PROPOSED DEVELOPMENT OF THE LIMPOPO CENTRAL HOSPITAL ON THE REMAINING EXTENT OF ERF 6861 – EXTENSION 30 IN POLOKWANE IN THE LIMPOPO PROVINCE

Phase 1 – Heritage Impact Assessment

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Declaration of Independence

The report has been compiled by PGS Heritage (Pty) Ltd, an appointed Heritage Specialist for Nemai Consulting for the proposed Limpopo Central Hospital. 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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Document Title -	***The Proposed Development of the Limpopo Central Hospital the Remaining Extent of Erf No. 6861 – Extension 30 in Polokwane in the Limpopo Province.***		
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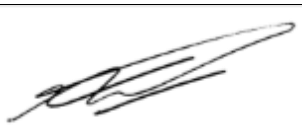
Project Sponsor	Wouter Fourie		Heritage Specialists/ Principal Investigator
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EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) was appointed by Nemai Consulting to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Report (EIA), for the proposed development of the Limpopo Central Hospital, situated on the Remaining Extent of Erf no. 6861 – Extension 30 in the Polokwane Local Municipality area, Capricorn District, Limpopo Province.

A total of seven heritage sites were identified within the proposed development area. All related to Iron Age occupation (LIM 003 to LIM 009) were identified.

These heritage sites most probably formed part of a settlement, identified by Roodt (2001), directly to the south where the Edupark Complex is situated. The archaeological sites at the Edupark Complex are dated between 1000AD and 1650AD and the earliest occupation can be linked to the Eiland phase, while the Moloko (Sotho-Tswana) and Letaba (Ndebele) Late Iron Age occupants arrived on the Pietersburg plateau in the 1600s. Roodt mentioned that the Edupark sites extended further to the north, however this was not documented in detail. Roodt also mentioned that a total of 13 burials or partial burials were rescued from the Edupark site, most of which had been disturbed due to construction activities. The excavations in the parking area also revealed seven hut floors, seven oval shaped cattle byres, as well as cultural material such as pottery sherds, ostrich eggshell beads, glass beads, a single cowry shell and various concentrations of faunal skeletal material.

Both of the proposed development layouts present possible impacts on the heritage resources identified. The identified heritage sites are rated of having High/Medium Significance as well as being Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected or moved/destroyed, thus the sites identified are considered as “no go” areas until further mitigation is implemented.

Extent of mitigation

- The extent of the Iron Age site needs to be documented through surveying of the site and the development of site layout maps;
- Identified structures must be excavated with the aim of determining age, cultural affinity and utilization areas;

- Specific attention must be given to the excavation and documentation of identified middens on the site;
- After completion of the excavation, the collected material must be analysed for reporting purposes and then curated in a recognised provincial repository;
- A destruction permit must then be applied for with the backing of the mitigation report;
- This application for destruction must be lodged with the SAHRA under section 35 of the National Heritage Resources Act 25 of 1999 (NHRA).
- Upon issuing of the destruction permit, construction can then commence.
- During the construction an archaeologist must monitor the site clearing, as the possibility of encountering subsurface cultural and human remains are deemed to be high.

Palaeontology

The SAHRIS online database was accessed and the Palaeontological Sensitivity Map was consulted.

It was found that the palaeontological sensitivity for the study area was low and/or insignificant and that no palaeontological studies are required. A protocol, however, for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are made, and that SAHRA and a palaeontologist should be alerted to determine the way forward.

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This report has been compiled taking into account the NEMA appendix 6 requirements for specialist reports as indicated in the table below.

NEMA Regs (2014) - Appendix 6	Relevant section in report
Details of the specialist who prepared the report	Page 2 of Report – Contact details and company
The expertise of that person to compile a specialist report including a curriculum vitae	Section 1.2 – refer to Appendix B
A declaration that the person is independent in a form as may be specified by the competent authority	Page 2 of the report
An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1
The date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 5
A description of the methodology adopted in preparing the report or carrying out the specialised process	Section 3
The specific identified sensitivity of the site related to the activity and its associated structures and infrastructure	Section 3.2, 4.1- 4.2
An identification of any areas to be avoided, including buffers	Section 4.1
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;	
A description of any assumptions made and any uncertainties or gaps in knowledge;	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 5
Any mitigation measures for inclusion in the EMPr	Section 6
Any conditions for inclusion in the environmental authorisation	Section 6
Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 6
A reasoned opinion as to whether the proposed activity or portions thereof should be authorised and	Section 6
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 was handled as part of the EIA and EMP process.
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.

CONTENTS **Page**

List of Appendices

List of Figures

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by Nemai Consulting to undertake a Heritage Impact Assessment (HIA) that forms part of the Environmental Impact Report (EIA) for the proposed development of the Limpopo Central Hospital, on remainder of Erf 6861 of Pietersburg Extension 30, found in the Polokwane Local Municipality area, Capricorn District, Limpopo Province.

1.1 SCOPE OF THE STUDY

The aim of the study is to identify possible heritage sites and finds that may occur in the proposed development area and as a result help determine if the proposed layout is viable. The HIA aims to inform the EIA in the development of a comprehensive EMP to assist the developer in managing the discovered heritage resources in a responsible manner, in order to protect, preserve, and develop the heritage resources within the framework provided by the National Heritage Resources Act of 1999 (Act 25 of 1999) (NHRA).

1.2 SPECIALIST QUALIFICATIONS

This HIA was compiled by PGS Heritage (PGS).

The staff at PGS has a combined experience of nearly 80 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes and will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Mr. Marko Hutten, author and field archaeologist investigator for this project, is registered with the Association of Southern African Professional Archaeologists (ASAPA) and has CRM accreditation within the said organisation. He has 18 years of experience in heritage management and holds a B.A. in Archaeology and Social Anthropology and a B.A. (Hons) in Archaeology.

