



MOLETLANE MINING PROJECT

Thirty Proposed Drilling Boreholes forming part of Prospecting Activities, Zebediela, Lepele-Nkumpi Local Municipality, Capricorn District Municipality, Limpopo Province.

Heritage Impact Assessment

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Declaration of Independence

The report has been compiled by PGS Heritage, an appointed Heritage Specialist for the Centre for Environmental Management at North-West University. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in the Heritage Impact Assessment Process

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Report Title	Heritage Impact Assessment for the proposed utilisation of 30 proposed drilling boreholes that forms part of the proposed prospecting activities for the Moetlane Mining Project near Zebediela, Lepele-Nkumpi Local Municipality, Capricon District Municipality, Limpopo Province.		
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As indicated in the table below, this Heritage Impact Assessment report was compiled in accordance with the NEMA Appendix 6 requirements for specialist reports.

NEMA REGS (2014) - APPENDIX 6	RELEVANT PAGES AND SECTIONS
Details of the specialist who prepared the report.	Pages i, ii, iii and Appendix B
The expertise of that person to compile a specialist report including a curriculum vitae.	Pages 1 & 2 (Section 1.2) and Appendix B
A declaration that the person is independent in a form as may be specified by the competent authority.	Page ii
An indication of the scope of, and the purpose for which, the report was prepared.	Page 1 (Section 1.1)
The date and season of the site investigation and the relevance of the season to the outcome of the assessment.	Page 13 (Section 3.1)
A description of the methodology adopted in preparing the report or carrying out the specialised process.	Page 13 (Section 3.1)
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure.	Sections 4 to 6
An identification of any areas to be avoided, including buffers.	Section 6
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.	Section 6
A description of any assumptions made and any uncertainties or gaps in knowledge.	Pages 2 and 3 (Section 1.3)
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 7. Please note that no development alternatives were assessed.
Any mitigation measures for inclusion in the EMPr.	Section 8
Any conditions for inclusion in the environmental authorization.	Sections 8 and 9
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Not applicable.
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	Executive Summary and Section 9
If the opinion is that the proposed activity 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	
A description of any consultation process that was undertaken during the course of carrying out the study	Not applicable. A public consultation process will be handled by the client.
A summary and copies if any comments that were received during any consultation process	Not applicable. To date not comments regarding heritage resources that require input from a specialist have been raised.
Any other information requested by the competent authority.	Not applicable.

EXECUTIVE SUMMARY

PGS Heritage was appointed by the Centre for Environmental Management (CEM) to undertake a Heritage Impact Assessment (HIA) for the proposed utilisation of 30 proposed drilling boreholes that forms part of the proposed prospecting activities for the Moletlane Mining Project near Zebediela, Lepele-Nkumpi Local Municipality, Capricon District Municipality, Limpopo Province.

Archival and Historical Desktop Study

The work commenced with an archival and historical desktop study. This study comprised an assessment of the available archival and historical maps as well as a compilation of a historic overview of the study area and surroundings.

As a result of the archival and historical desktop study, it was possible to identify the following historically significant aspects regarding the history of the study area and its immediate surroundings:

- The Kekana Ndebele of Moletlane has lived within the study area for centuries. The Kekana Ndebele originally came from present-day Kwazulu-Natal, before they settled near Randfontein (eMhlangeni), Pretoria (KwaMnyamana) and Belfast (KwaSimkhulu). The followers of Mthombeni left KwaSimkhulu and followed the Olifants River northward. On his way northwards, Mthombeni became known as Gegana (or Kekana) and his followers were referred to as the 'people of Gegana (or Kekana)'. The Kekana Ndebele established themselves at what is today known as Zebediela and founded a settlement known as Moletlane (or Moletlane), a name which still exists today. By the nineteenth century, the Kekana Ndebele community was one of the most prominent groups occupying the region in and around the project area and especially during the reign of Moletlane. His prominence grew during the war between the Boers and the BaPedi known as the Sekhukhune War of 1852. During the war, Moletlane assisted the Boers by providing them with 400 warriors as well as corn and cattle. This, and other acts of diplomacy by Moletlane, resulted in him being given the name 'Mabediela', which means 'The One Who Pacifies'. Zebediela is a corruption of this name.
- Tracing their origins to present-day Lesotho, the Batlokwa ba Mamarela a Bjatladi settled on the lower areas of the Mmabulepu Mountains (Strydpoort Mountains) during the early nineteenth century and named it Bjatladi. This land is located immediately north of the

present study area, and is where the Zebediela Citrus Estate is located. All three clans of the group, namely Tsoai, Mogoto and Mogotlane, settled here. It is clear that the settlement from within the study area known as Mogoto derives its name from this clan name. After the promulgation of the Native Lands Act of 1913, the Bjatladi residents were informed that a new citrus estate was going to be established on their land and they they had to work on the farm to have a right to live there. While some members of the community started working on the Zebediela Citrus Estate in fear of losing their homes, other members of the community refused and settled in the Kekana Ndebele land at settlements such as Makweng and Moseletlane. In 2003, the Bjatladi community's land restitution claim on the citrus estate was successful.

- The Voortrekker party of Louis Tregardt and Johannes Jacobus Janse (Lang Hans) van Rensburg passed through the surroundings of the study area on the way to the north. Their route led them through a poort in the Strydpoort Mountains, which is located a short distance north of the present study area. In the poort, the two Voortrekker leaders started quarreling and the two parties split up, giving the mountain its name. During the Great Trek Centenary Celebrations and Re-enactment Treks of 1938, a monument was erected in the Strydpoort Mountains adjacent to what is now known as the R519 tar road between Zebediela and Polokwane. This monument appears to still exist, and is located 11.43 km north-east of the study area's nearest point.
- Zebediela' Location, which forms part of the overall study area was formally assigned as a location for the Kekana Ndebele of Moletlane. This was in acknowledgement of the assistance provided to the Boers by Moletlane (also known as Mabediela, Sebitiela or Zebediela) during the war with Sekhukhune. In return for his show of loyalty, Zebediela were exempted from taxation in 1846 (this exemption was later revoked), and in 1885 a location was beaconed off by the Zuid Afrikaansche Republiek. This was named Zebediela's Location.
- Although the Zebediela Citrus Estate is located outside of the present study area, the closest point of the proposed study area is only 2.7 km south of the estate. Furthermore, the history of the landscape within which the study area is located is inseparably intertwined with the history of the Zebediela Citrus Estate, which became one of the biggest citrus estates in the country. The history of the estate started with the arrival of I.W. Schlesinger from America. Work on the estate started in 1917 and development of the Zebediela Citrus Estate began immediately with bush-clearing projects, dam building and soil preparation. The first trees were planted in 1918 and within a decade, nine square miles of orange trees had been planted, the fruit of which was already entering the export market. Other activities

undertaken initially included the construction of nearly 200 miles of roads, the erection of accommodation for both white and black staff members, the construction of a packhouse and the excavation of a multitude of irrigation furrows. In 1928 a railway line was built between the then Naboomspruit (Mookgopong) and the citrus estate, to allow for the quicker transportation of the fruit from the estate to the markets further afield. Internal railway lines were also built between the orchards and the packing house. In time, the Zebediela Citrus Estate became one of the largest citrus estates in South Africa.

Fieldwork Findings

A total of six heritage sites were identified at five of the drilling borehole positions: BH12, BH15, BH17, BH18 and BH21. No heritage sites were identified at any of the other drilling boreholes.

Site	Coordinates	Description	Significance
Site 1	S 24.394000 E 29.283000	A low density surface scatter of MSA lithics occurring over a significant component of the footprint area at drilling borehole BH12.	Low
Site 2	S24.38279 E29.32491	Fenced communal cemetery containing a large number of graves. The drilling borehole footprint area at BH15 encloses a section of the cemetery.	Medium to High
Site 3-A	S24.37802 E29.35692	Historical sheep/goat plunge dip with ramp. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 3-B	S24.37795 E29.35659	Historical plunge dip for cattle with exit ramp and associated reservoir, storage bin and borehole. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 3-C	S24.37773 E29.35673	The circular concrete foundation of a second reservoir with a borehole. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 4	S24.37780 E29.35732	An extensive MSA surface concentration commencing well within the drilling borehole footprint at BH17.	Medium

Site 5	S 24.406000 E 29.272000	A low density surface scatter of ESA and MSA lithic material occurs all over the drilling borehole footprint at BH18.	Low
Site 6	S24.38991 E29.33588	A low density surface scatter of ESA, MSA and LSA lithic material occurs all over the drilling borehole footprint at BH21.	Medium

Assessments were made of the impact risk of the proposed development on the six identified heritage sites. These calculations have revealed that the impact risk on three sites (Site 1, Site 3 and Site 5) will fall within the Impact Class 2 range which represents a Low Impact Risk, two sites (Site 4 and Site 5) fall within the Impact Class 3 which is a Moderate Impact risk and one site (Site 2) falls in Impact Class 4 which is High impact risk. While no mitigation would be required for the sites falling with a Low Impact Risk, mitigation would be required for those with a Moderate and High Impact Risk.

Mitigation

The following mitigation measures would be required for the sites with a Moderate and High Impact Risk.

Mitigation Measures required for Site 2:

It is evident that the proposed utilisation of the drilling borehole at BH15 will have a high impact on the cemetery. With the relocation of the cemetery not an option, the following mitigation measures are required:

- BH15 may not be utilised as an exploration drilling borehole.

Mitigation Measures required for Site 4:

The following mitigation measures are required:

- Recording the site using accepted archaeological methods and techniques including the recording of a surface layout of the site using a Total Station.
- A surface collection of the lithics should be made.

- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

Mitigation Measures required for Site 6:

The following mitigation measures are required:

- As the lithics were exposed by ploughing activities, the suggestion is that any recording of the surface layout for only record the lithics in their secondary context.
- A surface collection of the lithics should be made.
- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

General Recommendations

The scope of work that PGS Heritage was appointed for, only entailed a Heritage Impact Assessment on 30 proposed drilling boreholes. None of the associated access roads located outside of each drilling borehole's footprint area formed part of this assessment and was therefore non assessed in the field.

During the fieldwork, assessments were made of the number of drilling boreholes located adjacent to existing roads (including two-track roads). The drilling boreholes which are located adjacent to such existing roads (which must be used by the drilling crews as access roads after the necessary mitigation had taken place at the sites requiring such mitigation), are as follows:

- Drilling Borehole BH3
- Drilling Borehole BH5
- Drilling Borehole BH9
- Drilling Borehole BH12
- Drilling Borehole BH15
- Drilling Borehole BH16
- Drilling Borehole BH19
- Drilling Borehole BH20
- Drilling Borehole BH21
- Drilling Borehole BH22
- Drilling Borehole BH23
- Drilling Borehole BH26
- Drilling Borehole BH28
- Drilling Borehole BH30

For the remainder of the drilling boreholes, access roads will have to be built. Once the footprints of these access roads are finalized and well before the commencement of construction activities, an experienced archaeologist / heritage specialist must be appointed to conduct a walkthrough of these footprints to ensure that no significant archaeological and heritage sites will be affected by the access roads.

Conclusions

On the condition that the mitigation measures and general recommendations outlined in this report are undertaken, any development impacts on the identified heritage sites will be suitably mitigated to allow the development to take place. As such, and on this condition, no heritage reasons can be given for the development not to continue.

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1 INTRODUCTION

PGS Heritage was appointed by the Centre for Environmental Management (CEM) to undertake a Heritage Impact Assessment (HIA) for the proposed utilisation of 30 proposed drilling boreholes that forms part of the proposed prospecting activities for the Moletlane Mining Project near Zebediela, Lepele-Nkumpi Local Municipality, Capricon District Municipality, Limpopo Province.

1.1 Scope of the Study

The exclusive scope of work that PGS Heritage was appointed for was to carry out a Heritage Impact Assessment on 30 proposed drilling boreholes. The aim of this study is to identify possible heritage sites and finds that may occur in the footprint areas of these 30 drilling boreholes. The HIA aims to inform the EIA in the development of a comprehensive EMP to assist the applicant/developer in managing the identified 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 Heritage Impact Assessment was compiled by PGS Heritage (PGS). The staff at PGS has a combined experience of nearly 70 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes and will only undertake heritage assessments where they have the relevant expertise and experience to undertake the work competently.

Polke Birkholtz, the Project Manager and author, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited with the CRM Section of ASAPA. He has 18 years' experience in the heritage assessment and management field and holds a B.A. (cum laude) from the University of Pretoria specialising in Archaeology, Anthropology and History as well as a B.A. (Hons.) in Archaeology (cum laude) from the same institution.

Jennifer Kitto, co-author, has 16 years' experience in the heritage sector, a large part of which involved working for a government department responsible for administering the National Heritage Resources Act, No 25 of 1999. She is therefore well-versed in the legislative requirements of heritage

management. She holds a BA in Archaeology and Social Anthropology and a BA (Hons) in Social Anthropology.

1.3 Assumptions and Limitations

The following assumptions and limitation to this study exist:

- Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. Various factors account for this, including the subterranean nature of some archaeological sites and the current dense vegetation cover. As such, should any heritage features and/or objects not included in the present inventory be located or observed, a heritage specialist must immediately be contacted.
- Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply as set out below.
- Very dense *Acacia Melifera* thickets occurring along the western and south-western ends of the overall study area, created problems as accessibility during the fieldwork. As a result, one of the drilling boreholes (BH29) located within a very dense thicket of *Acacia melifera* could not be accessed in the field. Another drilling borehole (BH24) is located in a slightly more open thicket to the north of BH29. While the centre point of this drilling borehole could be accessed in the field with a significant amount of difficulty, no walkthrough of its surrounding footprint could be undertaken.
- The scope of works that PGS Heritage was appointed for entailed the compilation of a Heritage Impact Assessment on 30 proposed boreholes only. As a result, no access roads or any associated infrastructure located outside of the footprint area assessed at each drilling borehole formed part of this assessment. It must be noted that as agreed with the client, each footprint area had the relevant drilling borehole's centre point in the middle from where the footprint area extended outward for a distance of 50 m from this point in a circular shape around the centre point. In the sections titled 'Executive Summary', "Mitigation Measures and

General Recommendation’ as well as ‘Conclusions’ information will be provided on which drilling boreholes are located on existing road and for which access roads will have to be built. In cases where access roads will have to be built outside of the footprint areas assessed as per the scope of this study, further heritage fieldwork would be required.

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:

- i. National Environmental Management Act (NEMA) Act 107 of 1998
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999
- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002

The following sections in each Act refer directly to the identification, evaluation and assessment of cultural heritage resources.

- i. GNR 982 (Government Gazette 38282, 14 December 2014) promulgated under the National Environmental Management Act (NEMA) Act 107 of 1998
 - a. Basic Assessment Report (BAR) – Regulations 19 and 23
 - b. Environmental Scoping Report (ESR) – Regulation 21
 - c. Environmental Impacts Assessment (EIA) – Regulation 23
 - d. Environmental Management Programme (EMPr) – Regulations 19 and 23
- ii. National Heritage Resources Act (NHRA) Act 25 of 1999
 - a. Protection of Heritage Resources – Sections 34 to 36; and
 - b. Heritage Resources Management – Section 38
- iii. Minerals and Petroleum Resources Development Act (MPRDA) Act 28 of 2002
 - a. Section 39(3)

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34 (1) of the NHRA states that, “no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority...”. In addition, the NEMA (No 107 of 1998) and the GNR 982 (Government Gazette 38282, 14 December 2014) state that, “the objective of an

environmental impact assessment process is to, ... identify the location of the development footprint within the preferred site ... focussing on the geographical, physical, biological, social, economic, cultural and heritage aspects of the environment” (GNR 982, Appendix 3(2)(c), emphasis added). In accordance with legislative requirements and EIA rating criteria, the regulations of SAHRA and ASAPA have also been incorporated to ensure that a comprehensive legally compatible report is compiled.

1.5 Terminology and Abbreviations

Archaeological resources

- i. 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;
- ii. 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;
- iii. 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;
- iv. 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:

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

Earlier Stone Age

The archaeology of the Stone Age, between 400 000 and 2500 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.

Holocene

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

Later 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 people who carried out iron working and farming activities such as herding and agriculture.

Middle Stone Age

The archaeology of the Stone Age between 30-300 000 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.

