the ArcelorMittal South Africa (AMSA) Vanderbijlpark Solar Energy Facility. **Position**: Heritage Specialist.
- Heritage Impact Assessment (HIA) Report for the Proposed Mogalakwena Mine Drilling Project Located near the town of Mokopane and situated within the Mogalakwena Local Municipality and the Waterberg District Municipality of the Limpopo Province. **Position**: Heritage Specialist.

Grave Relocation Projects:

- Report on the Relocation of Graves: Relocation of 22 Graves at Nkomati Anthracite Mine on the Farm Fig Tree 503 JU, near Madadeni Mpumalanga Province.
- Report on the Relocation of Graves: Relocation of 27 Graves Located on the Farm Welstand 55 IS, near Kriel, Mpumalanga Province.
- Report on the Relocation of Graves: Relocation of 6 Graves Located on the Farm Klipfontein 241 IS, near Breyten, Mpumalanga province.
- Report on the Relocation of Graves. Relocation of 68 Graves Located at Erf 4460, 4461 and 4463, Kudube Unit 4, in Hammanskraal, Gauteng Province.
- Report on the Relocation of Graves. Relocation of 10 Graves for the Vreugdenburg Family on Portion 246 of the Farm Roodekopjes 417 JQ, near Brits, North-West Province.
- Report on the Relocation of Graves: Two (2) Graves Located at Msobo Coal Mine (Albion Southwest Pit) on Portion 6 of the Farm Witbank 82 IT, near Breyten, Mpumalanga Province. Phase 1.
- Report on the Relocation of Graves: One (1) Grave at Msobo (Spitzkop) on Portion 3 of the Farm Voorslag 274 IS, between Breyten and Ermelo, in the Mpumalanga Province.

- Report on the Relocation of Graves: Relocation of 10 Graves from Sibanye-Stillwater Western Platinum Limited (WPL) on the Farm Rooikoppies 297 JQ, near Marikana, North-West.
- Report on the Relocation of Graves: Two (2) Graves Located at Msobo Coal Mine (Albion Opencast – Tselentis Colliery) on Portion 6 of The Farm Witbank 82 IT, near Breyten, Mpumalanga Province. Phase 2.

Key Qualifications

2016 - 2019	MA in Archaeology University of Pretoria, Pretoria
2015	BA Honours in Archaeology University of Pretoria, South Africa
2012 - 2014	BA (General) University of Pretoria, South Africa Major subjects: Archaeology and History

Professional Qualifications

Professional Archaeologist - Association of Southern African Professional Archaeologists - Professional Member – No 526

Key Work Experience

- 2020 – to date: Archaeologist - PGS Heritage
- 2018 – 2019: Assistant Manager at the Archaeology Laboratory on South Campus at the University of Pretoria

APPENDIX B

IMPACT ASSESSMENT METHODOLOGY

ZUTARI NDODANA
JOINT VENTURE

Lebalelo Water User Association

1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) METHODOLOGY

The Environmental Impact Assessment (EIA) Methodology assists in evaluating the overall effect of a proposed activity on the environment. Determining of the significance of an environmental impact on an environmental parameter is determined through a systematic analysis.

1.1 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

This section briefly outlines the proposed method for assessing the significance of the potential environmental and socio-economic impacts identified during the construction, operational and decommissioning phase.

For each predicted impact, criteria are applied to establish the significance of the impact based on likelihood (probability) and consequence, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place.

The criteria that contribute to the consequence of the impact are **INTENSITY** (the degree to which pre-development conditions are changed); the **DURATION** (length of time that the impact will continue); and the **EXTENT** (spatial scale) of the impact. The sensitivity of the receiving environment and/or sensitive receptors is incorporated into the consideration of consequence by appropriately adjusting the thresholds or scales of the intensity, duration and extent criteria, based on expert knowledge. For each impact, the specialist applies professional judgement to ascribe a numerical rating for each criterion according to the ratings provided. The consequence is then established using the formula:

Consequence = intensity x (duration + extent)

Depending on the numerical result of this calculation, the impact's consequence would be classified as one of the following:

- Extremely; highly; moderately; slightly detrimental;
- Negligible; or
- Slightly, moderately, highly or extremely beneficial.

To determine the significance of an impact, the probability (or likelihood) of that impact occurring is also taken into account. In assigning probability, the specialist must take into account the likelihood of occurrence and the degree of uncertainty and detectability of the impact. Significance is calculated according to the following formula:

Significance = consequence x probability

Depending on the numerical result of this calculation, the impact would fall into a significance category of one of the following:

- Very Low;
- Low (negative or positive);
- Moderate (negative or positive);
- High (negative or positive);
- Very High (negative or positive).

1.2 METHODOLOGY FOR IDENTIFICATION OF MITIGATION MEASURES

The mitigation hierarchy (Figure 1) illustrates the actions which can be undertaken to respond to negative impacts and the preference give to mitigation measures. The topmost measures are preferred, and the preference for mitigation measures decreases the further one moves down the hierarchy.

For each impact assessed, mitigation measures will be proposed to reduce and/ or avoid negative impacts and enhance positive impacts. The mitigation measures identified by the specialists will be reviewed for feasibility with the proponent and then incorporated into the Environmental Management Programme (EMPr) during the EIA Phase to ensure that they are implemented throughout the lifecycle of the proposed project. The EMPr would become a legally binding document should this project receive an Environmental Authorisation.

Figure 1: Mitigation Hierarchy

Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

- Not undertaking certain projects or elements that could result in adverse impacts;
- Avoiding areas that are environmentally sensitive; and
- Putting in place preventative measures to stop adverse impacts from occurring.

Impact minimisation: This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

- Scaling down or relocating the proposal;
- Redesigning elements of the project; and
- Taking supplementary measures to manage the impacts.

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

- Example, by habitat enhancement;
- Restoration of the affected site or environment to its previous state or better; and
- Replacement of the same resource values at another location (off-set), for example, by wetland engineering to provide

The mitigation described in the above diagram represents the full range of plausible and pragmatic measures that can be implemented.