Mr. Wouter Fourie, the Project Coordinator, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator; he is further an Accredited Professional Heritage Practitioner with the Association of Professional Heritage Practitioners (APHP).

Refer to **Appendix B** for CV's.

1.3 ASSUMPTIONS AND LIMITATIONS

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 development area. Various factors account for this, including the subterranean nature of some archaeological sites. 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, which also applies to graves and cemeteries. 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.

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. National Environmental Management Act (NEMA) Act 107 of 1998
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)
    c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
    d. Environmental Management Plan (EMP) – Section (34)(b)
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…”. NEMA states that an integrated EMP should, (23 -2 (b)) “…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage”. 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 AIA report is compiled.

1.5 TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes -

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 30 000-300 000 years ago, associated with early modern humans.

Palaeontology

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

Abbreviations	***Description***
AIA	Archaeological Impact Assessment

ASAPA	Association of Southern African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
ESA	Earlier Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
LSA	Later Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
MIA	Middle Iron Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PHRA	Provincial Heritage Resources Authority
ROD	Record of Decision
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency

Refer to **Appendix A** for further discussions on heritage management and legislative frameworks.

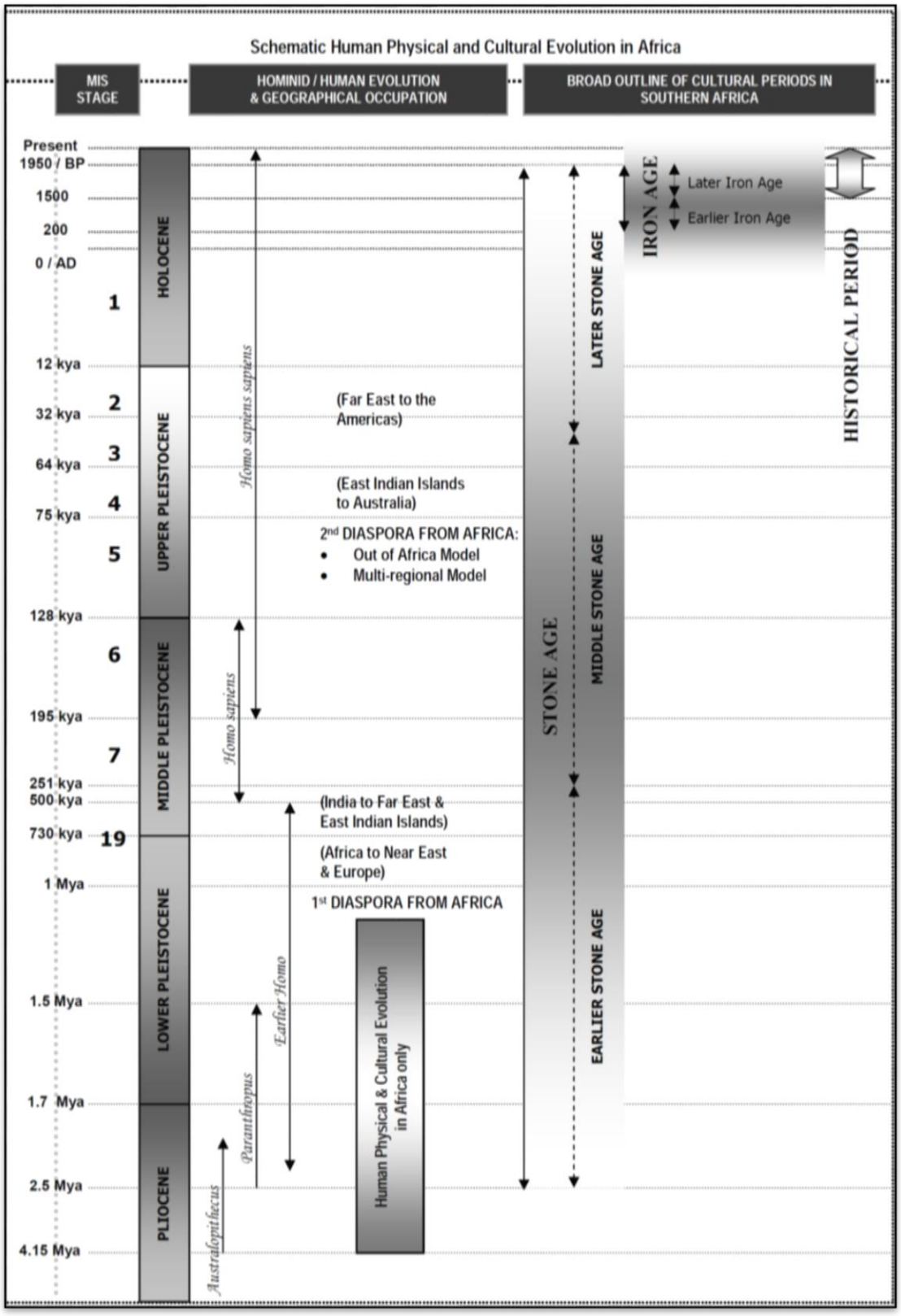

Figure 1*: Human and Cultural timeline in Africa (Morris, 2008).*

2 TECHNICAL DETAILS OF THE PROJECT

2.1 PROJECT DESCRIPTION

The proposed Limpopo Central Hospital is currently situated between Edupark, the Northern Academy Secondary School and the N1 road. The proposed site is approximately 21 ha in extent and is situated on the remainder of Erf 6861 of Pietersburg Extension 30. The proposed site borders the north east of the N1 bypass, situated east of the Peter Mokaba Soccer Stadium. Access to the hospital site will be obtained from Webster Street where traffic circles will be introduced to regulate traffic congestion to the site.