Table 1: Abbreviations

<i>Abbreviations</i>	<i>Description</i>
AIA	Archaeological Impact Assessment
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
EIA	Environmental Impact Assessment
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
LIA	Late Iron Age
LSA	Later Stone Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act

PGS	PGS Heritage
PSSA	Palaeontological Society of South Africa
ROD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

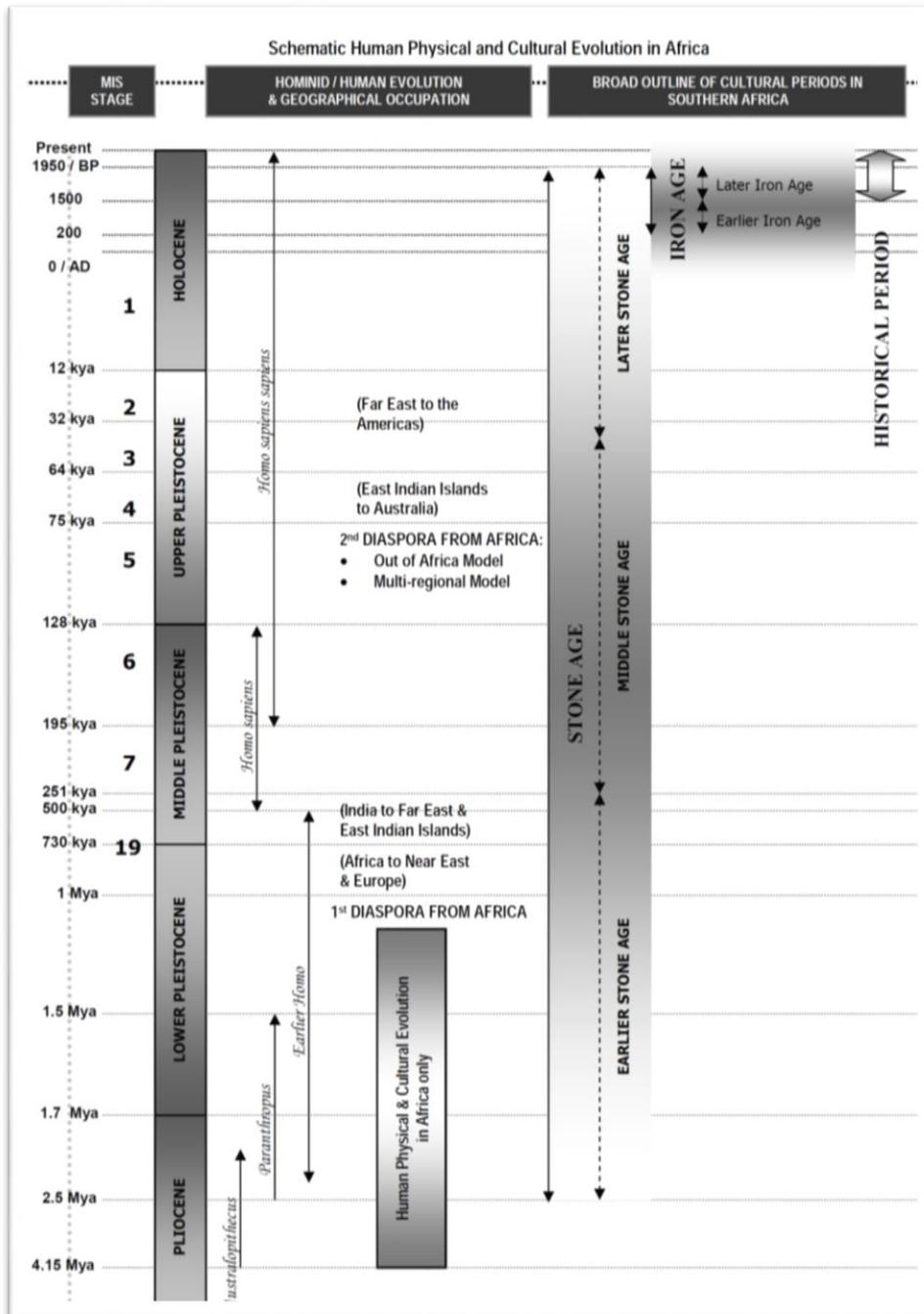


Figure 1 - Human and Cultural Time line in Africa (Morris, 2008)

2 TECHNICAL DETAILS OF THE PROJECT

2.1 Site Location

Property Description	The study area is location on portions of the farms Zebediela's Location 123 KS, Taaiboschlaagte 163 KS and Volop 164 KS.			
Location	The study area is located at Zebediela, roughly 14.7 km south-west of Lebowakgomo and is situated in the Zebediela Tribal Authority of the Lepele-Nkumpi Local Municipality of the Capricorn District Municipality, Limpopo Province.			
Land Description	See Section 4 below.			
Coordinates	Drilling Borehole No	Decimal Coordinates	Drilling Borehole No	Decimal Coordinates
	BH1	S24.368000 E29.262000	BH16	S24.379000 E29.341000
	BH2	S24.370000 E29.280000	BH17	S24.378000 E29.357000
	BH3	S24.364000 E29.290000	BH18	S24.406000 E29.272000
	BH4	S24.368000 E29.304000	BH19	S24.394000 E29.302000
	BH5	S24.364000 E29.312000	BH20	S24.394000 E29.317000
	BH6	S24.378000 E29.262000	BH21	S24.390000 E29.336000
	BH7	S24.383000 E29.278000	BH22	S24.388000 E29.350000
	BH8	S24.376000 E29.293000	BH23	S24.388000 E29.364000
	BH9	S24.373000 E29.318000	BH24	S24.417000 E29.279000
	BH10	S24.370000 E29.351000	BH25	S24.404000 E29.306000
	BH11	S24.391000 E29.265000	BH26	S24.398000 E29.343000
	BH12	S24.394000 E29.283000	BH27	S24.397000 E29.357000
	BH13	S24.385000 E29.298000	BH28	S24.397000 E29.372000
	BH14	S24.381000 E29.310000	BH29	S24.431000 E29.286000
	BH15	S24.383000 E29.325000	BH30	E24.411000 E29.352000



Figure 2 – Google Earth image showing the study area within its wider context..

2.2 Project Description

Prospecting for platinum group metals and diamonds will be conducted on the western side of the area under the prospecting right application, on the farm Zebediela 123 KS and adjacent farms.

The exploration programme for this project would involve three distinct phases. Firstly, a phase to explore the western side of the licence to an inferred level so that different areas can be prioritised for further work, followed by a second phase to delineate zones of mineralisation to an indicated level, and lastly to drill to a measured level where this is justified. Phase 1 of the prospecting programme will be done over a six month period and will include logging, sampling, analysis and rehabilitation of drill sites. It will involve two diamond drill rigs and one percussion rig that will drill an initial 30 boreholes to intersect the Merensky, the UG2 and possibly Plat reefs, approximately 150 - 300 m below the sub-outcrop position (below the Karoo). This will be done by first using percussion drilling to drill through the Karoo cover (approximately 15 000 m), followed by diamond drilling in the Bushveld sequence (approximately 9 000 m).

The nature and extent of prospecting Phase 2, aimed at delineating zones of mineralisation to an indicated level and Phase 3, to establish the mineral resource to a measured level will be dependent on the results obtained during Phase 1.

Prospecting will be done in a well-planned manner, in such a way that environmental harm is prevented as far as possible. Prospecting sites will be located as indicated by the geologist and prospecting activities will be restricted to the surface areas required. Care will be taken to ensure that no new or unnecessary destruction of areas or habitats, other than the demarcated prospecting site will take place. The prospecting activities will utilise existing roads and tracks as far as possible. Camp sites will be sited and fenced, in consultation with the land-owner/occupier. A core storage and processing facility will be erected or rented on or close to site. The recovered core will be geologically logged and sampled for assay at an accredited laboratory.

A camp closure and rehabilitation plan will be drafted and implemented to decommission the camp and drilling sites. Rehabilitation of the camp sites and drilling areas will be done in such a way that it will blend in with the surrounding landscape and allow normal surface drainage to continue. All infrastructure will be removed and the area rehabilitated. No backfilling of boreholes will take place, but the boreholes will be marked and mapped for future reference. Any soil/gravel from the boreholes will be levelled and rehabilitated. Furthermore, it will ensure that new landscape features will be stable and not pose any safety hazard to humans and animals.

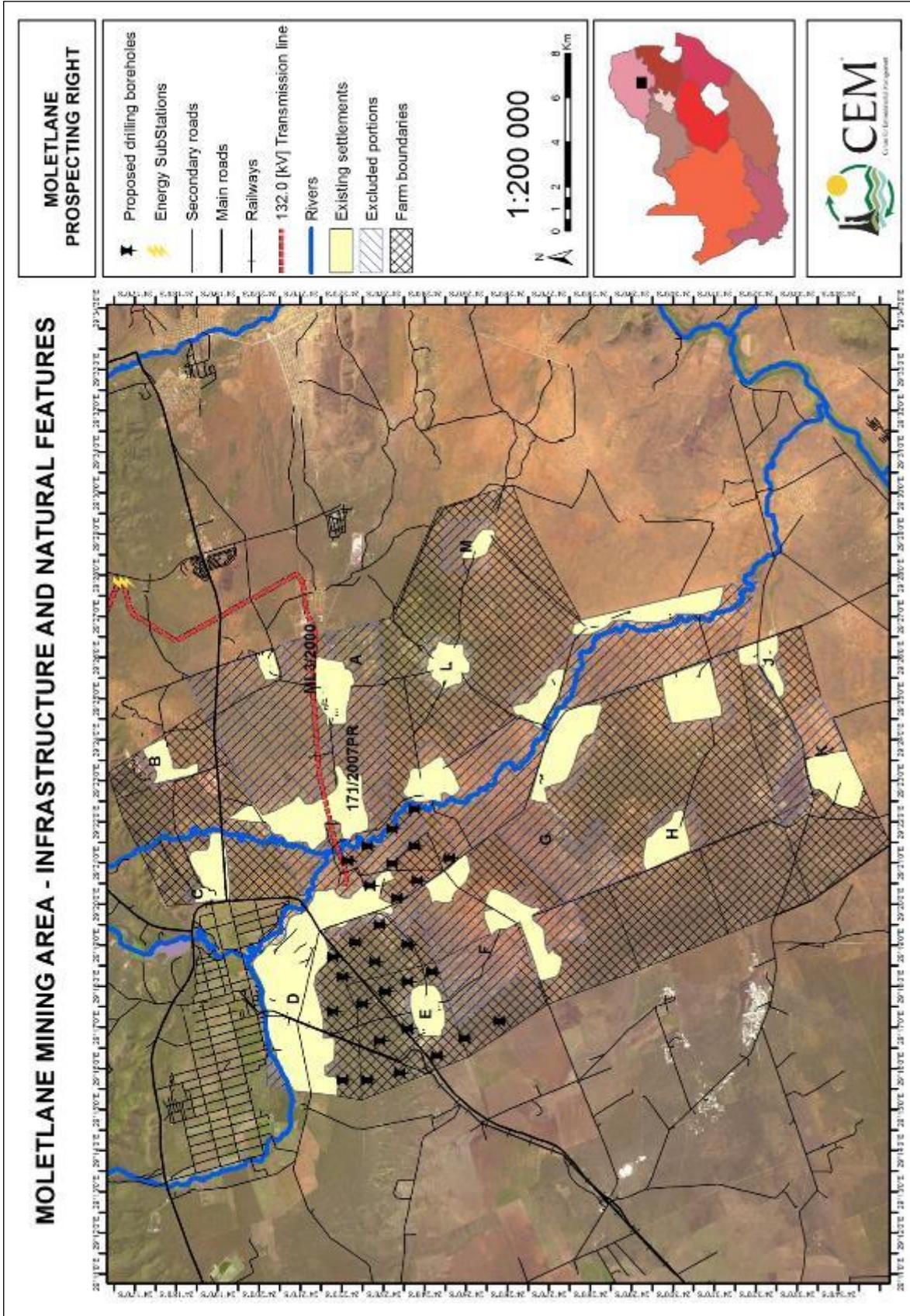


Figure 3 – Development layout plan supplied by the client which depicts the positions of the proposed drilling boreholes.

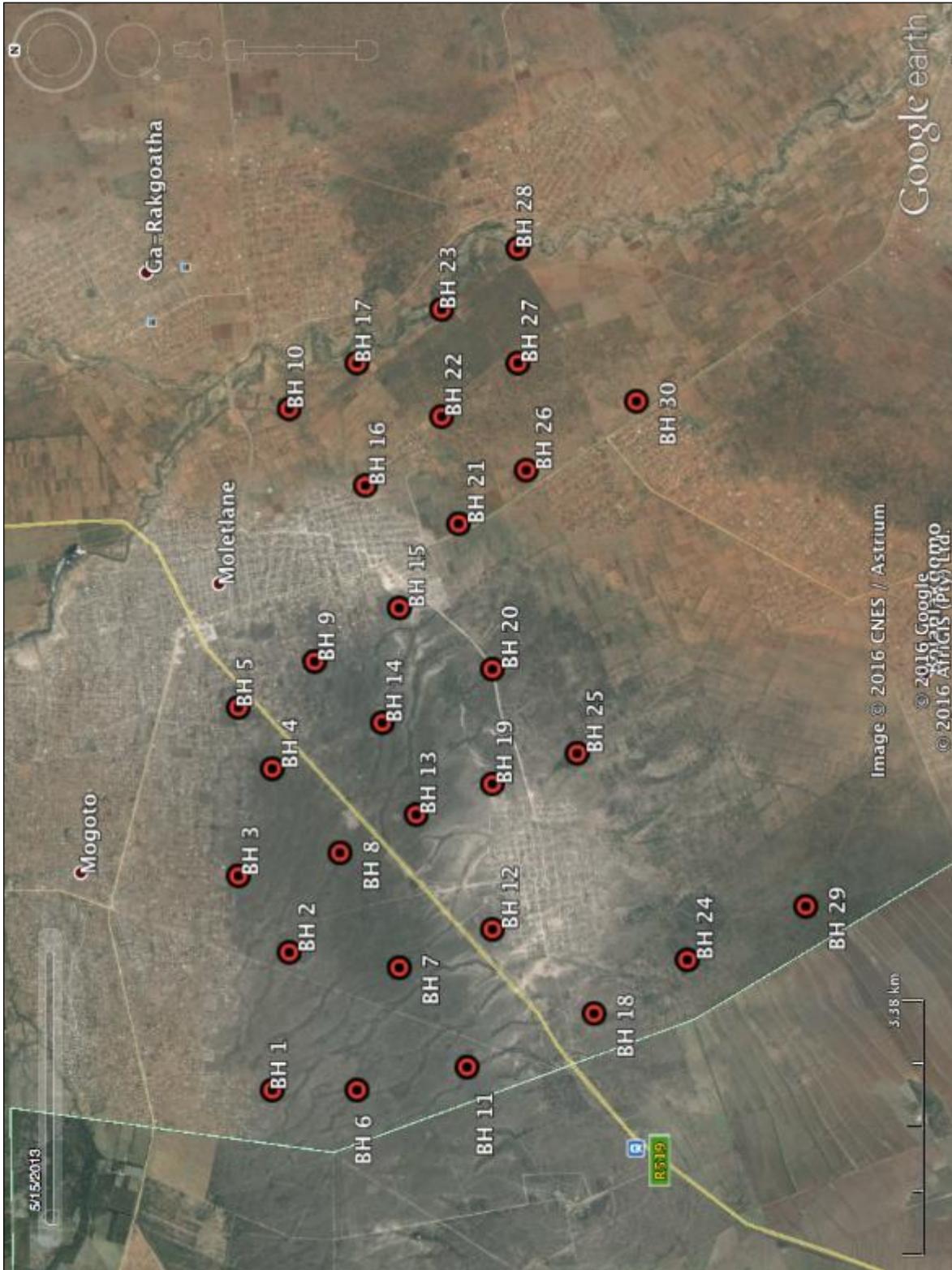


Figure 4 – Google Earth image depicting the positions and individual numbers of all 30 proposed drilling boreholes.

3 ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies utilised in the study.

3.1 Methodology for Assessing Heritage Site Significance

This HIA report was compiled by PGS Heritage for 30 proposed drilling boreholes forming part of the exploration activities of the Moletlane Mining Project. 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 – Literature Review: A general archival and historical background study was carried out to provide historical context for the study area and any identified heritage sites identified within the study area.

Step II – Physical Survey: A physical survey was conducted through the proposed project area by a fieldwork team comprising an archaeologist (Polke Birkholtz) and field assistant (Derek James). The fieldwork comprised access to each of the 30 drilling boreholes, followed by a walkthrough of a footprint area (with a radius of 50 m) surrounding each drilling borehole. The fieldwork was aimed at locating and documenting sites falling within and immediately adjacent to the proposed development footprint. The survey was conducted between 21 and 24 March 2016. Although the fieldwork was carried out during the early summer months, the vegetation was quite dense in places. While this would have had little impact on the most of the survey, drilling borehole BH29 could not be accessed in the field whereas BH24 could be accessed with difficulty, but a walkthrough of this footprint area could not be undertaken. Written descriptions, photographs and GPS coordinates were taken of all heritage sites identified during the survey.

Step III – The final step involved the compilation of a report which comprised findings of the desktop study and fieldwork. The report also assesses the impact risk of the proposed development on each of the identified heritage sites and outlines mitigation measures that would be required before the construction phase commences.

The significance of identified heritage sites was based on four main criteria:

- Site integrity (i.e. primary vs. secondary context),

- Amount of deposit, range of features (e.g., stonewalling, stone tools and enclosures),
- Density of scatter (dispersed scatter)
 - Low - <10/50m²
 - Medium - 10-50/50m²
 - High - >50/50m²
- Uniqueness; and
- Potential to answer present research questions.

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

A - No further action necessary;

B - Mapping of the site and controlled sampling required;

C - No-go or relocate development activity position;

D - Preserve site, or extensive data collection and mapping of the site; and

E - Preserve site.

Impacts on these sites by the development will be evaluated as follows:

3.1.1 Site Significance

Site significance classification standards prescribed by the SAHRA (2006) and approved by the ASAPA for the Southern African Development Community (SADC) region, were used for the purpose of this report.

Table 2: Site significance classification standards 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	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)	Grade 4A	High/Medium	Mitigation before destruction
Generally Protected B (GP.B)	Grade 4B	Medium	Recording before destruction
Generally Protected C (GP.C)	Grade 4C	Low	Destruction

3.2 Methodology for Impact Assessment

In order to ensure uniformity, a standard impact assessment methodology has been utilised so that a wide range of impacts can be compared. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- Significance;
- Spatial scale;
- Temporal scale;
- Probability; and
- Degree of certainty.

A combined quantitative and qualitative methodology was used to describe impacts for each of the aforementioned assessment criteria. A summarised explanation of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in Error! Reference source not found..

A combined quantitative and qualitative methodology was used to describe impacts for each of the afore mentioned assessment criteria. A summary of each of the qualitative descriptors, along with the equivalent quantitative rating scale for each of the aforementioned criteria, is given in

Table 3.

Table 3 - Quantitative rating and equivalent descriptors for the impact assessment criteria

RATING	SIGNIFICANCE	EXTENT SCALE	TEMPORAL SCALE
1	VERY LOW	<i>Isolated corridor / proposed corridor</i>	<u>Incidental</u>
2	LOW	<i>Study area</i>	<u>Short-term</u>
3	MODERATE	<i>Local</i>	<u>Medium-term</u>
4	HIGH	<i>Regional / Provincial</i>	<u>Long-term</u>
5	VERY HIGH	<i>Global / National</i>	<u>Permanent</u>

3.2.1 Significance Assessment

The significance rating (importance) of the associated impacts embraces the notion of extent and magnitude, but does not always clearly define these, since their importance in the rating scale is very

relative. For example, 10 structures younger than 60 years might be affected by a proposed development, and if destroyed the impact can be considered as VERY LOW in that the structures are all of Low Heritage Significance. If two of the structures are older than 60 years and of historic significance, and as a result of High Heritage Significance, the impact will be considered to be HIGH to VERY HIGH.

A more detailed description of the impact significance rating scale is given in

Table 4 below.

Table 4 - Description of the significance rating scale

RATING		DESCRIPTION
5	VERY HIGH	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4	HIGH	Impact is of substantial order within the bounds of impacts which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3	MODERATE	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	LOW	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	VERY LOW	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity is needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the category represented on the scale, and if used, will replace the scale.
0	NO IMPACT	There is no impact at all - not even a very low impact on a party or system.

3.2.2 Spatial Scale

The spatial scale refers to the extent of the impact i.e. will the impact be felt at the local, regional, or global scale. The spatial assessment scale is described in more detail in **Table 5** below.

Table 5 - Description of the spatial significance rating scale

RATING		DESCRIPTION
5	Global/National	The maximum extent of any impact.
4	Regional/Provincial	The spatial scale is moderate within the bounds of possible impacts, and will be felt at a regional scale (District Municipality to Provincial Level). The impact will affect an area up to 50 km from the proposed site / corridor.
3	Local	The impact will affect an area up to 5 km from the proposed site.
2	Study Area	The impact will affect an area not exceeding the boundary of the study area.
1	Isolated Sites / proposed site	The impact will affect an area no bigger than the site.

3.2.3 Temporal/Duration Scale

In order to accurately describe the impact, it is necessary to understand the duration and persistence of an impact in the environment.

The temporal or duration scale is rated according to criteria set out in **Table 6**.

Table 6 - Description of the temporal rating scale

RATING		DESCRIPTION
1	Incidental	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	Short-term	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	Medium-term	The environmental impact identified will operate for the duration of life of the project.
4	Long-term	The environmental impact identified will operate beyond the life of operation of the project.
5	Permanent	The environmental impact will be permanent.

3.2.4 Degree of Probability

The probability or likelihood of an impact occurring is outlined in **Table 7** below.

Table 7 - Description of the degree of probability of an impact occurring

RATING	DESCRIPTION
1	Practically impossible
2	Unlikely
3	Could happen
4	Very likely
5	It's going to happen / has occurred

3.2.5 Degree of Certainty

As with all studies, it is not possible to be 100% certain of all facts, and for this reason a standard “degree of certainty” scale is used, as discussed in **Table 8**. The level of detail for specialist studies is determined according to the degree of certainty required for decision-making.

Table 8 - Description of the degree of certainty rating scale

RATING	DESCRIPTION
Definite	More than 90% sure of a particular fact.
Probable	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Between 40 and 70% sure of a particular fact, or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
Can't know	The consultant believes an assessment is not possible even with additional research.

3.2.6 Quantitative Description of Impacts

To allow for impacts to be described in a quantitative manner, in addition to the qualitative description given above, a rating scale of between 1 and 5 was used for each of the assessment criteria. Thus the

total value of the impact is described as the function of significance, spatial and temporal scale, as described below:

$$\text{Impact Risk} = \frac{(\text{SIGNIFICANCE} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

An example of how this rating scale is applied is shown below:

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Low	Local	Medium Term	Could Happen	Low
Impact on heritage structures	2	3	3	3	1.6

Note: The significance, spatial and temporal scales are added to give a total of 8, which is divided by 3 to give a criterion rating of 2.67. The probability (3) is divided by 5 to give a probability rating of 0.6. The criteria rating of 2.67 is then multiplied by the probability rating (0,6) to give the final rating of 1,6.

The impact risk is classified according to five classes as described in the table below.

Table 9 - Impact Risk Classes

RATING	IMPACT CLASS	DESCRIPTION
0.1 – 1.0	1	Very Low
1.1 – 2.0	2	Low
2.1 – 3.0	3	Moderate
3.1 – 4.0	4	High
4.1 – 5.0	5	Very High

Therefore, with reference to the example used for heritage structures above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a Low impact.

4 CURRENT STATUS QUO

4.1 General Description of the Study Area

The study area is located at Zebediela, roughly 14.7 km south-west of Lebowakgomo and is situated in the Zebediela Tribal Authority of the Lepele-Nkumpi Local Municipality of the Capricorn District Municipality.

The project involves a total of 30 proposed drilling boreholes which forms part of the prospecting activities for the Moletlane Mining Project. While the drilling boreholes are individually discussed below, the general characteristics for the study area are outlined here.

The study area is located in close proximity to a number of settlements, including Moseletlane, Matshelane, Mogoto, Makweng, Madishaditoro, Ga-Mamogwasa, Manaileng and Bolahlakgomo. In between these various settlements, more undeveloped sections of land are located which appears to be used for grazing activities. Extensive agricultural lands (especially maize) are located along the western bank of the Nkumpi River, all the way to the Manaileng near the western end of the overall study area. As a result, while sections of the study area can be described as reasonably undisturbed, other sections have been disturbed by residential development, railway lines, roads etc.

The study is located in the Savanna Biome and comprises grassland as well as trees. Sections of the study area is covered in dense thonveld vegetation where species such as *Acacia karoo* and *Acacia Melifera* had been observed. In fact, one of the *Acacia Melifera* thickets on the south-western end of the overall study area meant that one of the drilling boreholes (BH29) located within such a thicket could not be accessed in the field. A slightly less dense thicket north of BH29 was still so dense that although the centre point of the drilling borehole (BH24) could be accessed in the field with a significant amount of difficulty, no walkthrough of its surrounding footprint could be undertaken.

In general terms, the surface geology of the study area comprise red alluvial sand in the immediate (and wider) surroundings of the Nkumpi River as well as a number of calcrete ridges on which pebbles and smaller stones were in some cases observed. These include dolerite, quartzite and quartz pebbles and stones. The lower-lying areas in-between these ridges are also primarily characterized by the latter surface geology.



Figure 5 – General view of a section of the study area. Maize crops such as the one shown here are located in the alluvial area west of the Nkumpi River.



Figure 6 – General view of gravel and pebbles in the bed of the Nkumpi River.



*Figure 7 – General view of the vegetation found across many sections of the study area. The vegetation comprises primarily thornveld and grassland. Species frequently observed on site include *Acacia karoo*, *Acacia melifera*, *Euclea crispa* as well as *Aloe*.*



*Figure 8 – Dense thickets of *Acacia melifera* are especially found on the study area’s western and south-western ends. In some cases, these thickets hindered site access and walkthroughs.*

4.2 Description of the Proposed Drilling Boreholes

DRILLING BOREHOLE BH1

Description of Drilling Borehole

Drilling Borehole BH1 is located immediately south of the settlement of Matshelane. While no houses are located within the footprint, it is clear that Matshelane is expanding towards this drilling position. With the exception of a footpath as well as evidence for grazing activities, the drilling borehole is largely undisturbed.

The topography of the drilling borehole can be described as reasonably level.

In terms of geology, the drilling borehole is located on a calcrete ridge. Sections of this calcrete ridge were observed all over the footprint of this drilling borehole.

The vegetation can be described as reasonably dense bushes of medium height including *Acacia spp.* and *Euclea crispa*, with a number of *Aloe spp.* also evident. Significant numbers of wild flowers were also observed.

Photographs



Figure 9 – View of Drilling Borehole BH1. The footpath mentioned in the text can be seen on the left. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH2

Description of Drilling Borehole

Drilling Borehole BH2 is located south-east of Matshelane and south of Magoto. Although the drilling borehole is located in general proximity to the nearest houses (in fact, the drilling borehole is located roughly 494 m south of the outskirts of the nearest settlement), no evidence for disturbance could be identified.

The topography of the drilling borehole can be described as reasonably level.

The surface geology of the drilling borehole is characterised by calcrete, with pebbles and stones on top of the calcrete.

The vegetation can be described as dense bushes of medium height comprising for the most part *Acacia spp.*, including *Acacia karoo*.

Photographs



Figure 10 – View of Drilling Borehole BH2. The dense vegetation mentioned in the text can be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH3

Description of Drilling Borehole

Drilling Borehole BH3 is located immediately south of the settlement of Magoto. In fact, While no houses are located within the footprint, it is clear that Magoto is expanding towards this drilling position. With the exception of a footpath as well as evidence for grazing activities, the drilling borehole is largely undisturbed.

The topography of the drilling borehole can be described as reasonably level.

In terms of geology, the drilling borehole is located on a calcrete ridge. Sections of this calcrete ridge were observed all over the footprint of this drilling borehole.

The vegetation can be described as dense bushes of medium height including *Acacia spp.* and *Euclea crispa*, with a number of *Aloe spp.* also evident. Significant numbers of wild flowers were also observed.

Photographs



Figure 11 – View of Drilling Borehole BH3. The dense vegetation mentioned in the text can be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH4

Description of Drilling Borehole

Drilling Borehole BH4 is located some distance south of the settlement of Magoto. With the exception of footpaths as well as evidence for grazing activities, the drilling borehole is largely undisturbed.

The topography of the drilling borehole can be described as reasonably level.

The surface geology of the drilling borehole can be described as calcrete interposed by pockets of sand.

The vegetation comprises very dense bushes of medium height. For the most part these shrubs can be described as *Acacia spp.*

Photographs



Figure 12 – View of Drilling Borehole BH4. The dense vegetation mentioned in the text can be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH5

Description of Drilling Borehole

Drilling Borehole BH5 is located within the settlement of Magoto. The drilling borehole is located on a level site which had largely been cleared of vegetation due to residential development. A significant component of the drilling borehole footprint comprises stands. Furthermore, one corrugated iron dwelling is also located within the development footprint area. According to long-term resident of Zebediela, Mr. Simon Ledimo Mafakane, no graves of stillborn babies would be buried in proximity to this structure.

The surface geology of the drilling borehole can be described as calcrete interposed by pockets of sand.

While significant sections of the drilling borehole footprint had been cleared of vegetation, a small section of the footprint is covered in dense bushes of small height. For the most part these shrubs can be described as *Acacia spp.*

Photographs



Figure 13 – View of Drilling Borehole BH5. The corrugated iron dwelling mentioned in the text is visible in the back. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH6

Description of Drilling Borehole

Drilling Borehole BH6 is located far away from any of the settlements. The nearest houses are located roughly 1.2 km to the north and forms part of the settlement of Matshelane.

The drilling borehole is located on a level area that is undisturbed.

The surface geology of the drilling borehole can be described as calcrete. Only a very few smaller stones were observed on the calcrete.

The vegetation can be described as dispersed bushes of medium height including *Acacia spp.* and *Euclea crista*, with a number of *Aloe spp.* also evident.

Photographs



Figure 14 – View of Drilling Borehole BH6. The dispersed vegetation is evident. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH7

Description of Drilling Borehole

Drilling Borehole BH7 is located far away from any of the residential settlements. The nearest houses are located roughly 1.4 km to the south-east and forms part of the settlement of Manaileng. Apart from a few cattle tracks, the footprint area is undisturbed.

The topography of the drilling borehole can be described as reasonably level.

The surface geology of the drilling borehole can be described as calcrete interposed by pockets of sand.

The vegetation can be described as very dense bushes of medium height including *Acacia spp.* and *Euclea crispa*, with a number of *Aloe spp.* also evident.

Photographs



Figure 15 – View of Drilling Borehole BH7. The dense vegetation is evident. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH8

Description of Drilling Borehole

Drilling Borehole BH8 is located far away from any of the residential settlements. The nearest houses are located roughly 1.7 km to the south-west and forms part of the settlement of Manaileng. Apart from a few cattle tracks, the footprint area is undisturbed.

The topography of the drilling borehole is level.

The surface geology of the drilling borehole can be described as calcrete, with stones and pebbles on the calcrete. The calcrete is interposed by pockets of dark loam soil..

The vegetation can be described as very dense bushes of medium height including *Acacia spp.* and *Euclea crispa*, with a number of *Aloe spp.* also evident.

Photographs



Figure 16 – View of Drilling Borehole BH8. The dense vegetation is evident. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH9

Description of Drilling Borehole

Drilling Borehole BH9 is located on the periphery of the settlement of Moseletane. Sections of the eastern, western and northern parts of the footprint fall within stands, with at least one corrugated iron dwelling located within the footprint as well.

According to Mr Simon Ledimo Mafakane, these new houses would not have graves of stillborn babies and infants associated with them as such deceased individuals are now taken from the hospital and buried in a designated cemetery far away from any of the residential settlements. Mr. Mafakane did indicate that the custom of burying stillborn babies in proximity to the parents' dwelling was indeed practiced by the Kekana Ndebele, however this custom was practiced many years ago.

The position is located on a level area on a calcrete ridge.

The vegetation of sections of the footprint area can be described as very dense bushes of medium height, including *Acacia spp.* However, all those areas of the drilling borehole footprint area which has now been earmarked for residential development are largely cleared of vegetation.

Photographs



Figure 17 – View of Drilling Borehole BH9. The dense vegetation is evident in the foreground with houses visible in the back. The scale is positioned on the drilling borehole.

DRILLING BOREHOLE BH10

Description of Drilling Borehole

Drilling Borehole BH10 is located some distance away from any of the settlements. It is located roughly 760 m west of Makweng.

The drilling borehole is located roughly 600 m west of the the western bank of the Nkumpi River. The characteristics of the footprint and surrounding landscape suggest that this drilling borehole is located on a flood plain with evidence for extensive ploughing activities in the general surroundings of the footprint area. The Google Earth depiction of this drilling borehole suggests that it formed part of extensive ploughing and agricultural activities.

The drilling borehole is located on a level area and its surface is characterised by only red sand.

The vegetation of sections of the footprint area can be described as dense thornveld consisting of primarily *Acacia karoo* trees.

Photographs



Figure 18 – View of Drilling Borehole BH10. The dense vegetation characterising the footprint area can clearly be seen. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH11

Description of Drilling Borehole

Drilling Borehole BH11 is located far away from any of the residential settlements. The nearest houses are located roughly 1.7 km to the south-east and forms part of the settlement of Manaileng. Apart from a few cattle tracks, the footprint area is undisturbed.

The topography of the drilling borehole footprint has a slight downward slope towards the south.

The surface geology of the drilling borehole can be described as calcrete, with pebbles and stones on the calcrete. The calcrete is interposed by pockets of sandy soil.

The vegetation can be described as a mix of grassland and thornveld, of which the latter is not very dense. Identified vegetation include *Acacia spp.* and *Euclea crispa*.

Photographs



Figure 19 – View of Drilling Borehole BH11. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH12

Description of Drilling Borehole

Drilling Borehole BH12 is located immediately to the north of the settlement known as Manaileng.

While no houses are located within the drilling borehole footprint, a number of houses are located at distances no more than 130 m from the drilling borehole position.

The drilling borehole is located on top of a calcrete ridge and the footprint area is level.

The vegetation can be described as *Acacia spp.* thornveld, albeit this vegetation is very sparse. This lack of dense vegetation suggests that the footprint area had been cleared for residential purposes in the past.

Photographs



Figure 20 – View of Drilling Borehole BH12. A number of the houses from the settlement known as Manaileng can be seen in the back. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH13

Description of Drilling Borehole

Drilling Borehole BH13 is located some distance away from any of the residential settlements. The nearest houses are located roughly 1.1 km to the south-west and forms part of the settlement of Manaileng. This said, during the site visit an excavator was seen mechanically clearing a stand in proximity to the footprint, with a large rectangular area which had been cleared previously, located immediately north of the drilling borehole.

The topography of the drilling borehole is level.

The surface geology of the drilling borehole can be described as calcrete that is interposed with pockets of soil.

The vegetation can be described as thornveld (especially *Acacia spp.*) which is not very dense.

Photographs



Figure 21 – View of Drilling Borehole BH13. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH14

Description of Drilling Borehole

Drilling Borehole BH14 is located a short distance from the outskirts of the settlement of Mosetlane. The house is located roughly 200 m to the north-west. Apart from a few cattle tracks, the footprint area is undisturbed.

The topography of the drilling borehole is level.

The surface geology of the drilling borehole comprises for the most part calcrete banks

The vegetation can be described as very sparse thornveld with *Acacia spp.*, *Euclea crispa* and *Combretum spp* observed within the footprint area.

Photographs



Figure 22 – View of Drilling Borehole BH14. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH15

Description of Drilling Borehole

Drilling Borehole BH15 is located on the outskirts of Moseetlane. A significant component of the northern end of the drilling borehole footprint is located on a community cemetery that is still used today.

The drilling borehole is located on top of a calcrete ridge. The topography of the footprint slopes slightly down towards the south.

The surface geology of the drilling borehole can be described as calcrete, with pebbles and stones observed on the calcrete.

The vegetation can be described as reasonably dense thornveld of medium height with *Acacia spp.* and *Euclea crispata* observed on site.

Photographs



Figure 23 – View of Drilling Borehole BH15. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH16

Description of Drilling Borehole

Drilling Borehole BH8 is located within the settlement known as Moseletlane. A corrugated iron building is located within the drilling borehole footprint. According to long-term resident of Zebediela, this structure was to be used as a crèche. A brick ruin is located just outside of the north-eastern periphery of the drilling borehole footprint.

The topography of the drilling borehole is level and the surface geology comprises red soil. The position of the drilling boreholes appears to have been on the flood plain of the Nkumpi River.

Although the footprint area is largely open, some thorn bushes (*Acacia karoo*) are located within the drilling borehole footprint area.

Photographs



Figure 24 – View of Drilling Borehole BH16. The corrugated iron structure that was built to be a crèche can be seen in the back. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH17

Description of Drilling Borehole

Drilling Borehole BH17 is located some distance away from any of the settlements. It is located roughly 630 m west of Makweng.

The drilling borehole is located roughly 120 m south-west of the the western bank of the Nkumpi River. The sections of the drilling borehole position located furthest away from the river comprise red alluvial sand. Closer to the river, extensive gravel banks and shallow erosion gulleys were identified.

A number of agricultural structures were identified within the borehole drilling footprint area, including two plunge dips and the foundation of a reservoir.

Although the footprint area is largely open, some thorn bushes (*Acacia karoo*) are located within the drilling borehole footprint area.

Photographs



Figure 25 – View of Drilling Borehole BH17. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH18

Description of Drilling Borehole

Drilling Borehole BH18 is located some distance away from any of the settlements. It is located roughly 850 m west of Manaileng.

The drilling borehole footprint is largely undisturbed.

This drilling borehole is located on a relatively level site at the summit of a hill. The surface geology consists of patches of calcrete pebbles associated with small stones and pebbles. These features are interposed by pockets of soil.

The vegetation comprises relatively open sections of thornveld (*Acacia Karoo*, *Euclea crispa* etc.), with small sections of the footprint covered in dense vegetation.

Photographs



Figure 26 – View of Drilling Borehole BH18. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH19

Description of Drilling Borehole

Drilling Borehole BH19 is located immediately to the east of the settlement of Manaileng. Apart from grazing activities and cattle tracks, no evidence for disturbance could be observed. As a result, the drilling borehole footprint is largely undisturbed.

The drilling borehole is located on land which slopes down towards the east.

The surface geology comprises small calcrete pebbles with some other pebbles and small stones evident as well.

The vegetation is largely open with some thorny bushes which were found to be quite dense in places.

Photographs



Figure 27 – View of Drilling Borehole BH19. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH20

Description of Drilling Borehole

Drilling Borehole BH20 is located on the new road construction between Manaileng and Mosetlane. With the centre point of the proposed drilling borehole located roughly in the middle of a new road which is under construction, significant sections of the drilling borehole footprint had been disturbed. The disturbance of the road extends for roughly 10-15 m on each side of the centre point of the drilling borehole across the width of the road.

Outside the disturbed area, the landscape is flat and characterised by calcrete banks interspersed with some pebbles and smaller stones.

The vegetation comprises low and dense thorny bushveld (including *Acacia karoo*).

Photographs



Figure 28 – View of Drilling Borehole BH20. The scale is positioned on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH21

Description of Drilling Borehole

Drilling Borehole BH21 is located south Moseletane inside a maize field. The nearest houses are located on the southern periphery of Mostelane, and is roughly 500 m north of the drilling borehole.

The drilling borehole is located on the fence between two fenced plots of land used for the production of maize.

The topography of the drilling borehole can be described as reasonably level.

The surface geology of the drilling borehole is characterised primarily by dark loamy soil. Some calcrete chunks appear to have been brought to the surface during ploughing activities.

Apart from the maize crop, almost no other vegetation is found within the drilling borehole footprint.

Photographs



Figure 29 – View of Drilling Borehole BH21. The maize field mentioned in the text can clearly be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH22

Description of Drilling Borehole

Drilling Borehole BH22 is located a short distance south-east of Matshelane, with the nearest houses to the drilling borehole located 327 m to the north-west. The proximity of the footprint to the nearby settlement is also evident by the presence of a line of fence poles through the footprint. While this line had not yet been fenced, it shows that some level of disturbance had already taken place.

The topography of the drilling borehole can be described as reasonably level. The surface geology of the drilling borehole is characterised by red sandy soil.