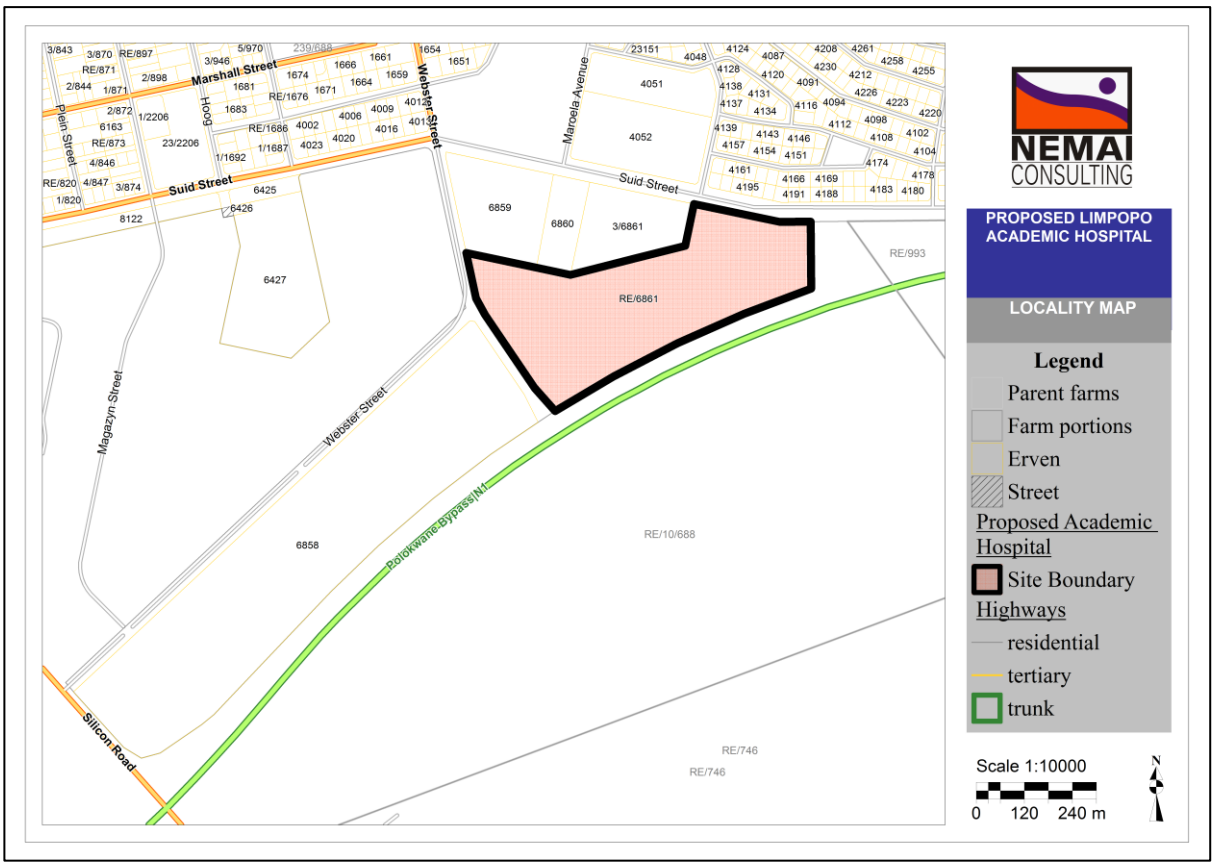

Figure 2: Locality Plan (Nemai Consulting, 2016).

The building of a new 488 bed central hospital, Limpopo Central Hospital, on a new site in Polokwane that will provide the tertiary care for the province and which will be the major teaching hospital for the University of Limpopo Faculty of Health Sciences and School of Medicine.

There will be provision of the following at the new facility:

- 488 beds clinical care capacity for a wide range of highly specialised care;
- Mostly arranged in 28 bed wards (comprising some single-bed, double-bed, four bed and six bed units);
- Specific intensive care units (ICU) and high care (HC) layouts;
- Maternal and child health (MCH) (Paediatrics and Obstetrics & Gynaecology) will be consolidated on the site separate to the adult component but sharing clinical and hospital support services;
- A mother's lodge (capacity of 24);
- A pregnant mothers lodge (capacity of 18);
- Transit – waiting (capacity of 12); and
- A day procedure beds (capacity of 12)

There will be support for a complete tertiary clinical care and academic complex core teaching capacity, compromising of a 488 x L3 beds at Limpopo Central Hospital delivering Provincial Tertiary Services (T1) and Central Referral Services (T2) care in most major clinical disciplines.

2.2 SITE DESCRIPTION

The proposed development is located on remainder of Erf 6861 of Pietersburg Extension 30 of Pietersburg. The proposed site borders the north east of the N1 bypass (*Figure 3*), situated to the east of the Peter Mokaba Soccer Stadium. The Edupark Complex is situated adjacent and on the south-western side of the proposed area. The Northern Academy Secondary School (*Figure 4*) borders the northern extent of the study area. The extent of the site is approximately 21 hectares (Ha). Access to the hospital site will be from Webster Street (*Figure 5*) where traffic circles will be introduced to regulate traffic congestion to the site.

The proposed site is relatively flat and slopes very gently from north to the south. It is covered with typical bushveld vegetation (*Figure 6*) and has red sandy soils. The southern section of the proposed site is largely undisturbed, but the northern section of the site is mostly covered with numerous mounds of dumped soil, rock and building rubble (*Figure 7* & *Figure 8*). The proposed site is Municipality Grounds and was most probably used as grazing facilities before any development occurred in the area.

Figure 3: View of the N1 eastern bypass under construction.

Figure 4: View of the Northern Academy Secondary School adjacent to the study area.

Figure 5: View of Webber Street on the north western side of the study area.

Figure 6: General view of the vegetation within the proposed study area.

Figure 7: View of the dumping within the northern section of the study area.

Figure 8: Another view of the dumping within the northern section of the study area.

3 ASSESSMENT METHODOLOGY

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

3.1 METHODOLOGY FOR ASSESSING HERITAGE SITE SIGNIFICANCE

The applicable maps, tables and figures are included, as stipulated in NHRA and NEMA. The HIA process consists of three steps:

Step I – Literature Review - The background information to the field survey relies greatly on the Heritage Background Research.