Although the drilling borehole is located 1.1 km west of the Nkumpi River, the characteristics of the site suggest that it is also located on the river's flood plain.

The vegetation can be described as thornveld comprising for the most part *Acacia karoo*, which is quite dense in places.

Photographs



Figure 30 – View of Drilling Borehole BH22. The red sand characterising the site can clearly be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH23

Description of Drilling Borehole

Drilling Borehole BH23 is located some distance away from any of the settlements. It is located north-west of Madishaditoro, and the nearest houses are roughly 800 m to the south-east. This position is located on the western bank of the Nkumpi River and encloses a section of the river course. The geology of the river bank is mostly sandy, while the river bed contains a significant number of medium to large pebbles. Due to a section of the drill position site being covered in very dense vegetation, not all areas of the footprint could be covered on foot. For the most part, the vegetation comprises reasonably dense *Acacia karoo* thornveld, as well as small sections of very dense riverine forest. While sections of the drilling borehole footprint is largely undisturbed, the sand and stone from the river bed is informally quarried by local building suppliers and/or builders.

Photographs



Figure 31 – View of Drilling Borehole BH23 (top) and the Nkumpi River (below).

DRILLING BOREHOLE BH24

Description of Drilling Borehole

Drilling Borehole BH24 is located far away from any of the settlements. The closest settlement to this drilling borehole position is Manaileng, which is roughly 890 m to the north-east.

The drilling borehole position is located on level ground. However, it is covered in extremely dense thornveld vegetation, and especially *Acacia melifera* (Black Hook Thorn).

With some difficulty the drilling borehole position was accessed, however the thornveld thicket just became so dense that it was impossible to conduct any walk-throughs around the drilling borehole. This was the densest vegetation the fieldwork team found anywhere during the fieldwork.

The surface geology of the drilling borehole was impossible to ascertain due to the dense vegetation.

Photographs



Figure 32 – View of Drilling Borehole BH24. The extremely dense vegetation mentioned in the text can be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH25

Description of Drilling Borehole

Drilling Borehole BH25 is located south-east of Manaileng, with the nearest houses to the drilling borehole located 630 m to the west.

The topography of the drilling borehole can be described as reasonably level.

Sections of the surface geology of the drilling borehole is characterised by calcrete banks with small stones and pebbles.

The vegetation can be described as very dense thornveld comprising for the most part *Acacia spp.*, including *Acacia karoo*.

Photographs



Figure 33 – View of Drilling Borehole BH25. The dense vegetation mentioned in the text can be seen. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

DRILLING BOREHOLE BH26

Description of Drilling Borehole

Drilling Borehole BH26 is located a short distance north-east of Ga-Mamogwasa. The nearest houses to the drilling borehole footprint is roughly 210 m to the south-west. The drilling borehole is located on a level site situated in a maize field. Red alluvial sand characterises the surface geology. A fence bisects the footprint along an east-west direction. A second fence, with razor wire, bisects the footprint a short distance away from the first fence. Access to this section of the footprint was not possible due to the razor wire. However, the surface of the inaccessible area was open and visible so that a fair assessment could be made. Apart from the maize crop, almost no other vegetation is found within the footprint.

Photographs



Figure 34 – View of Drilling Borehole BH26 (top) and the inaccessible fenced corridor (below).

DRILLING BOREHOLE BH27

Description of Drilling Borehole

Drilling Borehole BH27 is located far away from any of the settlements, the closest being Ga-Mamogwasa at a distance of roughly 1.5 km to the south-west. The topography of the drilling borehole can be described as reasonably level. The surface geology of the drilling borehole is characterised by red sandy soil. Although the drilling borehole is located 1.2 km south-west of the Nkumpi River, the characteristics of the site suggest that it is also located on the river's flood plain. The vegetation can be described as thornveld comprising for the most part *Acacia karoo*, which is quite dense in places.

Photographs



Figure 35 – View of Drilling Borehole BH27 (top) and the red sand found across the site (below).

DRILLING BOREHOLE BH28

Description of Drilling Borehole

Drilling Borehole BH28 is located in the bed of the Nkumpi River. It is located a short distance west of Madishaditoto with the nearest houses from this settlement located roughly 285 m to the east. As the drilling borehole footprint area is located within the bed of the Nkumpi River, its surface is quite even as a result of flooding activities as well as sand and stone quarrying activities. The surface geology can be described as pebble beds as well as river sand. A number of reasonably deep excavations attest the use of the site for sand and stone quarrying activities, quite likely for the local building trade. Only sparse vegetation covers the surface of the river bed. Three massive Acacia trees (species not known) are located at a distance of 40-50m from the borehole drilling point.

Photographs



Figure 36 – View of Drilling Borehole BH28 (top), general view of the drilling borehole footprint (bottom left) and one of the massive Acacia trees (bottom right).

DRILLING BOREHOLE BH30

Description of Drilling Borehole

Drilling Borehole BH30 is located within Ga-Mamogwasa.

This drilling borehole position is located on a level site situated in an area proposed for the building of houses. The drilling borehole footprint stretches across four housing stands, which are all fenced. One of these stands contain a recent corrugated iron structure. This structure is located near the drilling borehole position. According to Mr Simon Ledimo Mafakabe, this structure is apparently used as a temporary shelter by the people who are intending to build a house on the same stand. Mr Mafakane confirmed that no risk for the presence of stillborn babies exist.

The surface geology of the drilling borehole comprises red sand. As the footprint had been cleared to establish the four stands here, very little vegetation exists on site.

Photographs



Figure 37 – View of Drilling Borehole BH30. Note how close the drilling borehole position is to the corrugated iron structure. The scale is positioned directly on the drilling borehole. Scale in 10cm increments.

5 ARCHIVAL AND DESKTOP RESEARCH FINDINGS

The aim of the archival and desktop background research is to identify possible heritage resources that could be encountered during the field work. The archival and desktop research focused on four significant aspects from the history of the study area and its immediate surroundings. These four aspects are the Kekana-Ndebele, Louis Thrichardt, Zebediela's Location and the Zebediela Citrus Estates.

5.1 Significant Aspects Regarding the History of the Study Area

The archival and desktop research of the history of the study area and surrounding landscape identified a number of historical aspects which can be associated with the study area as well as its immediate surroundings. These historical facets will be discussed in more detail and in chronological sequence below..

Please note that the authors are aware of the Makapan Valley with its various historical, archaeological and palaeontological significant sites and features such as Makanpan's Caves, Cave of Hearths etc. The authors are also aware that the Makapan Valley is both a National Heritage and World Heritage site. However, the Makapan Valley is located north-east of Mokopane and 25 km north-west of the closest drilling borehole position forming part of the present study. As a result, the Makapan Valley is not directly associated with the history of the study area and was not included in this section or overall report.

5.1.1 The Kekana Ndebele of Moletlane

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 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. He also 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 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 (Skhosana, 2010, Bergh 1990). Skhosana (2010) references Van Warmelo (1930) and other scholars who subscribe to the view that the so-called Southern and Northern Ndebele of the Republic 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 originate from KwaZulu-Natal. They originally split from the main Hlubi group circa 1552 under the chieftainship of Mafana and subsequently travelled northwards.

The AmaNdebele crossed the Vaal River and entered what is today known as Gauteng, and initially settled around eMhlangeni, known as Randfontein, which is 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 Ndzungza), 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 Ndzungza), 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 Ndzungza), Mthombeni left KwaMnyamana and travelled to KwaSimkhulu, north of Belfast in the present Mpumalanga Province. At KwaSimkhulu, Mthombeni parted ways with Nzunza (or Ndzungza) and moved northwards along the Olifants River until he reached the area around Zebediela. On his way northwards, 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 south-east of Potgietersrus 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 Potgietersrust (Mokpane) on the farm Pruissen. This group was known as the Kekana Ndebele of Mugombhane (who was also known as Sejwamadi, Mokopane and Makapane) (Bergh, 1999).

By the nineteenth century, the Kekana Ndebele community was one of the most prominent groups occupying the region in and around the project area and especially during the reign of Moletlane. His prominence grew during the war between the Boers and the BaPedi known as the Sekhukhune War of 1852. During the war Kgosi Moletlane assisted the Boers by providing them with 400 warriors as well as corn and cattle. This, and other acts of diplomacy by Moletlane, resulted in him being given the name ‘Mabediela’, which means ‘The One Who Pacifies’.

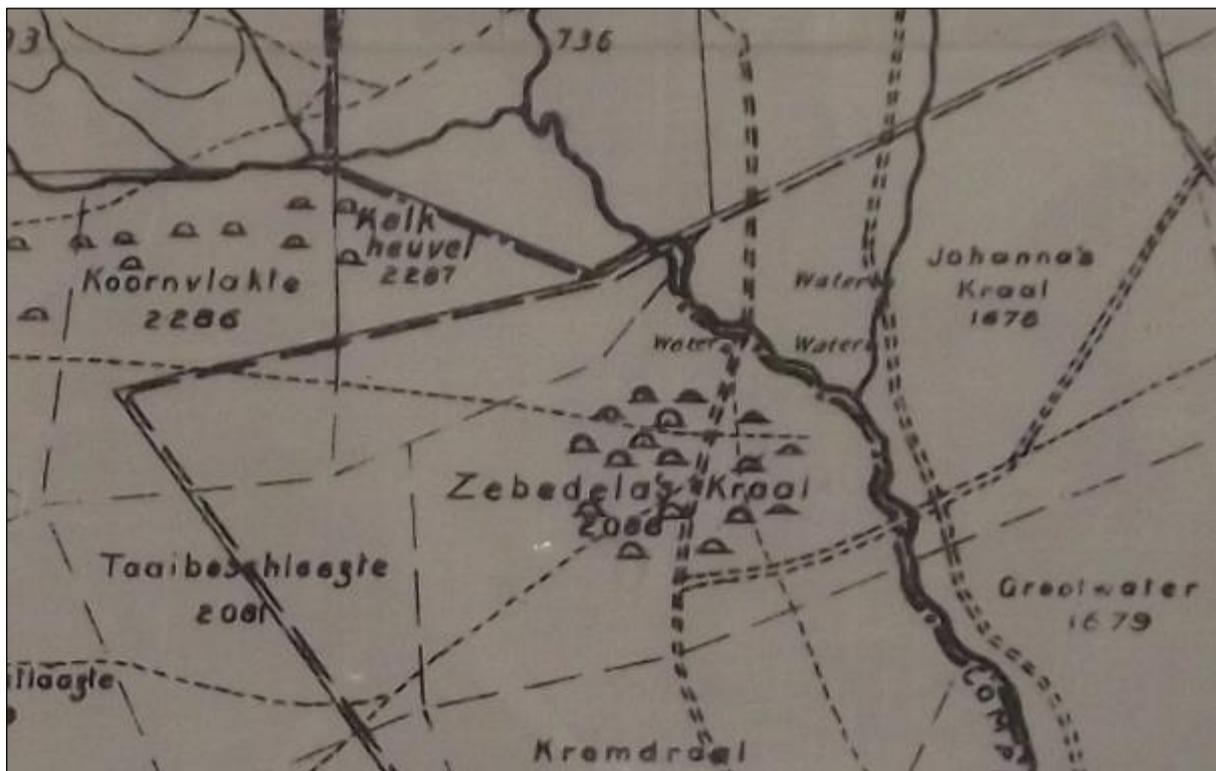


Figure 38 – Detail view of the Nylstroom-Pietersburg Sheet of the Major Jackson Map Series. This sheet is the third revised edition of the map and was compiled in June 1902 (National Archives, Maps, 3/557). The map shows the position of Zebediela’s settlement within the boundaries of Zebediela’s Location at the turn of the century. The position of this settlement is in the general area where the present-day settlement of Moseletlane is still located. The settlement depicted further to the north-west appears to be the settlement of the Batlokwa ba Mamarela a Bjatladi.

5.1.2 The Batlokwa ba Mamarela a Bjatladi

The farm Zebediela 101 KS, where the Zebediela Citrus Estate is located, was officially claimed in terms of the South African land restitution legislation in December 1998 by the Bjatladi Community. In September 2003, a settlement agreement was signed by the Minister of Land Affairs and Agriculture (www.plaas.org.za). In this section, a short history will be provided of the Batlokwa ba Mamarelo a Bjatladi, whose ancestral land was located immediately north of the present study area.

The Batlokwa ba Mamarelo a Bjatladi trace their history back to the Batlokwa ba Manthatisi who lived in present-day Lesotho during the late 1700s under their famous ruler Queen Manthatisi (more commonly through erroneously known as Mantatees). The Batlokwa ba Manthatisi became embroiled in the period of unrest and upheaval known as the Mfecane (the crushing) or Difaqane (forced migration) and the followers of Queen Manthatisi appear to have ended up at the Malatje Mountains at Sekhukhune during the early 1800s where tensions in the community led to the dethroning of the queen. As a result, the Batlokwa ba Manthatisi split into two separate groups, namely the Batlokwa ba Mamabolo and the Batlokwa ba Mamarela a Bjatladi.

While the Batlokwa ba Mamabolo moved to the area presently still known as Mamabolo, the Batlokwa ba Mamarela a Bjatladi were spread out across the Mmabulepu Mountains. Later, they were re-united as a community which comprised three clans, Tsoai, Mogoto and Mogotlane. In 1814, these three clans of the Batlokwa ba Mamarela a Bjatladi settled along the lower areas of the Mmabulepu Mountains and named it Bjatladi (www.plaas.org.za).

Shortly after the promulgation of the Native Land Act of 1913, I.W. Schlesinger “...*disturbed the existence of the Bjatladi community. He informed the community that the Commissioner of Native Affairs and Administration had granted him permission to farm the land and instructed the community to work on the farm under his supervision if they wished to continue living there. Some agreed out of fear of eviction, while others refused, indicating that they were not prepared to be slaves on their own land.*” (www.plaas.org.za). Some community members who left the land settled at Makweng and Moletlane within the area known as Zebediela’s Location. While still maintaining their own identity, the Bjatladi Community became part of the area falling under the jurisdiction of the Kekana (www.plaas.org.za).



Figure 39 – Historical photograph that was published in Combrink (1954) to illustrate the ‘original compounds’ at the Zebediela Citrus Estate. As seen in the history of the Batlokwa ba Mamarelo a Biatladi, some of the community members remained behind in fear of losing their land and would have stayed in homesteads as depicted here.

5.1.3 The Trek of Louis Tregardt and Johannes Jacobus Janse (Lang Hans) van Rensburg

During the 1830s a 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. These people were known as Voortrekkers (those who travel 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 Heidelberg in a northward direction. While the exact route followed by these Voortrekkers are 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. With the Strydpoort Mountains located directly north of the present study area, their route from the Olifants River would have taken them either through the present study area or in close proximity to it.

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).

Their route through the Strydpoort Mountains is located a short distance north of the present study area. During the Great Trek Centenary Celebrations and Re-enactment Treks of 1938, a monument was erected in the Strydpoort Mountains adjacent to what is now known as the R519 tar road between Zebediela and Polokwane. This monument appears to still exist, and is located 11.43 km north-east of the study area's nearest point.

After the separation of the two Voortrekker parties, Louis Tregardt continued northward and passed the present-day town of Polokwane before reaching the Soutpansberg. The Van Rensburg trek met a violent end in present-day Mozambique when they were attacked and the entire party (with the exception of two children) annihilated by a Zulu Impi (www.wikipedia.org).

Meanwhile, Louis Tregardt had continued to the area around the present day town of Louis Trichardt to await the arrival of other Voortrekker parties, specifically that of Hendrik Potgieter. However, after waiting more than a year without receiving any news from Potgieter, Tregardt decided to make for Delagoa Bay in present-day Mozambique. In August 1837, with the assistance provided by two soldiers sent by the Portugues Governor of Delagoa Bay, Trichardt's group began the journey from the Soutpansberg to Delagoa Bay. After travelling south-west and crossing the Strypoort Mountains once more, the Tregardt party followed the course of the Olifants River eastwards (Bergh, 1990). Tragically, after their successful arrival in Delagoa Bay, Louis Trichardt, his wife and many of the party died of malaria (Ransford. 1968).

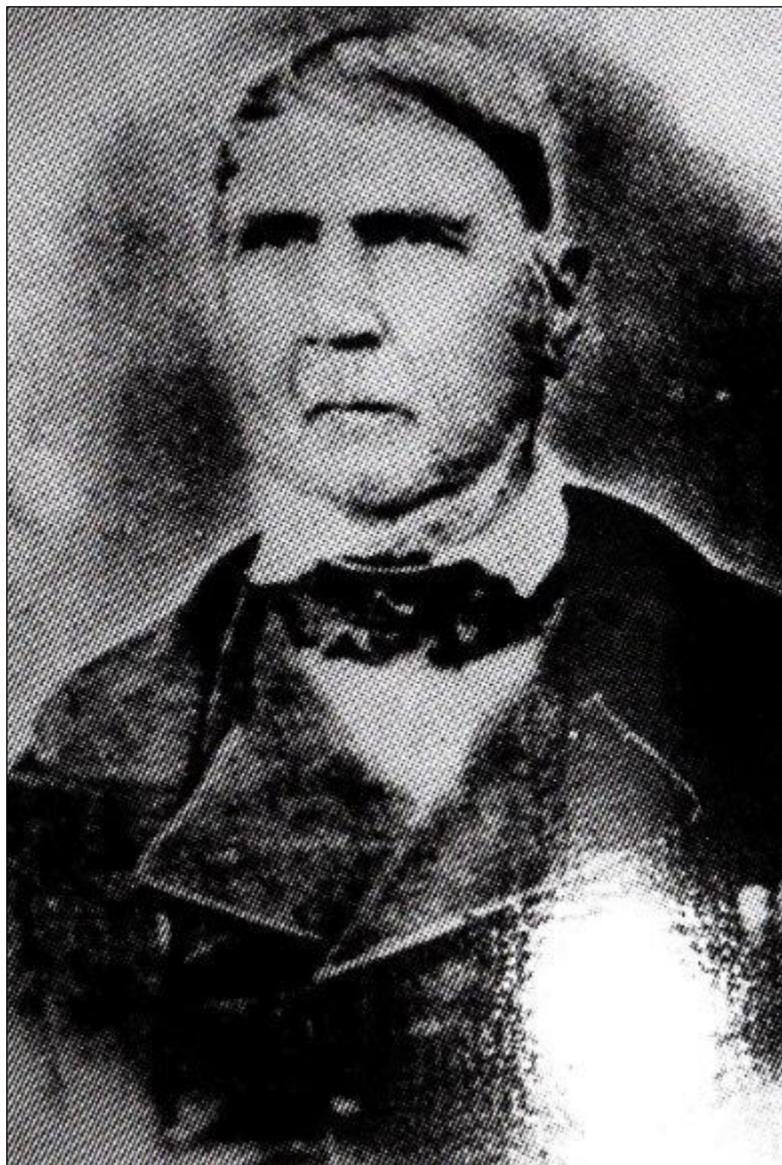


Figure 40 – Voortrekker leader Louis Tregardt (Visagie, 2011:500).

5.1.4 Zebediela's Location

The drilling boreholes comprising the study area, are located on the farms Zebediela's Location, Taaiboschlaagte and Volop. Zebediela's Location is an extensive farm with an interesting history.

In 1852, the so-called Sekhukhune War was fought between the Boers and the BaPedi. The leader of the Kekana Ndebele at the time was Moletlane (also known as Mabediela, Sebitiela or Zebediela), who decided to assist the Boers by providing them with 400 warriors as well as corn and cattle. In return for this show of loyalty, Zebediela and his followers were exempted from taxation in 1846 (this exemption was later revoked), and in 1885 a location was beacons off by the Zuid Afrikaansche Republiek (Z.A.R.). This location was named Zebediela's Location, in honour of the kgosi (www.historicalpapers.wits.ac.za) (Combrink, 1954).

Bergh (1999) provides more details of the farms that were included in Zebediela's Location. He relates that in June 1885, the Native Location Commission of the Z.A.R. beacons off an initial area of six farms for the Kekana Ndebele of Moletlane. These six farms were Zebedielas Kraal 2288 (where the main settlement of Kgosi Moletlane was located), Kromdraai 2289, Grootwater 1679, Koornpunt 2295, Rooiloop 1680 and Sweden 2294. In March 1888, the district boundary between the Waterberg and Soutpansberg Districts, which up to this point bisected the newly established location, was moved to allow the entire location area to fall within the Waterberg District. During 1904 a number of farms and portions of farms were also added to Zebediela's Location. It would appear that with the addition of these properties, the boundaries of the location looked very similar to the current boundaries of the farm of this name. The properties added in 1904 include Koornvlakte 2286, Kalkheuwel 2287, Groothoek 735, Taaiboschlaggten 2077, Johanneskraal 1678, Zwartfontein 734, Volop 2285, Rooiwater 1676, Zuurbult 2290, Zwartbult 1675, Stockholm 2291, Turkeygekraal 2296, Gladdedrift 737, Kalkvlakte 2146, Steenbokbult 1813, Batavia 2293, Moulmein 2292, Reserve 1860, Rooiboschbult 549, Koppie Enkel 553, Byldrift 738, Charlotteslust 2065 and Gewensch 1989. A portion of Schaapplaas 736 was originally included but later excluded (Bergh, 1990).

Two cartographic depictions of Zebediela's Location are shown below. The first depiction dates to 1896 whereas the second depiction dates to 1931. It is clear that during the late 19th century the area today known as Zebediela's Location was still subdivided into the original six farms. By 1904, all the properties owned by the Moletlane's Kekana Ndebele were consolidated into a single farm, known as Zebediela's Location.

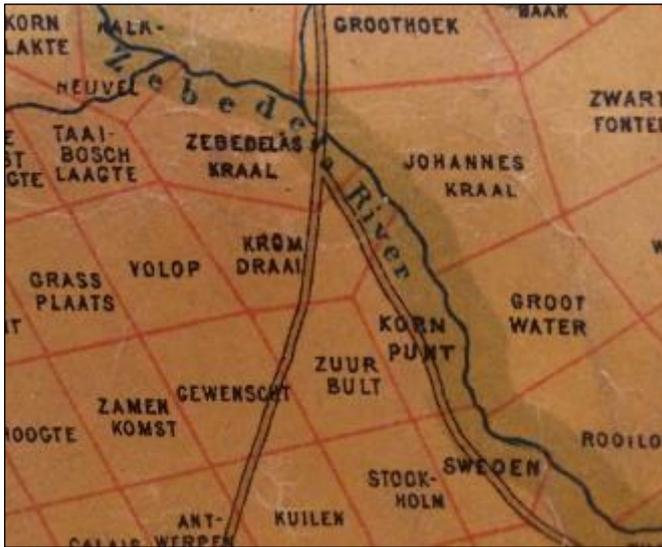
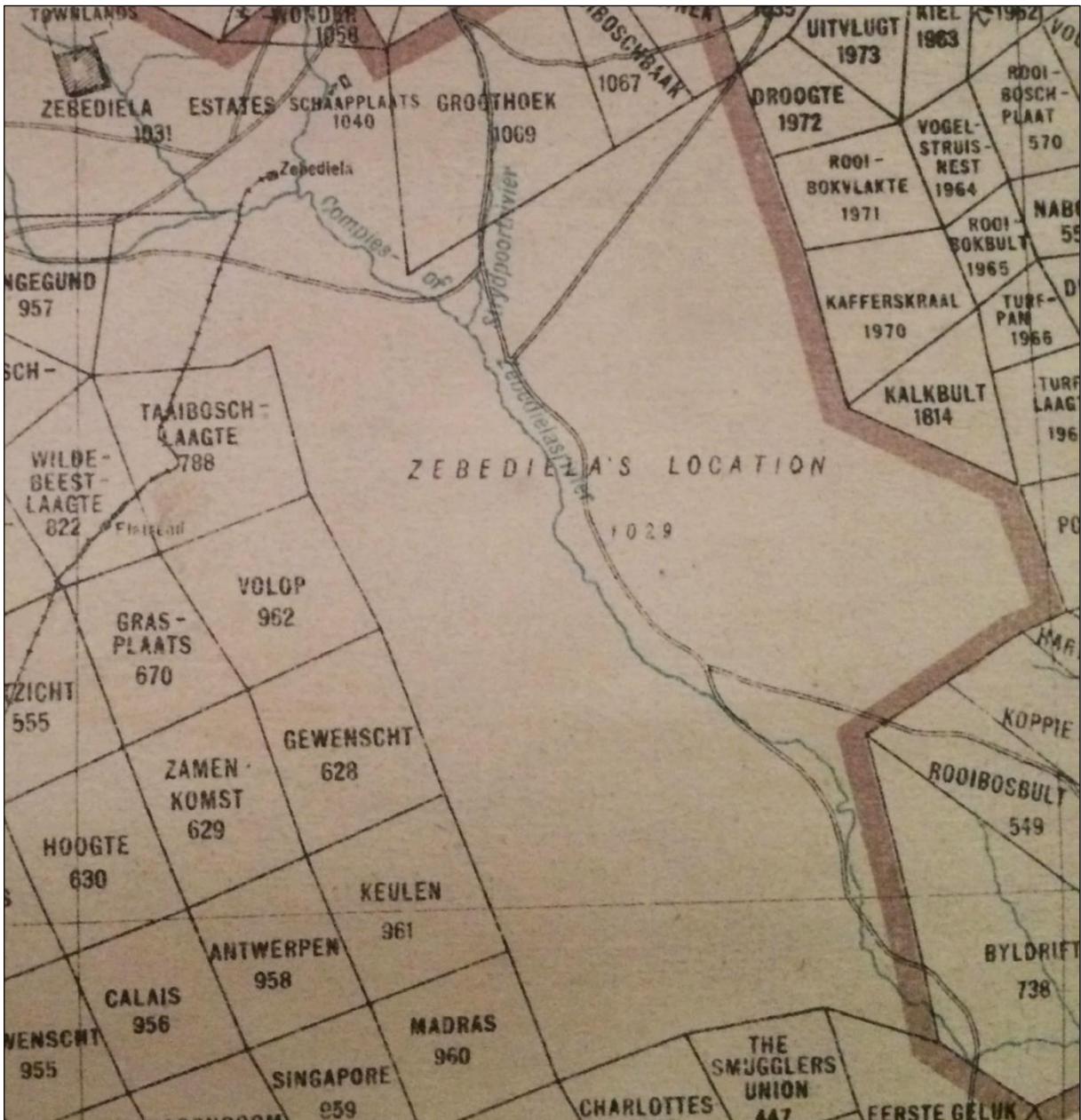


Figure 41 – The image on the left depicts sections of the Troye’s Map of the Transvaal that was compiled in 1896. The image below shows a section of the Map of the Transvaal Province that was compiled in 1931. Both maps are in the collection of PGS Heritage.



5.1.5 Zebediela Citrus Estate

Although the Zebediela Citrus Estate is located outside of the present study area, the closest point of the proposed study area is only 2.7 km south of the estate. Furthermore, the history of the landscape within which the study area is located is inseparably intertwined with the history of the Zebediela Citrus Estate, which became one of the biggest citrus estates in the country.

In 1917 a massive tract of land adjacent to Zebediela's Location was purchased by African Realty Trust, a company owned by I. W. (Issy) Schlesinger. Schlesinger was an extremely successful Insurance broker from America who came to South Africa in 1902 (<http://www.historicalpapers.wits.ac.za/>).

This purchase resulted in the establishment of the Zebediela Citrus Estate. Development of the estate began immediately with bush-clearing projects, dam building and soil preparation. The first trees were planted in 1918 and within a decade, nine square miles of orange trees had been planted, the fruit of which was already entering the export market. Schlesinger's agents were mandated to invite investors locally and overseas to finance the scheme by purchasing 5-acre stands. This allowed the company to assume responsibility. A commission for producing the crop was furthermore also appointed (<http://www.historicalpapers.wits.ac.za/>).

Combrink (1954) indicates that that some of these initial activities included the construction of nearly 200 miles of roads, the erection of accommodation for both white and black staff members, the construction of a packhouse and the excavation of a multitude of irrigation furrows.

In 1928 a railway line was built between the then Naboomspruit (Mookgopong) and Zebediela (Bergh, 1999) to allow for the quicker transportation of the fruit from the estate to the markets further afield. Internal railway lines were also built between the orchards and the packing house (Combrink, 1954).

By the early twentieth century three thousand black workers were employed at Zebediela. At the time, the estate's management reported that the supply of labour on the estate was plentiful, and as a result was prepared to accept a wage of roughly 25 shillings per month, excluding provisions. During the 1930s however, the demand and competition for labour increased as migrants sought the more favourable labour markets of the Witwatersrand. The shortage of labour at Zebediela became acute. The management of Zebediela was now obliged to recruit labour further afield through the established recruiting agencies operating from Messina, the Mozambican border, and across the

Limpopo. Thus from the mid-1930s, the bulk of Zebediela's labour was drawn from Nyasaland (present day Malawi), Portuguese East Africa (present day Mozambique) and Northern Rhodesia (present day Zambia). As desertion rates were high amongst the new migrant labourers, their arrival provided no long term solution to the labour shortage. This high rate of desertion was mainly due to the onerous work, low wages and poor living conditions at the estate at the time. Indeed, a managerial report recorded the opinion of a Department of Native Affairs Representative in the late 1930s who '*...condemned our old compounds as uncomfortable, insanitary and likely to become a disgrace if ever we had a serious outbreak of disease...*' (<http://www.historicalpapers.wits.ac.za/>).

Subsequently, in the 1940s, much effort was expended in devising living conditions compatible with labour stabilisation and economic rationality. Particularly valuable was the input of P. J. Quin, Director of the estate from 1936 to 1965, who was a person highly regarded by the Nationalist government. On the basis of the findings of Quin's sociological study of the Bapedi, the accommodation and diet of Black workers on the estate were improved considerably (<http://www.historicalpapers.wits.ac.za/>).

For many years the estate also relied on white female seasonal labour, employed as packers and graders during the annual packing season. Drawn largely from the local community, these women, aged between 16 and 45, were accommodated within a hostel in which the virtues of thrift, propriety and Christianity were encouraged. In the mid 1950s, economic rationality dictated that a transition be made from white to black seasonal female labour (<http://www.historicalpapers.wits.ac.za/>).

In 1953 ownership of Letaba was transferred from Letaba Estates Ltd, to another Schlesinger holding company, the African Irrigated Land Company Ltd (AILCO). In 1967, Consolidated Citrus Estates (CCE) took over the management of Letaba and Zebediela from AILCO and African Realty Trust (ART) respectively, with the effect of concentrating all citrus production under one company. Valencia Estates, adjacent to Letaba, joined the fold in 1965 (<http://www.historicalpapers.wits.ac.za/>).

One body which remains enigmatic is the Native Farmers Association of Africa. Formed in 1912 by one of the founders of the African National Congress, Pixley ka Isaka Seme, the company was originally floated to enable Black Africans to buy land before the promulgation of the Native Land Act of 1913. Within months, the company ran into financial difficulties, and was obliged to accept a partnership with Schlesinger. This arrangement with the Native Farmers Association of Africa was to benefit Schlesinger greatly (<http://www.historicalpapers.wits.ac.za/>).

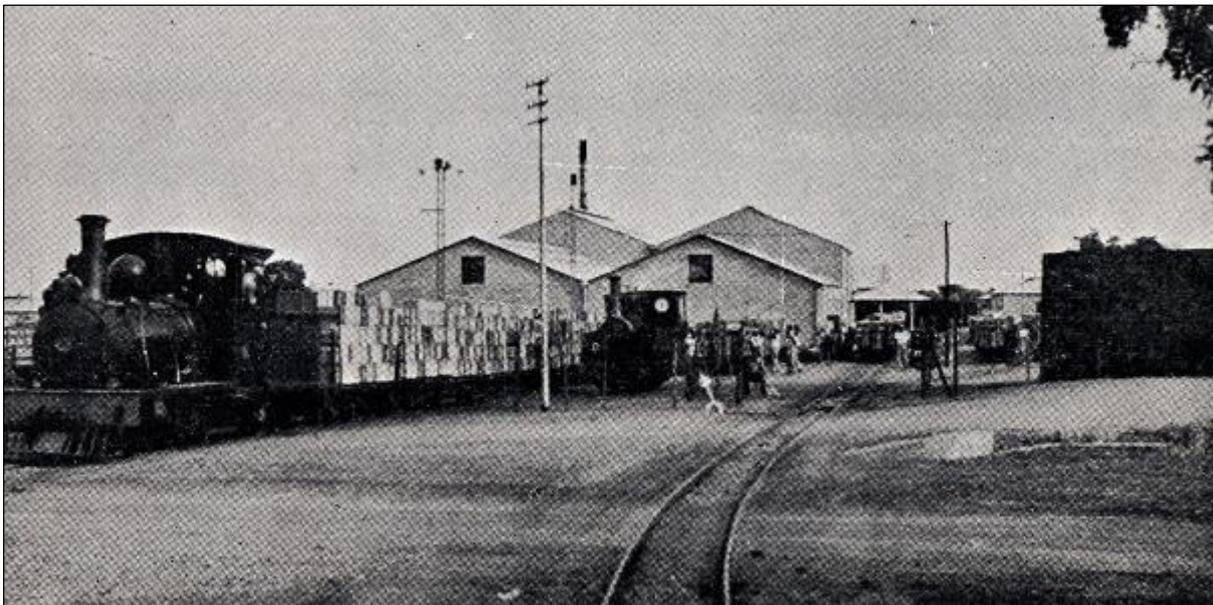


Figure 42 – Historic images of the Zebediela Citrus Estate. These illustrations depict the early plantings of citrus trees (top left), mule drawn dusting machines used in the orchard (top right), the original packing shed (middle) as well as the railway line between the citrus orchard and a later packing shed (bottom) (Combrink, 1951, 143 and 154)

5.2 Previous Heritage Impact Assessment Reports

A search of the South African Heritage Resources Information System database (<http://www.sahra.org.za/sahris>), identified several previous HIA's undertaken within the wider area. A selection of previous studies for the area is listed in chronological order below:

- **Roodt, F. 2007. A Cultural Heritage Scoping Report for a Proposed Filling Station at Mmakotse Village, Lepelle Nkumpi Local Municipality. For Tshifihwa & Associates Geo-Environmental Consultants.**

A Cultural Heritage Scoping Report was undertaken by Vhufa Hashu Heritage Consultants (Dr. Frans Roodt) for a proposed filling station at Mmakotse Village.

No heritage sites were identified during the study.

The project area is situated approximately 9.4 km north-east of the study area.

- **Pistorius, J.C.C. 2009. A Phase I Heritage Impact Assessment (HIA) Study for Lonmin's Proposed new Dwaalkop Mining Operation near Lebowakgomo in Chuniespoort in the Limpopo Province of South Africa.**

A Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) was carried out for Lonmin's proposed new Dwaalkop Mining Operation near Lebowakgomo in Chuniespoort in the Limpopo Province.

The study revealed lithics (primarily Middle Stone Age) along "*...a calcrete deposit which protrudes in the northern part of the Project Area as well as outside the Project Area*", Marked and Unmarked graves at an abandoned settlement known as Maneeng, as well as old mining sites with little infrastructure (Pistorius, 2009).

The study area for this project is located approximately 10 km north-east of the present study area.

- **Pistorius, J.C.C. 2011. A Phase I Heritage Impact Assessment (HIA) Study For Eskom's Proposed 132kv Power Lines Between the Gompies and DWAF02 Substations and between the Chromore and DWAF03 Substations on the northern edges of the Springbok Flats in the Limpopo Province.**

A Phase I Heritage Impact Assessment (HIA) study as required in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) was done for Eskom's proposed construction of 132kV power lines on the northern edges of the Springbok flats between Roedtan and Zebediela in the Limpopo Province. The construction of the proposed 132kV power lines between the Gompies and the DWAF02 Substations and between the Chromore and DWAF03 Substations is referred to as the Eskom Project whilst the footprint to be affected by the project is referred to as the Eskom Project Area. The Eskom Project Area is located between Roedtan in the south and Zebediela and Lebowakgomo in the north and as such falls within the northern edges of the Springbok flats in the Limpopo Province of South Africa. The existing Gompies Substation is located near the village of Mogoto in the north with the DWAF02 Substation further to the south, on the southern shoulder of a secondary road which joins the R518 and which runs between Naboomspruit (Mookgopong) and Mokopane further to the west. The existing Chromore Substation is located near the eastern shoulder of the R101 which links Mokopane with Polokwane whilst the DWAF03 Substation is located further to the east on the shoulder of the secondary road that joins the R518.

The Phase I HIA study for the proposed Eskom Project did not reveal the presence of any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) in the Eskom Project Area.

While components of the project study area is located approximately 33 km west and south-west of the current study area, the linear development included sections of land in the immediate surroundings of the present study area as well.

6 FIELDWORK FINDINGS

The fieldwork was conducted from 20 to 24 March 2016 by an experienced fieldwork team from PGS Heritage. Since the survey was limited to the 30 individual drilling borehole positions, each of these points were accessed on foot, a photograph taken of each drilling borehole position and its general characteristics recorded. A walkthrough of each footprint area was then carried out by the fieldwork team.

The PGS Heritage fieldwork team comprised a professional archaeologist with 18 years experience in heritage and archaeological impact assessment, namely Polke Birkholtz, and a fieldwork assistant with nearly five years experience in archaeological fieldwork. They fieldwork team was accompanied on three of the four fieldwork days by long-term resident of Zebediela, Mr Simon Ledimo Mafakane, who was assigned to the fieldwork team by Mr Rodney Kekana, the son of the Kgosi and also the client.

As agreed with the client, each footprint area was defined as a circular area around each drilling borehole position with a radius of 50 m between the central drilling borehole position and the outside periphery of the circular area. These footprint areas were covered on foot by the fieldwork team in a circular fashion around the central borehole position. Whenever heritage sites were identified within these footprint areas, written descriptions, photographs and GPS coordinates were recorded.