Step II – Physical Survey - A physical survey was conducted predominantly by vehicle along the proposed Newlands pipeline proposed area by a qualified archaeologist, which aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

Step III – The final step involved the recording and documentation of relevant archaeological resources, the assessment of resources in terms of the HIA criteria and report writing, as well as mapping and constructive recommendations.

The significance of the identified heritage sites are 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 –
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 1: 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 Significance	Conservation; Mitigation not advised
Local Significance (LS)	Grade 3B	High Significance	Mitigation (Part of site should be retained)
Generally Protected A (GP.A)		High / Medium Significance	Mitigation before destruction
Generally Protected B (GP.B)		Medium Significance	Recording before destruction
Generally Protected C (GP.A)		Low Significance	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 **Table 2**.

Table 2: Impact Assessment Criteria

CRITERIA	CATEGORIES	EXPLANATION
Overall nature	**Negative**	Negative impact on affected biophysical or human environment.
	Positive	Benefit to the affected biophysical or human environment.
Type	**Direct**	Are caused by the action and occur at the same time and place.
	Indirect or Secondary	Are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. May include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.
	Cumulative	Is the impact on the environment, which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Spatial Extent over which impact may be experienced	**Site**	Immediate area of activity incorporating a 50m zone which extends from the edge of the affected area.
	Local	Area up to and/or within 10km of the 'Site' as defined above.
	Regional	Entire community, drainage basin, landscape etc.
	National	South Africa.
Duration of impact	**Short-term**	Impact would last for the duration of activities such as land clearing, land preparation, fertilising, weeding, pruning and thinning. Quickly reversible.
	Medium-term	Impact would after the project activity such as harvesting. Reversible over time.
	Long-term	Impact would continue beyond harvesting/ extraction of the trees.
	Permanent	Impact would continue beyond decommissioning.
Severity	**Low, Medium, High Negative**	Based on separately described categories examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning or slightly alters the environment itself.
	Low, Medium, High Positive	

CRITERIA	CATEGORIES	EXPLANATION
Reversibility	**Completely Reversible**	The impact can be completely reversed with the implementation of correct mitigation and rehabilitation measures.
	Partly Reversible	The impact can be partly reversed providing mitigation measures are implemented and rehabilitation measures are undertaken
	Irreversible	The impact cannot be reversed, regardless of the mitigation or rehabilitation measures.
Irreplaceable Loss	**Resource will not be lost**	The resource will not be lost or destroyed provided mitigation and rehabilitation measures are implemented.
	Resource may be partly destroyed	Partial loss or destruction of the resource will occur even though all management and mitigation measures are implemented.
	Resource cannot be replaced	The resource cannot be replaced no matter which management or mitigation measures are implemented.
Probability of occurrence	**Unlikely**	<40% probability.
	Possible	40% probability.
	Probable	>70% probability.
	Definite	>90% probability.
Mitigation Potential **[i.e. the ability to manage or mitigate an impact given the necessary resources and feasibility of application.]**	**High or Completely Mitigatible**	Relatively easy and cheap to manage. Specialist expertise or equipment is generally not required. The nature of the impact is understood and may be mitigated through the implementation of a management plan or through 'good housekeeping'. Regular monitoring needs to be undertaken to ensure that any negative consequences remain within acceptable limits. The significance of the impact after mitigation is likely to be low or negligible.
	Moderate or Partially Mitigatible	Management of this impact requires a higher level of expertise and resources to maintain impacts within acceptable levels. Such mitigation can be tied up in the design of the Project. The significance of the impacts after mitigation is likely to be low to moderate. May not be possible to mitigate the impact entirely, with a residual impact(s) resulting.
	Low or Unmitigatible	Will not be possible to mitigate this impact entirely regardless of the expertise and resources applied.

CRITERIA	CATEGORIES	EXPLANATION
Impact Significance		The potential to manage the impact may be beyond the scope of the Project. Management of this impact is not likely to result in a measurable change in the level of significance.
	Negligible	-
	Low	Largely of HIGH mitigation potential, after considering the other criteria.
	Moderate	Largely of MODERATE or partial mitigation potential after considering the other criteria.
	Substantial	Largely of LOW mitigation potential after considering the other criteria.

4 ARCHIVAL AND DESKTOP RESEARCH FINDINGS

4.1 ARCHIVAL FINDINGS

The aim of the archival background research is to identify possible heritage resources that could be encountered during fieldwork, as summarised in **Table 3**.

Table 3: Summary of History of the study area

DATE	DESCRIPTION
2.5 million to 250 000 years ago	The Earlier Stone Age is the first and oldest phase identified in South Africa's archaeological history and comprises of two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is known as the Acheulian and comprises of more refined and better made stone artefacts, such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago. Excavations at several well-known sites in the region attest to ESA occupation. Makapansgat, 80 kilometres to the south-west, provided evidence of long occupation initially by Australopithecus africanus, from approximately 3.3 million years B.P. (Bergh 1999), while the Cave of Hearths produced stone tools and associated debris from a date of 400,000 B.P. The Olieboompoort shelter also indicates the presence of ESA people from between 1 million to 400 000 years B.P. (Birkholtz & Steyn 2002).
250 000 to 40 000 years ago	The Middle Stone Age is the second oldest phase identified in South Africa's archaeological history. This phase is associated with flakes, points and blades manufactured by means of the so-called 'prepared core' technique.