The fieldwork has shown that vegetation was very dense at several of the borehole drilling positions. One of the drilling borehole positions was completely inaccessible due to extremely dense vegetation (BH29), whereas another drilling borehole position (BH24) was accessed but could not be surveyed due to the dense vegetation found there.

The fieldwork team had two hand-held GPS devices with each member of the fieldwork team carrying such a device during the fieldwork. In this manner, tracklogs were recorded of the routes followed during the fieldwork. In the Garmin Basecamp maps provided below, these recorded track logs can be seen. As can be seen below, the first image is a wider view of all 30 the proposed drilling boreholes. Due to the extent of the overall area, this image does not show enough detail of the recorded track logs at each of the proposed drilling boreholes. As an example of the track logs recorded during the fieldwork at each of the drilling boreholes, recorded track logs for drilling boreholes BH1 to BH5 will be shown here.

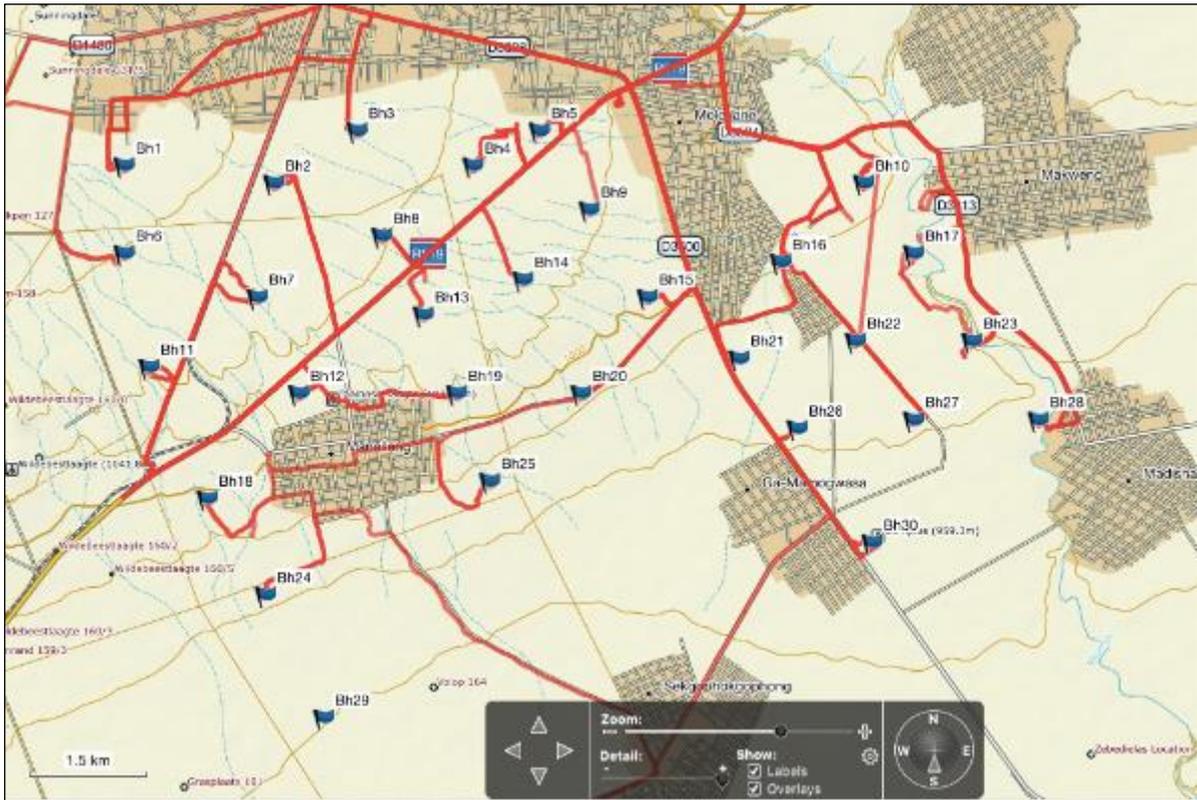


Figure 43 – Garmin Basecamp map depicting the overall area with the recorded track logs in red.

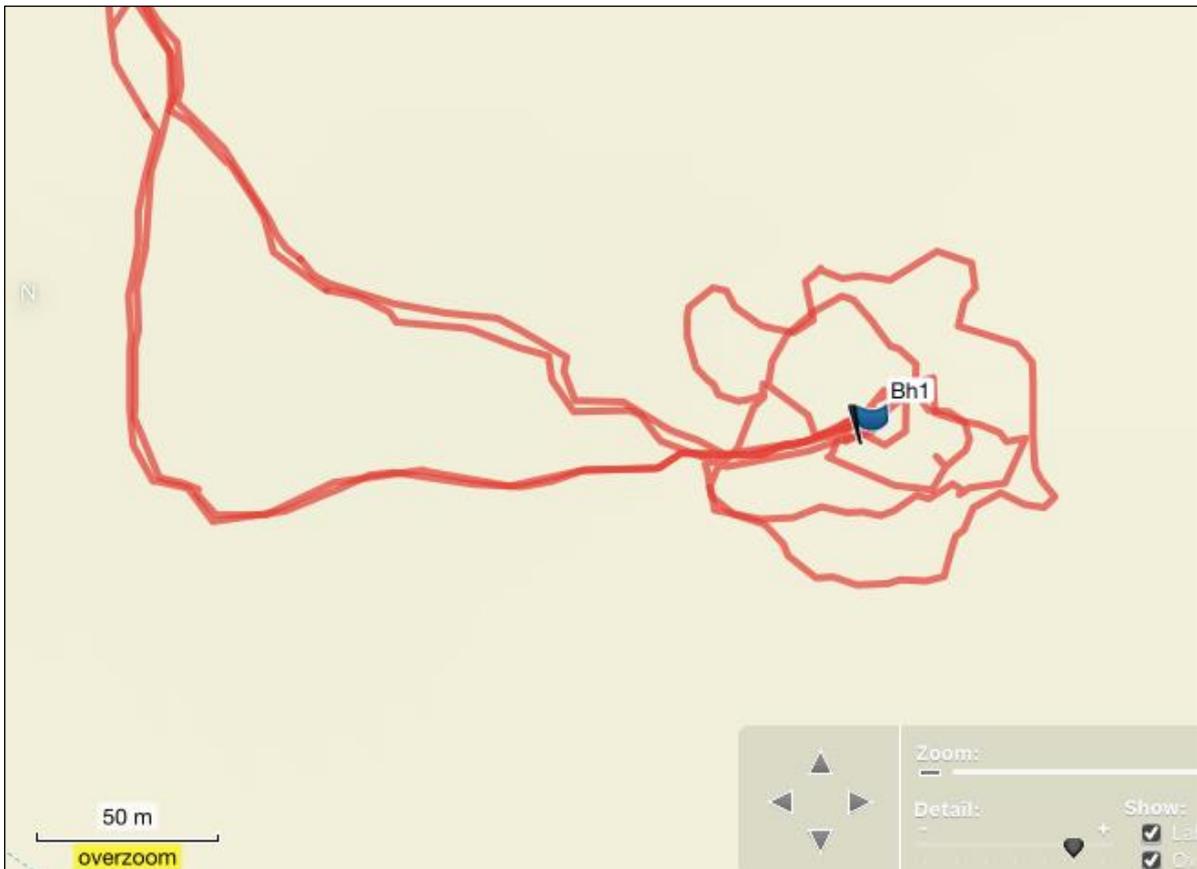


Figure 44 – The recorded track logs at drilling borehole BH1.



Figure 45 – The recorded track logs at drilling borehole BH2.

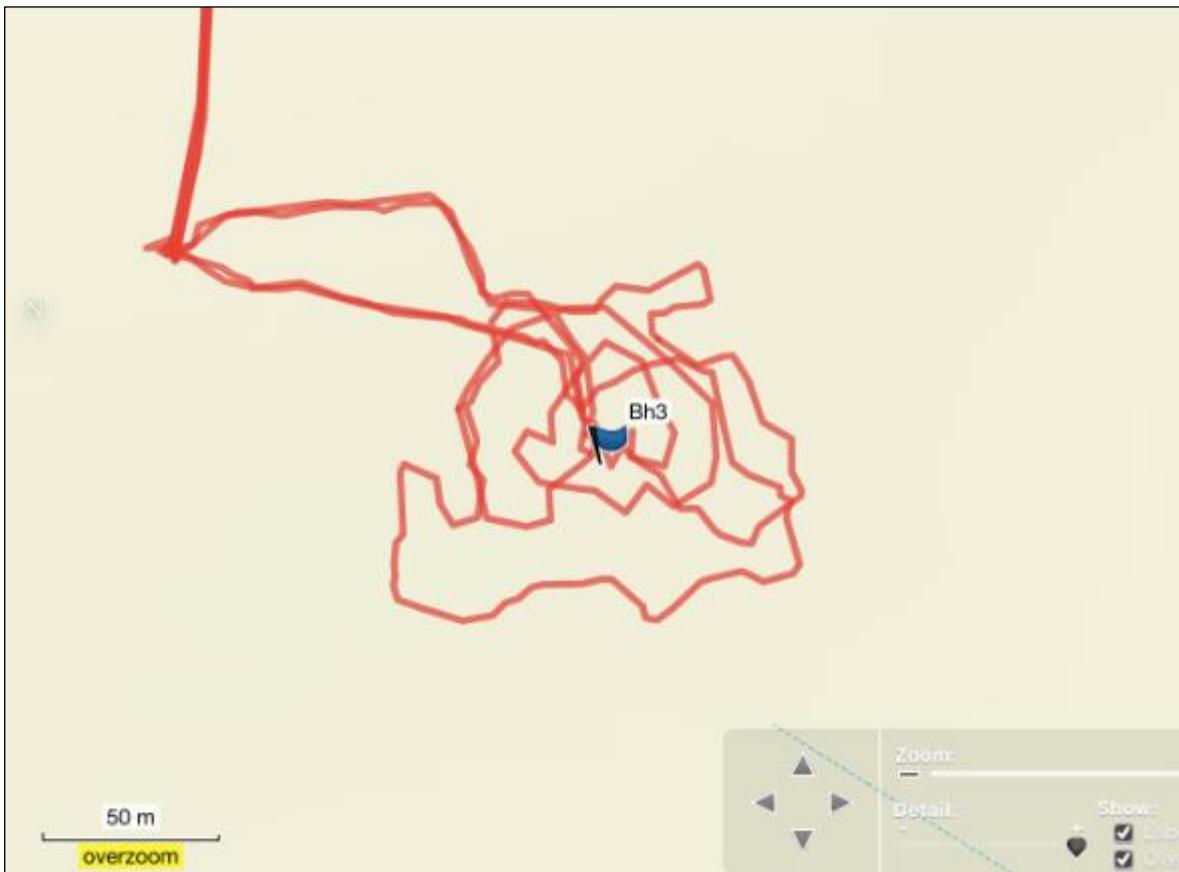


Figure 46 – The recorded track logs at drilling borehole BH2.

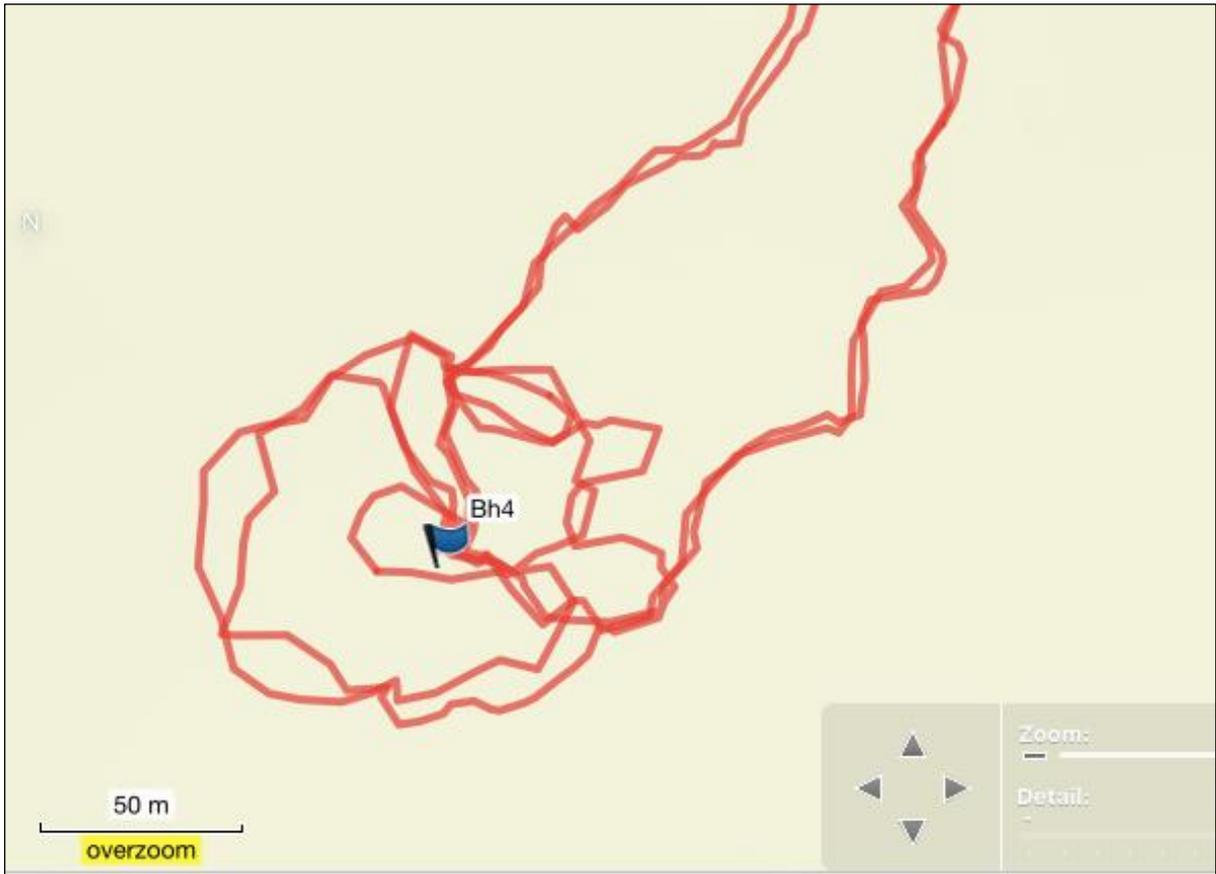


Figure 47 – The recorded track logs at drilling borehole BH4.

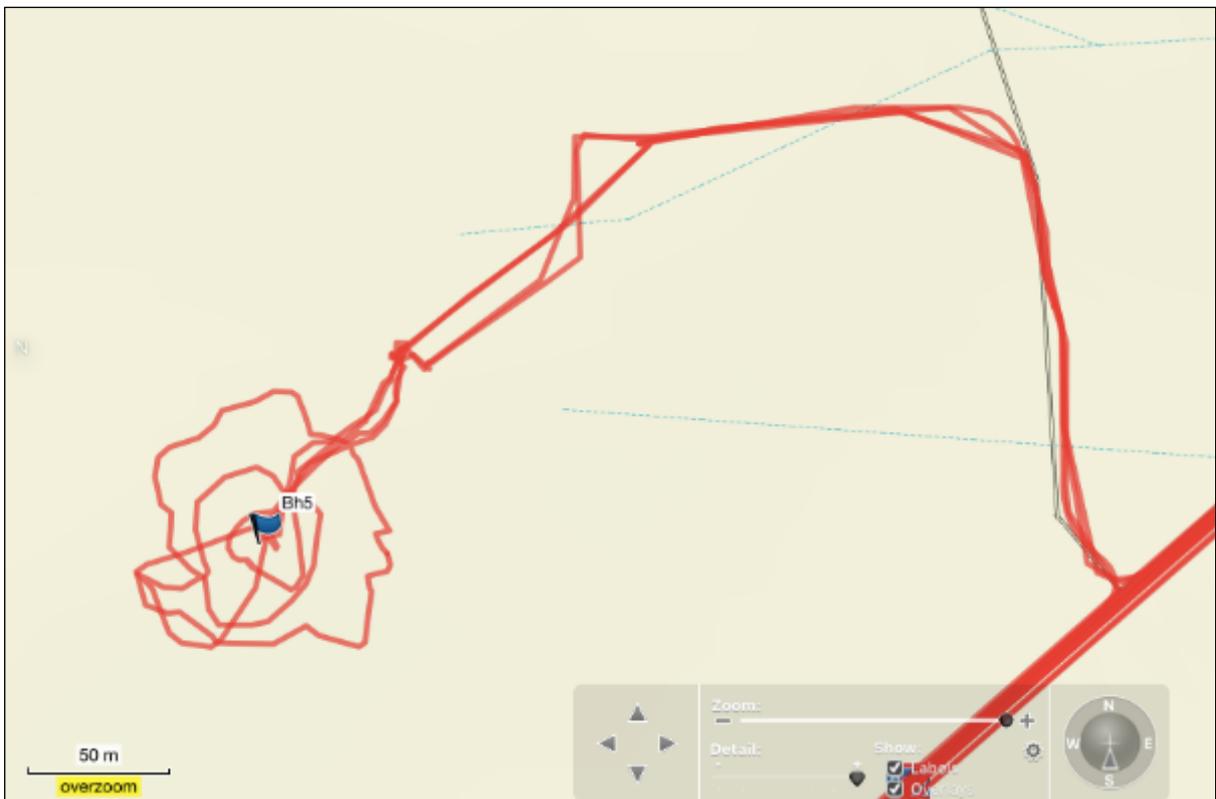


Figure 48 – The recorded track logs at drilling borehole BH4.

6.1 Heritage Sites identified in the Field

A total of 30 drilling borehole positions were surveyed. An area of 50 m radius around each drilling borehole point was surveyed on foot. A total of six heritage sites were identified at five of the drilling borehole positions, namely BH12, BH15, BH17, BH18 and BH21. No heritage sites were identified at any of the other drilling borehole positions.

In the five images that follow below, a Google Earth view of each of these five drilling borehole positions will be depicted. These depictions will show the position of the drilling borehole (in white), the position of identified heritage sites (red marker) and will also show the 50 m radius footprint around each of the drilling boreholes (in yellow).

Subsequently, a Garmin Basecamp map will be depicted which is a heritage site distribution map.



Figure 49 – Google Earth view of the identified heritage site (red polygon) at drilling borehole BH12 (white marker). The yellow circle defines the drilling borehole footprint with a radius of 50 m.