DATE	DESCRIPTION
	Also at Makapansgat, the upper strata are characterised by Middle Stone Age assemblages of 110,000 to 50,000 B.P. The site is one of the few to exhibit Acheulean assemblages in Southern Africa and contains overlying Middle Stone Age Howiessonspoort industry tools, with early evidence of fire use (Bergh, 1999; Mitchell, 2002).
40 000 years ago to the historic past	The Later Stone Age is the third archaeological phase identified and is associated with an abundance of very small artefacts known as microliths. Makapansgat's long occupation includes Late Stone Age assemblages dating from 10,000 to 5,000 years B.P., which is characterised by the Smithfield B industry (Bergh, 1999; Mitchell, 2002).
Rock Art	In Southern Africa, the Late Stone Age is characterised by the appearance of rock art in the form of paintings and engravings, and the LSA is represented in the Wolkberg by the presence of San rock paintings and engravings in the Mohlapitse River valley to the west of the study area (Changuion 2008). Further away and to the west, the Waterberg is known for its many rock art sites, including those containing shaded paintings such as at Haakdoorndraai (Pager, 1973) and the depiction of a fat tailed sheep at Dwaalhoek 185 KQ (van der Ryst 1998). To the north-west, the Makgabeng plateau has over 460 recorded rock art sites (Eastwood et. al., 2002). Evidence from Late Stone Age tool sites also attests to the long occupation of the wider area by hunter-gatherers. Very few rock art sites are known in the Pietersburg region, however Daskop is the only site that has been recorded to date (Eastwood 1999). Another site to the north-west of Pietersburg and south-west of the Makgabeng plateau, was reported by Walter Battiss in 1947. The Battiss 'Battle Site' is situated some 60 km south-west of the Makgabeng plateau, near the Makgalakwena River found north of Pietersburg (Eastwood 1999).
400-1000AD	The Early Iron Age includes the majority of the first millennium A.D. and is characterised by traditions such as "Happy Rest" and "Silver Leaves". A number of Early Iron Age sites are known from the wider area representative of two distinct pottery assemblages. The oldest assemblage belongs to the Mzonjani facies of the Urewe tradition and dates to between 450 and 750 A.D. The Kulundu tradition is represented in the wider area, by the Doornkop and Diamant facies, which dates to between 750 and 1000 A.D (Huffman, 2007).
1000-1300AD	The Middle Iron Age spans the 10th to the 13th Centuries A.D. and includes well known cultures, such as those present at K2 and Mapungubwe. The Middle Iron Age is represented in the area by the Eiland facies of the Kulundu tradition, dating from between 1000 and 1300 A.D (Huffman, 2007).

DATE	DESCRIPTION
1400-1800AD	The Late Iron Age is taken to stretch from the 14th Century up to the colonial period and includes traditions such as Icon and Letaba. Reconnaissance in the Molepo tribal area south-east of Pietersburg revealed a large number of smelting sites (13). One of these was selected for excavation, while the others were only visually inspected and this excavated site was dated to AD 1530 + 50 (Pta-418) (Van Schalkwyk 1987). Around the town of Mokopane to the south-west of the study area, several Late Iron Age sites are characteristic of the continuing Kalundu tradition, belonging either to the Icon facies (1300 to1500 A.D.) or the Madikwe facies (1500 to 1700 A.D.) (Huffman, 2007).
Early 1600s	Successive waves of both homogenous and heterogeneous groups entered and occupied the area since 1600 A.D., including the Ndebele, Shangaan and Koni people (Loubser, 1994). During the 17th Century Iron Age Nguni farmers moved from the Hlubi tribe in present day Kwa-Zulu Natal and settled in the former Transvaal as the Transvaal Ndebele. They were split into two major groupings of which the Northern Ndebele settled in the Mokopane - Polokwane region. While it is not clear which groups they settled alongside or displaced, several accounts of contact with the Northern-Sotho and Ba-Pedi are reported in the ethnology of these peoples. 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 (Mokopane) on the farm Pruissen.
c.1600-1900AD	The people currently living in the wider vicinity of the study site are mostly Bakoni of Matlala and Molepo, both of Northern Sotho origin, with the Mamabolo and Balobedu groups historically settled further to the east (Changuion 2008). The Bakoni of Matlala first settled in the area around modern day Polokwane around 1730 A.D. (Krige, 1937) before moving north and west towards Makgabeng and founding a settlement at Ga Matlala a' Thaba. The Koni are not a homogenous group and most of the Koni people regard their ancestry as being Nguni and originating in Swaziland (Mönnig, 1967). Excavations in 1980 by the University of the Witwaterstrand at the site of the Bokoni Malapa museum south of Polokwane indicated settlement from 1600 to 1900 A.D. comprising a sequence of Northern Ndebele, Northern Sotho and Shangaan people, finally being occupied by the Koni of Matlala (Jordaan, 1992). Loubser (1994) also excavated the site of Bambo Hill and six other Late Iron Age sites located to the north-east and south-east of Pietersburg.
Early 1800s	The beginning of the Historical Period overlaps the demise of the late Stone and Iron Ages and is characterised by the first written accounts of the region from 1600 A.D. A number of early European travellers visited the area from the early 19th Century onwards including Cowan & Donovan in 1808, David Hume in 1825, Cornwallis Harris

DATE	DESCRIPTION
	in 1836, Livingstone in 1847 and Carl Mauch in 1869 (Burke 1969; Birkholtz & Steyn 2002).
1852	British grant Transvaal Boers independence in terms of the Sand River Convention. Formation of the Zuid-Afrikaanse Republiek (http://www.sahistory.org.za/topic/polokwanepietersburg-timeline)
1860s	Many of the first white settlers in the area arrived in the 1860s as wood cutters attracted by the extensive indigenous forests on the escarpment to the west where saw-pits from these days can still be seen (Changuion 2008).
1870	Considerable tensions arose between the settlers and the local people and there were a number of skirmishes including the famous siege of the Ndebele ruler Mokopane in the Makapans caves and the forced abandonment of Potgietersrust in 1870. This site is located quite a distance from the study area (Wiener 2006).
1871	Gold was found in the Transvaal in 1871 on Franz du Preez's farm 'Eersteling' near Marabastad. This led to the first gold rush in the Transvaal (Wiener 2006).
1877	Annexation of the Transvaal by the British. Rise of nationalist political fervour among the Dutch population (http://www.sahistory.org.za/topic/polokwanepietersburg-timeline)
1880-81	The First Anglo-Boer War (1880-1881) broke out between the Transvaal and Britain, following the annexation of the Transvaal by the British in 1877. After a series of decisive victories by the Boers, the British gave back a large measure of self-rule to the Transvaal. The Boers' victory over the British was celebrated on 16 December 1881 in the Zoutpansberg district. (Wiener 2006; http://www.sahistory.org.za/topic/polokwanepietersburg-timeline).
1882-1883	Executive Council authorises the purchase of the farm Sterkloop. On 8 October 1883, Kommandant-Generaal Pieter Jacobus Joubert, the head of the South African Republic's defence force and Vice-President of the Transvaal Republic under President Paul Kruger, visited the Zoutpansberg district to decide where its capital should be established. Several meetings were held to discuss the various options for the new town. At the first meeting at Fort Klipdam [Rhenosterpoort], 72 men proposed that Sterkloop should be the site chosen. Joubert decided to establish the new town on Opzadel [Sterkloop], then owned by B J Vorster and Gert Emmenis. The Volksraad authorised Piet Joubert to investigate and finalise the siting of a new town north of Pretoria. The town was called Pietersburg, after Kommandant-Generaal Pieter Jacobus Joubert. (Wiener 2006; http://www.sahistory.org.za/topic/polokwanepietersburg-timeline)
1884-1886	On 29 January 1884, the Government bought the farm and the land-surveyor G R von Wielligh laid out 150 plots. Of these, 94 plots were given free of charge to people who

DATE	DESCRIPTION
	had owned property in Schoemansdal and the rest were sold to the public for £6 each. On 26 July 1886, the magistrate's office was moved from Marabastad to Pietersburg and on 31 July 1886, Pietersburg was officially established. (Wiener 2006; http://www.sahistory.org.za/topic/polokwanepietersburg-timeline).
1887	The town of Haenerstburg, 40 kilometres to the east of the study area, was established in 1887 after gold was found there. Old mine shafts and remains of buildings can still be seen in this area (Changuion 2008).
1888-1893	In 1888 the railway was completed from Pretoria to Pietersburg, opening up the North even further. The population of Pietersburg grew quickly from 200 whites in 1889, to 800 in 1893
1895	The history of the area also includes the 1895 war between Chief Makgoba and the ZAR. Relations between the whites and the Bavenda tribe under Magato deteriorated drastically because of disagreements over grazing and hunting grounds. The Zuid-Afrikaner Administration did not have sufficient funds to protect the whites. As a result, on 15 July 1867, the defenders of Schoemansdal under Commandant-General Paul Kruger, were forced to abandon the village, which was then burned by the Bavenda (Wiener 2006).
1889	In 1889 the famous postal coach service from Pietersburg via Haenertsburg to the Lowveld establishment of the by Doel Zeederberg (Changuion 2008).
1899-1902	The South African War (also known as the Anglo Boer War) was fought between Great Britain and the Boer republics of the Zuid-Afrikaansche Republiek and Orange Free State. In 1900 there was an historic gathering of the Transvaal and Orange Free State republics where Pietersburg was nominated as the temporary seat of Government of the United Boer Republics (http://www.sahistory.org.za/topic/polokwanepietersburg-timeline). In the Soutpansberg-Pietersburg area several incidents included a clash between the Bushveldt Carbineers and the Boers at W.H. Viljoen's farm Duiwelskloof in August 1901 (Woolmoore 2002), including the destruction of the last Long Tom guns near Haenertsburg in April 1901 (Changuion 2008). Bush Veldt Carbineers and Pietersburg Light Horse The Bush Veldt Carbineers were an irregular unit of the British forces raised in Pretoria in February 1901 and did useful work in the difficult country north of Pietersburg in that year. However, the unit gained an unfortunate notoriety by the conviction of officers Harry "Breaker" Morant, Handcock and Witton, on charges that they had committed acts not in accordance with the rules of civilised warfare. Harry 'Breaker' Morant was a drover

DATE	DESCRIPTION
	and horse-breaker and thus acquired the name 'Breaker'. He enlisted with the South Australian Mounted Rifles to fight in the Boer War. He and two other soldiers, Handcock and Witton were court-martialled and all three found guilty of executing several Boer prisoners and a German missionary. Handcock and Morant were executed by the firing squad on 27th February 1902. Kitchener commuted Witton's sentence to a lifetime of penal servitude. The Bush Veldt Carbineers were renamed to the Pietersburg Light Horse on 1 December 1901. (http://www.angloboerwar.com/unit-information/south-african-units/305-bush-veldt-carbineers-and-pietersburg-light-horse). April 1-15. The most important movement was the progress of a British force, under the command of Colonel Plumer, in an advance north from Pretoria, by the Pietersburg line, towards Nylstroom. No effective resistance was offered by opposing Boer forces, and the towns and districts in that region were occupied by the enemy with very little opposition. Pietersburg had been the seat of Transvaal Government for several months, and the purpose of the Plumer column was to attack the place. This was successfully done; General Schalk Burger and the acting members of the Transvaal Executive retiring from the town further east into the Zoutpansberg regions, where they were not pursued. (Conan Doyle 1902; http://www.angloboerwar.com/books/37-davitt-boer-fight-for-freedom/867-davitt-chapter-xxxvii-diary-of-the-warjanuary-to-june-1901) The war ended on 31 May 1902 with the British as the victors. The effects of the war were felt for years after the hostilities had actually ended.
Early 1900s	A notable pioneer in the area was Orlando Baragwanath who together with his partner Frank Lewis had discovered Zambia's copper belt. In the early 1900's Baragwanath and Lewis settled at The Downs in the mountains to the south west of the study area and constructed a now famous road over the mountain, the Ollie Baragwanath Pass (Changuion 2008).
1904	First Municipal election held. Pietersburg's population made up of 3,276 people of whom 1,620 were White http://www.sahistory.org.za/topic/polokwanepietersburg-timeline)
1925	Formation of Zion Christian Church (ZCC). The headquarters of the ZCC at Moria 40 kilometres to the west of the study area sees millions of worshippers congregate there every Easter in a major cultural event.
1984	In 1984 the then Pietersburg Town Council completed the construction of the Bakoni Malapa Northern Sotho Open Air Museum south of the town, having consulted and utilised the traditional knowledge and labour of the Matlala tribe (Jordaan, 1992).
2002	In February 2002, the city of Pietersburg became one of the first places in South Africa to change its name after the fall of apartheid, and was renamed to Polokwane, the Northern Sotho word which means "Place of Safety". (http://www.polokwane.gov.za/)