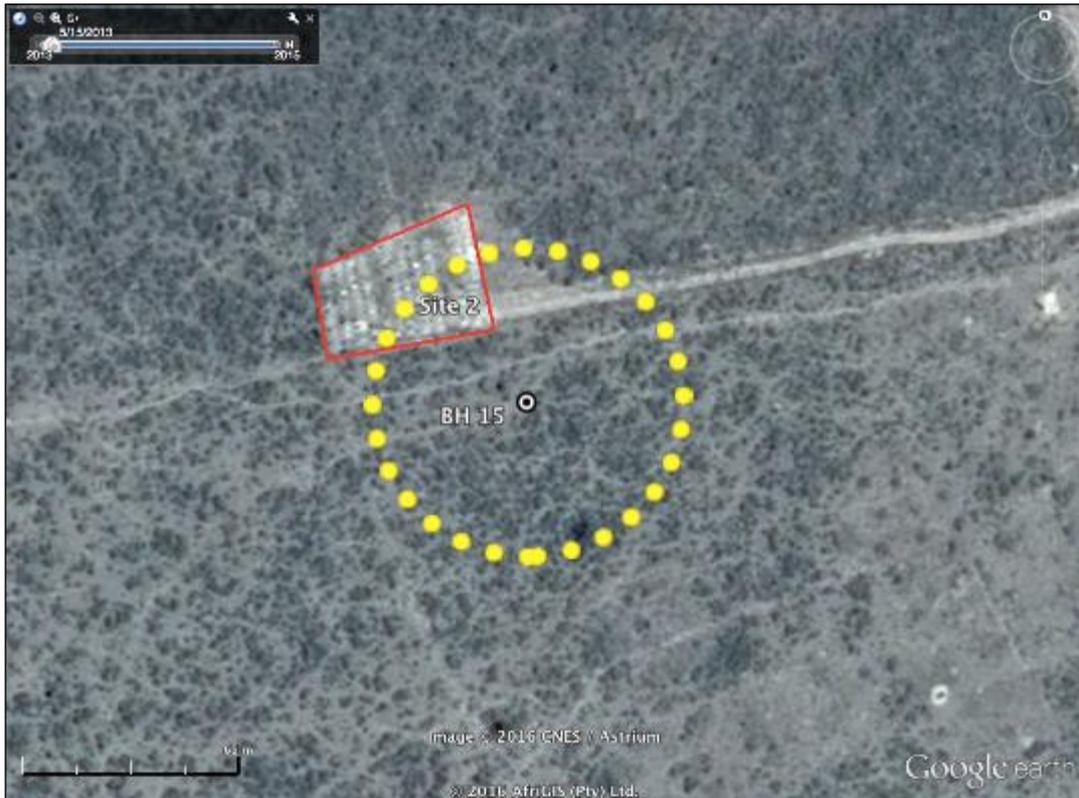


Figure 50 – Google Earth view of the identified heritage sites (red polygon) at drilling borehole BH15 (white marker). The yellow circle defines the drilling borehole footprint with a radius of 50 m.



Figure 51 – Google Earth view of the identified heritage sites (red markers) at drilling borehole BH17 (white marker). The yellow circle defines the drilling borehole footprint with a radius of 50 m.

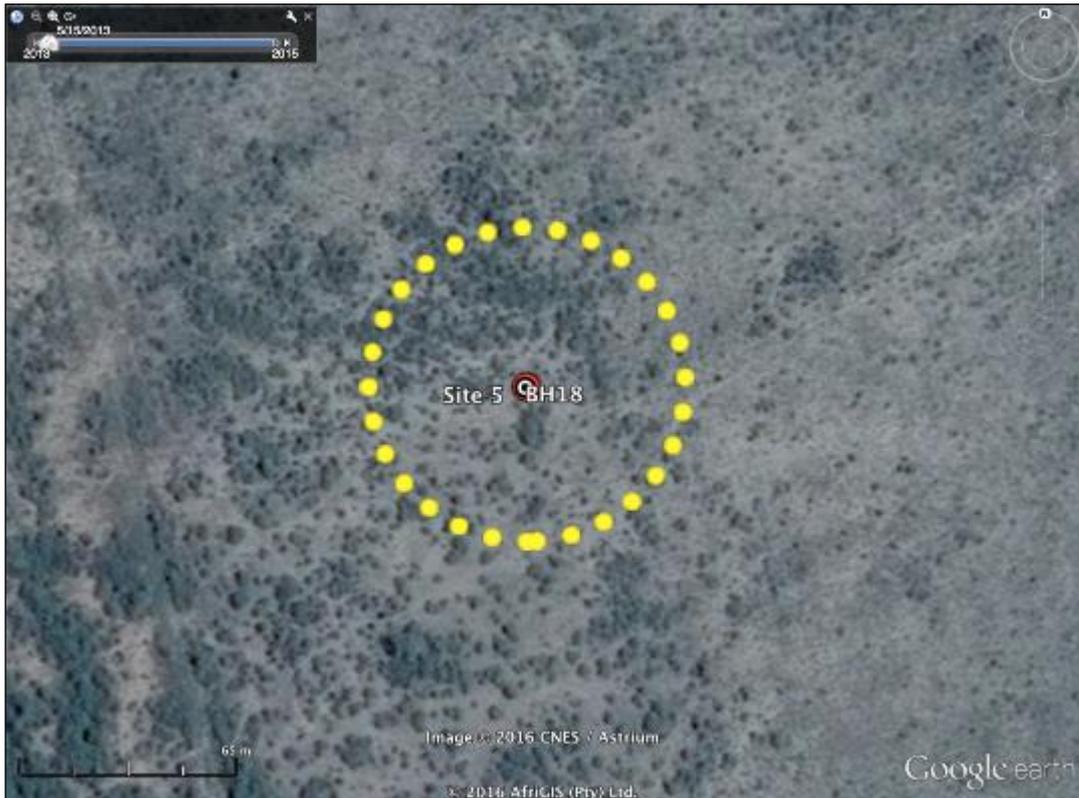


Figure 52 – Google Earth view of the identified heritage sites (red marker) at drilling borehole BH18 (white marker). The yellow circle defines the drilling borehole footprint with a radius of 50 m.



Figure 53 – Google Earth view of the identified heritage site (red marker) at drilling borehole BH21 (white marker). The yellow circle defines the drilling borehole footprint with a radius of 50 m.

6.1.1 Site 1

Borehole Drilling Position:

BH12

GPS Coordinates:

S 24.394000

E 29.283000

Site Description:

A low density surface scatter of Middle Stone Age lithics was identified over the footprint area of drilling borehole B12. Dolerite, quartzite, quartz and jasper were used in the manufacture of the lithics.

The density of material is very low, with only six lithics identified over an area of roughly 50 m x 50 m in extent.

The site is located on a generally level portion of land on top of a calcrete ridge. Although some vegetation in the form of *Acacia spp.* thornveld occur on site, the vegetation is very sparse. This lack of dense vegetation suggests that the footprint area had been cleared for residential purposes in the past. The site is located immediately north of a settlement known as Manaileng, so some disturbance may have taken place.

Site Significance:

Since the density of material is extremely low, the site is considered to be of **Low Significance** and no mitigation will be required. The rating is **Generally protected 4C**.



Figure 55 – General view of the site.



Figure 56 – Examples of the lithics found at BH12. Scale in 1cm increments.

6.1.2 Site 2

Drilling Borehole Position:

BH15

GPS Coordinates:

S 24.38279

E 29.32491

Site Description:

Site 2 comprises a cemetery which is located roughly 25 m north of the centre point of drilling borehole BH15. The cemetery is located at the top of a calcrete ridge and is situated on the south-western end of the settlement known as Moseetlane.

The cemetery comprises a large number of graves, many with granite headstones. Furthermore, a number of the headstones comprise large granite memorials. Some of the family names that could be seen on these headstones and memorials include the names Kekana and Matlaila.

While the exact age of the cemetery is not presently known, its first appearance on Google Earth Pro using the Historical Imagery function is 27 October 2013, with the extent of the cemetery increasing over subsequent satellite imagery. The cemetery is clearly still utilised as a designated burial ground by the community today. At the time of the fieldwork a team of people were in the process of erecting a new memorial on one of the graves.

The cemetery is completely fenced and has a gated entrance on its eastern end with a gravel road providing access to the cemetery from the east.

As the cemetery is located only 25 m from the drilling borehole position, with a significant component of the drilling borehole footprint located within the cemetery, it is strongly recommended that drilling borehole BH15 not be used for any proposed prospecting work.

Site Significance:

Graves and burial grounds fall under various legislative protections, depending on factors such as where the graves are located as well as their age. Such legislation may include the National Heritage Resources Act 25 of 1999, the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925), the Human Tissue Act 65 of 1983, the Ordinance on Excavations (Ordinance no. 12 of 1980) as well as any local and regional provisions, laws and by-laws that may be in place.

Graves and burial grounds have high levels of emotional, religious and historical significance. As a result the site has a **Generally Protected A (GP.A) / Medium to High Significance**. This indicates that mitigation will be required.



Figure 57 – View of the cemetery at BH15

6.1.3 Site 3

Drilling Borehole Position:

BH17

Site 3 comprises three historical livestock farming structures including a sheep/goat dipping tank (Site 3-A), a cattle dipping tank (3-B) and the foundations of a reservoir (3-C).

Site 3-A

GPS Coordinates:

S 24.37802

E 29.35692

Site Description:

This site comprises an old sheep/goat plunge dip which consists of a deep circular tank as well as one angled rectangular exit ramp. The site is located eight meters south-west of the drilling borehole centre point.

The sides of the plunge dip were built with cross-bonded bricks covered with salt-cement plaster. The cross bonded bricks as well as the general appearance of the structure suggest that it is older than 60 years old.

While the exact history of the structure is not known, a file located at the National Archives in Pretoria (NTS, 10751, SE/N/11) may provide some information on the age and history of the structure. Time did not allow for the retrieval of this archival file. However, the listing of the file on the database located on the website of the National Archives (www.national.archives.gov.za) is titled "*Returns of Cattle and Sheep Dipping Tanks. Zebediela.*" that is dated to 1951 may in fact refer to the structures identified here.

Site Significance:

As the site is more than 60 years old, it falls under the general protections of the National Heritage Resources Act (25 of 1999). However, the site is certainly not very unique or in a good state of preservation. As a result, the site is deemed to be of **Low Significance** which equals a rating of **Generally Protected C (GP 4C)**.



Figure 58 – View of sheep/goat plunge dip at BH 17 (Site 3-1A)



Figure 59 – Another view of sheep/goat plunge dip at BH 17 (Site 3-A)



Figure 60 – Close-up view of the cross-bonded bricks covered with salt-cement plaster. This view is of the side of the exit ramp (Site 3-A).

Site 3-B

GPS Coordinates:

S 24.37795

E 29.35659

Site Description:

This site comprises a plunge dip for cattle and consists of a rectangular dip tank and exit ramp with rounded steps. At its closest point the site is located 36 m south-west of the drilling borehole centre point.

The exit ramp leads to a sloped concrete drainage area designed to return excess dipping fluid to the tank. A reservoir, storage bin and borehole are also associated with the plunge dip.

While the exact history of the structure is not known, a file located at the National Archives in Pretoria (NTS, 10751, SE/N/11) may provide some information on the age and history of the structure. Time did not allow for the retrieval of this archival file. However, the listing of the file on the database located on the website of the National Archives (www.national.archives.gov.za) is titled "*Returns of Cattle and Sheep Dipping Tanks. Zebediela.*" that is dated to 1951 may in fact refer to the structures identified here. If so, this file would indicate that the structures are at least 65 years old.

Site Significance

As the site is more than 60 years old, it falls under the general protections of the National Heritage Resources Act (25 of 1999). However, the site is certainly not very unique or in a good state of preservation. As a result, the site is deemed to be of **Low Significance** which equals a rating of **Generally Protected C (GP 4C)**.



Figure 61 – General view of Site 3-B, showing the drainage area (front), reservoir base (top right), plunge tank (back) and storage bin (top left).



Figure 62 – View of the cattle plunge dipping tank and exit ramp (Site 3-B).

Site 3-C

GPS Coordinates:

S 24.37773

E 29.35673

Site Description:

The circular concrete foundation of a second reservoir with a borehole is located here. This structure would have been associated with the other two structures. As a result, it is clear that this structure may also be older than 60 years. The site is located 40 m north-west of the drilling borehole centre.

Site Significance:

As the site is more than 60 years old, it falls under the general protections of the National Heritage Resources Act (25 of 1999). However, the site is certainly not very unique or in a good state of preservation. As a result, the site is deemed to be of **Low Significance** which equals a rating of **Generally Protected C (GP 4C)**.



Figure 63 – View of the concrete reservoir base (Site 3-C).

6.1.4 Site 4

Drilling Borehole Position:

BH17

GPS Coordinates:

S 24.37780

E 29.35732

Site Description:

The site consists of an extensive Middle Stone Age surface concentration and contains the highest density of lithics of all sites identified during the fieldwork. The highest density that could be seen across the site is five lithics per 1m², with roughly 30 lithics per 10m². Quartzite and jasper were primarily used in the manufacture of the lithics identified at the site.

The site extends over an area of at least 50 m x 50 m from the edge of the red sand continuing on towards the gravel banks on the western bank of the Nkumpi River. While only a small number of lithics were identified on the red sand, the extensive erosion observed along the gravel banks of the river appears to have exposed the lithics located on these gravel banks. It can be assumed that the site extends almost all the way to the river below.

At its closest point, the site is situated between 35 m from the centre point of the drilling borehole and continues through and beyond the footprint area on its north-eastern end. Furthermore, the site extends for at least 50 m along the width of the river bank.

Site Significance:

Due to the high density of the lithics the site is considered to be of Medium significance. Mitigation measures will be required. The site is rated as **Generally protected B (4B)**.



Figure 64 – General view of the landscape (Site 4).



Figure 65 – Sample of lithics observed on the surface of Site 4. Scale in 1 cm increments.

6.1.5 Site 5

Drilling Borehole Position:

BH18

GPS coordinates:

S 24.406000

E 29.272000

Site Description:

A low density scatter of ESA and/or MSA lithic material was identified on top of a hill. These lithics are quite rudimentary and no well-made or retouched lithics were identified. The highest density of lithics seen anywhere on the site is only one lithic per m², with an estimated average across the site of roughly one lithic per 5m². A preference for quartzite in the manufacture of the lithics from the site appears evident.

Lithics were identified across the drilling borehole footprint, and as a result the extent of the site is estimated to be at least 100 m x 100 m. However, in no instance could any clear concentration of lithics be identified.

Site significance:

Due to the low density and the rudimentary nature of the lithics, the site is considered to be of **Low Significance**. No mitigation is required. The significance rating is **Generally protected 4C**.



Figure 66 – General view of Site 5.



Figure 67 – Sample of lithics observed on the surface of Site 5.

6.1.6 Site 6

Drilling Borehole Position:

BH21

GPS Coordinates:

S 24.38991

E 29.33588

Site Description:

This site comprises a surface scatter of Stone Age material. The lithics occur on both sides of a fence that bisects the footprint area, within a maize field. A preference for quartzite, quartz, dolerite and banded ironstone in the manufacture of the lithics at the site appears evident. It is clear that the Stone Age material observed on the surface of the site had been exposed by ploughing activities. The density of the material is less than one lithic per square meter.

One Early Stone Age handaxe was identified here, as well as a number of flakes and three smaller cores likely associated with the Middle and Later Stone Ages. In total, no less than 20 or so lithics were observed in an area of 25 x 25 square meters. The lithics were found all around the drilling borehole position at BH21 and will be affected by this footprint.

One undecorated ceramic was also identified on the surface of the site. With agricultural activities still taking place on the maize field, it can be assumed that the ceramic was deposited here in relatively recent years.

Site significance:

Due to the presence of Early Stone Age material, as well as the presence of a number of lithics on the surface of the site, the site is considered to be of **Medium Significance**. Mitigation measures will be required. The site is rated as **Generally protected B (4B)**.



Figure 68 – General view of the site as well as the lithics identified here. The locality where the Early Stone Age handaxe was found is shown (below right), with samples of lithics identified at the site (top and bottom left)

7 IMPACT OF PROPOSED DEVELOPMENT ON HERITAGE RESOURCES

In this section the impact of the proposed development on the study area will be calculated.

7.1 Introduction

A total of six heritage sites were identified during the fieldwork carried out by PGS Heritage in 2016. These identified sites were numbered from Site 1 to Site 6.

In the section that follows, impact risk assessments will be undertaken on these sites.

7.2 Risk Calculation for the Impact of the Proposed Development on Site 1

In this section the impact of the proposed development on Site 1 will be established. As discussed in the site description above, the site's lithics were found scattered all around the drilling borehole's centre point. As a result, it is clear that the site will be destroyed by the proposed utilisation of BH12.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(1 + 1 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 1.87

Table 10: Risk Calculation for the Development Impact on Site 1

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Very Low	Site	Permanent	Very Likely	Low
Impact on Site 1	1	1	5	4	1.87

This calculation has revealed that the impact risk of the proposed development on Site 1 falls within Impact Class 2, which represents a Low Impact Risk. No mitigation is required.

7.3 Risk Calculation for the Impact of the Proposed Development on Site 2

In this section the impact of the proposed utilisation of BH12 on Site 2 will be established. As indicated in the site description, an extensive cemetery is located 25 m from the centre point of this drilling borehole. As a result, should BH15 be utilised and development, some measure of impact can be expected on the cemetery and the graves that it contains.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(4 + 4 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 3.47

Table 11: Risk Calculation for the Development Impact on Site 2

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	High	Regional	Permanent	Very Likely	High
Impact on Site 2	4	4	5	4	3.47

This calculation has revealed that the impact risk of the proposed development on Site 2 falls within Impact Class 4, which represents a High Impact Risk. The only option would be for this drilling borehole not to be utilised.

7.4 Risk Calculation for the Impact of the Proposed Development on Site 3

In this section the impact of the proposed development on Site 3 will be established. This includes Site 3-A, 3-B and 3-C. As indicated, these three sites are located at distances 8 m, 35 m and 40 m from the drilling borehole's centre point. As a result, the development of this drilling borehole will have an impact on these sites.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(1 + 1 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 2.13

Table 12: Risk Calculation for the Development Impact on Site 3

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Very Low	Site	Permanent	Very Likely	Low
Impact on Site 3	1	1	5	4	1.87

This calculation has revealed that the impact risk of the proposed development on Site 3 falls within Impact Class 2, which represents a Low Impact Risk. No mitigation is required.

7.5 Risk Calculation for the Impact of the Proposed Development on Site 4

In this section the impact of the proposed development on Site 4 will be established. As indicated in the site description above, the closest point of the site starts at a distance of 35 m from the drilling borehole's centre point, and extends down the bank of the river to its edge. As a result, the utilisation of this drilling borehole would have an impact on the site.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(3 + 2 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 2.67

Table 13: Risk Calculation for the Development Impact on Site 4

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Moderate	Study Area	Permanent	Very Likely	Moderate
Impact on Site 4	3	2	5	4	2.67

This calculation has revealed that the impact risk of the proposed development on Site 4 falls within Impact Class 3, which represents a Moderate Impact Risk. Mitigation is required.

7.6 Risk Calculation for the Impact of the Proposed Development on Site 5

In this section the impact of the proposed development on Site 5 will be established. As discussed in the site description above, the site’s lithics were found scattered all around the drilling borehole’s centre point. As a result, it is clear that the site will be destroyed by the proposed utilisation of BH18.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(1 + 1 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 1.87

Table 14: Risk Calculation for the Development Impact on Site 5

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Very Low	Site	Permanent	Very Likely	Low
Impact on Site 5	1	1	5	4	1.87

This calculation has revealed that the impact risk of the proposed development on Site 5 falls within Impact Class 2, which represents a Low Impact Risk. No mitigation is required.