4.2 PALAEONTOLOGY

The SAHRIS database was used in order to observe the Palaeontology of the study area (http://www.sahra.org.za/sahris). As can be seen in **Figure 9** and **Figure 10**, the study area is underlain by insignificant palaeontology with a small section in the north-western corner that is rated as low significance. No further palaeontological studies are required however a protocol for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are discovered, and that SAHRA and a palaeontologist should be alerted to determine the way forward.

Figure 9: Palaeontological assessment of the study area (sahris, 2016).

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 10: Key of palaeontological map (sahris, 2016).

5 FIELD WORK FINDINGS

Due to the nature of cultural remains, with the majority of artefacts occurring below the surface, a controlled-exclusive surface survey was conducted over a period of 1 day, on foot, by an archaeologist and field assistant from PGS. The fieldwork was conducted on the 30th of August 2016.

The track logs (in blue) for the survey are indicated on the map below (Figure 11).

Figure 11: Map indicating track logs of the HIA conducted.

5.1 HERITAGE FINDINGS

The fieldwork team from PGS Heritage, traversed the study area on foot. The team conducted a controlled-exclusive surface survey, specifically focussing on undisturbed areas or areas not affected by dumping. GPS coordinates were taken of the identified heritage sites and such sites were recorded photographically. The track logs recorded during the fieldwork by the team from PGS Heritage, are depicted below. The field work was conducted on 30 August 2016 and most of the day was spent on the survey, performed by M. Hutten and T. Mulaudzi.

A total of nine heritage sites were identified within and just outside the proposed development area. Seven related Iron Age sites (LIM 003 to LIM 009).

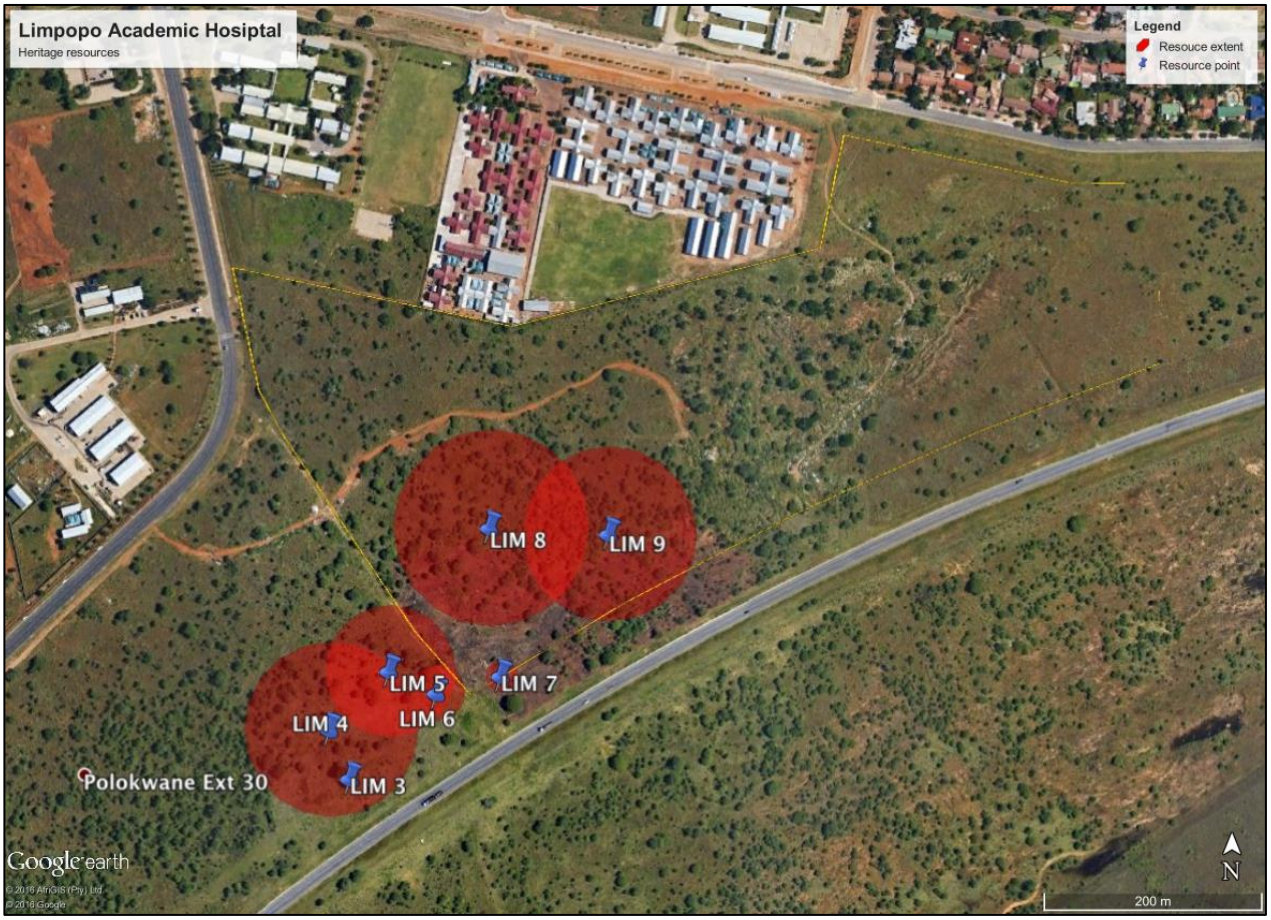

Figure 12: Heritage resources in relation to the study area.