7.7 Risk Calculation for the Impact of the Proposed Development on Site 6

In this section the impact of the proposed development on Site 6 will be established. As discussed in the site description above, the site’s lithics were found very close to the drilling borehole’s centre point, and also almost all over the footprint. It is clear that the utilisation of this drilling borehole will have an impact on the site.

$$\text{Impact Risk} = \frac{(\text{Significance} + \text{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

$$\text{Impact Risk} = \frac{(3 + 3 + 5)}{3} \times \frac{4}{5}$$

IMPACT RISK = 2.93

Table 15: Risk Calculation for the Development Impact on Site 6

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Moderate	Local	Permanent	Very Likely	Moderate
Impact on Site 6	3	3	5	4	2.93

This calculation has revealed that the impact risk of the proposed development on Site 6 falls within Impact Class 3, which represents a Moderate Impact Risk. Mitigation is required.

8 MITIGATION MEASURES AND GENERAL RECOMMENDATIONS

The risk calculation above has shown that the impact of the proposed development on heritage resources in the study area falls in the following impact classes: Site 1 - Impact Class 2, Site 2 - Impact Class 4, Site 3 - Impact Class 2, Site 4 – Impact Class 3, Site 5 – Impact Class 2 and Site 6 – Impact Class 3

8.1 Mitigation Measures Required For Site 1

As the impact risk calculation has revealed that the impact of the proposed development on Site 1 falls in Impact Class 2, no mitigation measures are required.

8.2 Mitigation Measures required for Site 2

The impact risk calculation has revealed that the impact of the proposed development on Site 2 falls in Impact Class 4. It is evident that the proposed utilisation of the drilling borehole at BH15 will have a high impact on the cemetery. With the relocation of the cemetery not an option, the following mitigation measures are required:

- BH15 may not be utilised as an exploration drilling borehole.

8.3 Mitigation Measures required for Site 3

The impact risk calculation has revealed that the impact of the proposed development on Site 3 falls in Impact Class 2. As a result, no mitigation measures are required.

8.4 Mitigation Measures required for Site 4

The impact risk calculation has revealed that the impact of the proposed development on Site 4 falls in Impact Class 3. This means that mitigation would be required for the drilling borehole can be used. The following mitigation measures are required:

- Recording the site using accepted archaeological methods and techniques including the recording of a surface layout of the site using a Total Station.

- A surface collection of the lithics should be made.
- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

8.5 Mitigation Measures required for Site 5

As the impact risk calculation has revealed that the impact of the proposed development on Site 1 falls in Impact Class 2, no mitigation measures are required.

8.6 Mitigation Measures required for Site 6

The impact risk calculation has revealed that the impact of the proposed development on Site 6 falls in Impact Class 3. This means that mitigation would be required for the drilling borehole can be used. The following mitigation measures are required:

- As the lithics were exposed by ploughing activities, the suggestion is that any recording of the surface layout for only record the lithics in their secondary context.
- A surface collection of the lithics should be made.
- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

8.7 General Recommendations

The scope of work that PGS Heritage was appointed for, only entailed a Heritage Impact Assessment on 30 proposed drilling boreholes. None of the associated access roads located outside of each drilling borehole's footprint area formed part of this assessment and was therefore non assessed in the field.

During the fieldwork, assessments were made of the number of drilling boreholes located adjacent to existing roads (including two-track roads). The drilling boreholes which are located adjacent to such existing roads (which must be used by the drilling crews as access roads after the necessary mitigation had taken place at the sites requiring such mitigation), are as follows:

- Drilling Borehole BH3
- Drilling Borehole BH5
- Drilling Borehole BH9
- Drilling Borehole BH12
- Drilling Borehole BH15
- Drilling Borehole BH16
- Drilling Borehole BH19
- Drilling Borehole BH20
- Drilling Borehole BH21
- Drilling Borehole BH22
- Drilling Borehole BH23
- Drilling Borehole BH26
- Drilling Borehole BH28
- Drilling Borehole BH30

For the remainder of the drilling boreholes, access roads will have to be built. Once the footprints of these access roads are finalized and well before the commencement of construction activities, an experienced archaeologist / heritage specialist must be appointed to conduct a walkthrough of these footprints to ensure that no significant archaeological and heritage sites will be affected by the access roads.

9 CONCLUSIONS

PGS Heritage was appointed by the Centre for Environmental Management (CEM) to undertake a Heritage Impact Assessment (HIA) for the proposed utilisation of 30 proposed drilling boreholes that forms part of the proposed prospecting activities for the Moletlane Mining Project near Zebediela, Lepele-Nkumpi Local Municipality, Capricorn District Municipality, Limpopo Province.

Archival and Historical Desktop Study

The work commenced with an archival and historical desktop study. This study comprised an assessment of the available archival and historical maps as well as a compilation of a historic overview of the study area and surroundings.

As a result of the archival and historical desktop study, it was possible to identify the following historically significant aspects regarding the history of the study area and its immediate surroundings:

- The Kekana Ndebele of Moletlane has lived within the study area for centuries. The Kekana Ndebele originally came from present-day Kwazulu-Natal, before they settled near Randfontein (eMhlangeni), Pretoria (KwaMnyamana) and Belfast (KwaSimkhulu). The followers of Mthombeni left KwaSimkhulu and followed the Olifants River northward. On his way northwards, Mthombeni became known as Gegana (or Kekana) and his followers were referred to as the 'people of Gegana (or Kekana)'. The Kekana Ndebele established themselves at what is today known as Zebediela and founded a settlement known as Moletlane (or Moletlane), a name which still exists today. By the nineteenth century, the Kekana Ndebele community was one of the most prominent groups occupying the region in and around the project area and especially during the reign of Moletlane. His prominence grew during the war between the Boers and the BaPedi known as the Sekhukhune War of 1852. During the war, Moletlane assisted the Boers by providing them with 400 warriors as well as corn and cattle. This, and other acts of diplomacy by Moletlane, resulted in him being given the name 'Mabediela', which means 'The One Who Pacifies'. Zebediela is a corruption of this name.
- Tracing their origins to present-day Lesotho, the Batlokwa ba Mamarela a Bjatladi settled on the lower areas of the Mmabulepu Mountains (Strydpoort Mountains) during the early nineteenth century and named it Bjatladi. This land is located immediately north of the

present study area, and is where the Zebediela Citrus Estate is located. All three clans of the group, namely Tsoai, Mogoto and Mogotlane, settled here. It is clear that the settlement from within the study area known as Mogoto derives its name from this clan name. After the promulgation of the Native Lands Act of 1913, the Bjatladi residents were informed that a new citrus estate was going to be established on their land and they they had to work on the farm to have a right to live there. While some members of the community started working on the Zebediela Citrus Estate in fear of losing their homes, other members of the community refused and settled in the Kekana Ndebele land at settlements such as Makweng and Moseetlane. In 2003, the Bjatladi community's land restitution claim on the citrus estate was successful.

- The Voortrekker party of Louis Tregardt and Johannes Jacobus Janse (Lang Hans) van Rensburg passed through the surroundings of the study area on the way to the north. Their route led them through a poort in the Strydpoort Mountains, which is located a short distance north of the present study area. In the poort, the two Voortrekker leaders started quarreling and the two parties split up, giving the mountain its name. During the Great Trek Centenary Celebrations and Re-enactment Treks of 1938, a monument was erected in the Strydpoort Mountains adjacent to what is now known as the R519 tar road between Zebediela and Polokwane. This monument appears to still exist, and is located 11.43 km north-east of the study area's nearest point.
- Zebediela' Location, which forms part of the overall study area was formally assigned as a location for the Kekana Ndebele of Moletlane. This was in acknowledgement of the assistance provided to the Boers by Moletlane (also known as Mabediela, Sebitiela or Zebediela) during the war with Sekhukhune. In return for his show of loyalty, Zebediela were exempted from taxation in 1846 (this exemption was later revoked), and in 1885 a location was beaconed off by the Zuid Afrikaansche Republiek. This was named Zebediela's Location.
- Although the Zebediela Citrus Estate is located outside of the present study area, the closest point of the proposed study area is only 2.7 km south of the estate. Furthermore, the history of the landscape within which the study area is located is inseparably intertwined with the history of the Zebediela Citrus Estate, which became one of the biggest citrus estates in the country. The history of the estate started with the arrival of I.W. Schlesinger from America. Work on the estate started in 1917 and development of the Zebediela Citrus Estate began immediately with bush-clearing projects, dam building and soil preparation. The first trees were planted in 1918 and within a decade, nine square miles of orange trees had been planted, the fruit of which was already entering the export market. Other activities

undertaken initially included the construction of nearly 200 miles of roads, the erection of accommodation for both white and black staff members, the construction of a packhouse and the excavation of a multitude of irrigation furrows. In 1928 a railway line was built between the then Naboomspruit (Mookgopong) and the citrus estate, to allow for the quicker transportation of the fruit from the estate to the markets further afield. Internal railway lines were also built between the orchards and the packing house. In time, the Zebediela Citrus Estate became one of the largest citrus estates in South Africa.

Fieldwork Findings

A total of six heritage sites were identified at five of the drilling borehole positions: BH12, BH15, BH17, BH18 and BH21. No heritage sites were identified at any of the other drilling boreholes.

Site	Coordinates	Description	Significance
Site 1	S 24.394000 E 29.283000	A low density surface scatter of MSA lithics occurring over a significant component of the footprint area at drilling borehole BH12.	Low
Site 2	S24.38279 E29.32491	Fenced communal cemetery containing a large number of graves. The drilling borehole footprint area at BH15 encloses a section of the cemetery.	Medium to High
Site 3-A	S24.37802 E29.35692	Historical sheep/goat plunge dip with ramp. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 3-B	S24.37795 E29.35659	Historical plunge dip for cattle with exit ramp and associated reservoir, storage bin and borehole. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 3-C	S24.37773 E29.35673	The circular concrete foundation of a second reservoir with a borehole. The structure is believed to be older than 60 years. Located at BH17.	Low
Site 4	S24.37780 E29.35732	An extensive MSA surface concentration commencing well within the drilling borehole footprint at BH17.	Medium

Site 5	S 24.406000 E 29.272000	A low density surface scatter of ESA and MSA lithic material occurs all over the drilling borehole footprint at BH18.	Low
Site 6	S24.38991 E29.33588	A low density surface scatter of ESA, MSA and LSA lithic material occurs all over the drilling borehole footprint at BH21.	Medium

Assessments were made of the impact risk of the proposed development on the six identified heritage sites. These calculations have revealed that the impact risk on three sites (Site 1, Site 3 and Site 5) will fall within the Impact Class 2 range which represents a Low Impact Risk, two sites (Site 4 and Site 5) fall within the Impact Class 3 which is a Moderate Impact risk and one site (Site 2) falls in Impact Class 4 which is High impact risk. While no mitigation would be required for the sites falling with a Low Impact Risk, mitigation would be required for those with a Moderate and High Impact Risk.

Mitigation

The following mitigation measures would be required for the sites with a Moderate and High Impact Risk. Please note that all mitigation measures will be required well before the commencement of the Construction Phase / Exploration Phase.

Mitigation Measures required for Site 2:

It is evident that the proposed utilisation of the drilling borehole at BH15 will have a high impact on the cemetery. With the relocation of the cemetery not an option, the following mitigation measures are required:

- BH15 may not be utilised as an exploration drilling borehole.

Mitigation Measures required for Site 4:

The following mitigation measures are required:

- Recording the site using accepted archaeological methods and techniques including the recording of a surface layout of the site using a Total Station.

- A surface collection of the lithics should be made.
- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

Mitigation Measures required for Site 6:

The following mitigation measures are required:

- As the lithics were exposed by ploughing activities, the suggestion is that any recording of the surface layout for only record the lithics in their secondary context.
- A surface collection of the lithics should be made.
- In addition, an investigation through Shovel Test Pits (STP's) would establish whether subsurface deposits are present. Depending on the outcomes of this investigation, further mitigation measures such as the archaeological excavation of the site may be required.
- A Phase 2 Archaeological Mitigation report must be compiled.
- The abovementioned report and destruction permit application must be lodged with the South African Heritage Resources Agency (SAHRA).
- The mitigation proposed here may only be undertaken under the auspices of a suitably qualified and experienced Stone Age specialist. It must also be preceded by the application and receipt of the necessary archaeological mitigation permit from SAHRA.

General Recommendations

The scope of work that PGS Heritage was appointed for, only entailed a Heritage Impact Assessment on 30 proposed drilling boreholes. None of the associated access roads located outside of each drilling borehole's footprint area formed part of this assessment and was therefore non assessed in the field.

During the fieldwork, assessments were made of the number of drilling boreholes located adjacent to existing roads (including two-track roads). The drilling boreholes which are located adjacent to such existing roads (which must be used by the drilling crews as access roads after the necessary mitigation had taken place at the sites requiring such mitigation), are as follows:

- Drilling Borehole BH3
- Drilling Borehole BH5
- Drilling Borehole BH9
- Drilling Borehole BH12
- Drilling Borehole BH15
- Drilling Borehole BH16
- Drilling Borehole BH19
- Drilling Borehole BH20
- Drilling Borehole BH21
- Drilling Borehole BH22
- Drilling Borehole BH23
- Drilling Borehole BH26
- Drilling Borehole BH28
- Drilling Borehole BH30

For the remainder of the drilling boreholes, access roads will have to be built. Once the footprints of these access roads are finalized and well before the commencement of construction activities, an experienced archaeologist / heritage specialist must be appointed to conduct a walkthrough of these footprints to ensure that no significant archaeological and heritage sites will be affected by the access roads.

Conclusions

On the condition that the mitigation measures and general recommendations outlined in this report are undertaken, any development impacts on the identified heritage sites will be suitably mitigated to allow the development to take place. As such, and on this condition, no heritage reasons can be given for the development not to continue.

10 PREPARERS

Polke Birkholtz - Project Manager / Author

Jennifer Kitto - Heritage Specialist / Co-Author

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11.4 Internet Sources

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www.wikipedia.org

11.5 National Geo-Spatial Information, Department of Rural Development

The historic aerial photographs and topographic maps were all obtained from National Geo-Spatial Information at the Department of Rural Development in Cape Town.

11.6 Google Earth and Google Earth Pro

All contemporary aerial views used in this report were obtained using Google Earth and Google Earth Pro. This is true for overlays made as well.

11.7 Garmin Basecamp

Some of the contemporary maps were made using Garmin's Basecamp software.

Appendix A

LEGISLATIVE REQUIREMENTS – TERMINOLOGY AND ASSESSMENT CRITERIA

1. GENERAL PRINCIPLES

In areas where there has not yet been a systematic survey to identify conservation-worthy places, a permit is required to alter or demolish any structure older than 60 years. This will apply until a survey has been completed and identified heritage resources are formally protected.

Archaeological and palaeontological sites, materials, and meteorites are the source of our understanding of the evolution of the earth, life on earth and the history of people. In terms of the heritage legislation, permits are required to damage, destroy, alter, or disturb such sites. People who already possess such material are required to register it. The management of heritage resources is integrated with environmental resources and this means that before development takes place heritage resources are assessed and, if necessary, rescued or mitigated.

In addition to the formal protection of culturally significant graves, all graves which are older than 60 years and are not in a cemetery (such as ancestral graves in rural areas) are protected. The legislation protects the interests of communities who have an interest in the graves: they must be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle should be identified, cared for, protected and memorials erected in their honour.

Anyone who intends to undertake a development must notify the heritage resource authority and if there is reason to believe that heritage resources will be affected, an impact assessment report must be compiled at the applicant's (i.e. mining company or development company) cost. Thus, the applicant will be able to proceed without uncertainty about whether work will have to be stopped if an archaeological or heritage resource is discovered.

According to the National Heritage Act (Act 25 of 1999 section 32) it is stated that:

An object or collection of objects, or a type of object or a list of objects, whether specific or generic, that is part of the national estate and the export of which SAHRA deems it necessary to control, may be declared a heritage object, including –

- objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects, meteorites and rare geological specimens;
- visual art objects;
- military objects;

- numismatic objects;
- objects of cultural and historical significance;
- objects to which oral traditions are attached and which are associated with living heritage;
- objects of scientific or technological interest;
- books, records, documents, photographic positives and negatives, graphic material, film or video or sound recordings, excluding those that are public records as defined in section 1 (xiv) of the National Archives of South Africa Act, 1996 (Act No. 43 of 1996), or in a provincial law pertaining to records or archives; and
- any other prescribed category.

Under the National Heritage Resources Act (Act No. 25 of 1999), provisions are made that deal with, and offer protection to, all historic and prehistoric cultural remains, including graves and human remains.

2. GRAVES AND CEMETERIES

Graves younger than 60 years fall under Section 2(1) of the Removal of Graves and Dead Bodies Ordinance (Ordinance no. 7 of 1925) as well as the Human Tissues Act (Act 65 of 1983) and National Health Act (Act 61 Of 2003) and are the jurisdiction of the National Department of Health and the relevant Provincial Department of Health and must be submitted for final approval to the Office of the relevant Provincial Premier. This function is usually delegated to the Provincial MEC for Local Government and Planning or in some cases the MEC for Housing and Welfare. Authorisation for exhumation and reinterment must also be obtained from the relevant local or regional council where the grave is situated, as well as the relevant local or regional council to where the grave is being relocated. All local and regional provisions, laws and by-laws must also be adhered to. In order to handle and transport human remains, the institution conducting the relocation should be authorised under Section 24 of Act 65 of 1983 (Human Tissues Act).

Graves older than 60 years, but younger than 100 years, fall under Section 36 of Act 25 of 1999 (National Heritage Resources Act) as well as the Human Tissues Act (Act 65 of 1983) and National Health Act (Act 61 Of 2003) and are the jurisdiction of the South African Heritage Resource Agency (SAHRA). The procedure for Consultation Regarding Burial Grounds and Graves (Section 36(5) of Act 25 of 1999) is applicable to graves older than 60 years that are situated outside a formal cemetery administrated by a local authority. Graves in the category located inside a formal cemetery

administered by a local authority will also require the same authorisation as set out for graves younger than 60 years over and above SAHRA authorisation.

If the grave is not situated inside a formal cemetery but is to be relocated to one, permission from the local authority is required and all regulations, laws and by-laws set by the cemetery authority must be adhered to.

Appendix B
CURRICULUM VITAE

**PROFESSIONAL CURRICULUM
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: 17 Years

Experience Related to the Scope of Work:

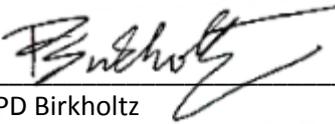
- Polke has worked as a **HERITAGE SPECIALIST / ARCHAEOLOGIST / HISTORIAN** on more than 275 projects, and acted as **PROJECT MANAGER** on almost all of these projects. His experience include the following:
 - Development of New Sedimentation and Flocculation Tanks at Rand Water's Vereeniging Pumping 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 *Centre 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 Noupoot 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*

I, Polke Doussy Birkholtz, hereby confirm that the above information contained in my CV is true and correct.



PD Birkholtz

5 January 2016
Date