5.2 FIELDWORK FINDINGS

5.2.1 LIM 003:

GPS Coordinates:

S 23^0 55’ 22.7” E 29^0 28’ 39.5”

Site Description:

Another stone walled enclosure was identified at this location. The enclosure measures approximately 6m in diameter and is situated within a cluster of trees (*Figure 13*). It consists of a low, double line of packed rocks which is damaged to some extent in some areas (*Figure 14*). The stone wall is also overgrown with grass and other vegetation making the identification of the size, shape and purpose of the stone wall difficult.

Figure 13: View of the stone walled enclosure identified at site LIM 003.

Figure 14: Close up view of the packed stone wall at site LIM 003.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is currently situated (see 5.2.1. LIM 001).

The identified site LIM 003 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before the site may be affected, moved or destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.2 LIM 004:

GPS Coordinates:

S 23^0 55' 21.3" E 29^0 28' 38.8"

Site Description:

Another stone walled complex was identified at this location. It consists of several enclosures and sections of low, packed stone walls (*Figure 15*). The walls are disturbed in several places, but they form part of a larger, extensive settlement that extends further to the south and to the north (*Figure 16*). This identified section of stone walled enclosures measures approximately 80m in diameter and the walls consist of low, double or single line packed rocks, which are damaged to some extent in some areas (*Figure 17*). The stone walls are also overgrown with grass and other vegetation. This makes the identification of the size, shape and purpose of the stone walls difficult. Several potsherds were also identified within the stone walled enclosures (*Figure 18*).

Figure 15: View of the stone walled complex identified at site LIM 004.

Figure 16: Another view of the identified stone walled complex at site LIM 004.

Figure 17: View of the remains of the stone walls at site LIM 004.

Figure 18: View of some of the potsherds identified at site LIM 004.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 004 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before the site may be affected, moved or destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.3 LIM 005:

GPS Coordinates:

S 23^0 55' 19.5" E 29^0 28' 40.8"

Site Description:

Another stone walled complex was identified at this location. This complex is similar to the one identified at site LIM 004. It also consists of several enclosures and sections of low, packed stone walls (*Figure 19*). The walls are also disturbed in several places, but they form part of a larger, extensive settlement which extents further to the south and to the north (*Figure 20*). This identified section of stone walled enclosures measures approximately 60m in diameter and consists of low, double or single line packed rocks, which are damaged to some extent in some areas (*Figure 21*). The stone walls are also overgrown with grass and other vegetation

making the identification of the size, shape and purpose of the stone walls difficult. Several potsherds were also identified from within the stone walled enclosures (*Figure 22*).

Figure 19: General view of the stone walled complex identified at site LIM 005.

Figure 20: View of some of the low stone walls identified at site LIM 005.

Figure 21: Another view of some of the identified stone walls at site LIM 005.

Figure 22: View of some of the potsherds identified at site LIM 005.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 005 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required for the site before it is affected, moved or destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.4 LIM 006:

GPS Coordinates:

S 23^0 55' 20.2" E 29^0 28' 42.3"

Site Description:

A large ash midden was identified at this location (*Figure 23*). It consists of a mound of ash mixed with soil (*Figure 24*) and it contains numerous potsherds, discarded animal bones and other archaeological material (*Figure 25*). The mound measures approximately 25m and is in close proximity of the stone walled complexes and enclosures identified at sites LIM 003, LIM 004 and LIM 005. The people who resided at the identified stone walled complexes, most probably used this area to dump their domestic rubbish.

Figure 23: View of the identified midden at site LIM 006.

Figure 24: View of the mixed ash and soil of the midden identified at site LIM 006.

Figure 25: View of some of the potsherds identified at site LIM 006.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 004 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before the site may be affected, moved or destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.5 LIM 007:

GPS Coordinates:

S 23^0 55' 19.7" E 29^0 28' 44.4"

Site Description:

Another large ash midden was identified at this location (*Figure 26*). It also consists of a mound of ash mixed with soil (*Figure 27*) and it also contains numerous potsherds, discarded animal bones and other archaeological material (*Figure 28*). The mound measures approximately 15m, but a part of this site has been damaged during earth moving activities for the construction of the N1 by-pass right next to it (Figure 29). The full extent of this site could not be determined.

This site is in close proximity of the stone walled complexes and enclosures identified at sites LIM 008 and LIM 009. The people who resided at the identified stone walled complexes most probably used this area to dump their domestic rubbish.

Figure 26: General view of the identified ash midden at site LIM 007.

Figure 27: Close up view of the ash midden and artefacts identified at site LIM 007.

Figure 28: View of some of the potsherds identified at site LIM 007.

Figure 29: View of the earth moving activities from the adjacent N1 bypass development.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 004 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before the may be affected or moved/destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.6 LIM 008:

GPS Coordinates:

S 23^0 55' 15.3" E 29^0 28' 44.0"

Site Description:

Another stone walled complex was identified at this location. This complex is similar to the one identified at site LIM 004. It also consists of several enclosures and sections of low, packed stone walls (*Figure 30*). The walls are also disturbed in several places, but they form part of a larger, extensive settlement which extents further to the south and to the north (Figure 31). This identified section of stone walled enclosures, extend from site LIM 007 and measure approximately 90m in diameter. The walls consist of low, double or single line packed rocks, which are damaged to some extent in some areas (*Figure 32*). The stone walls are also overgrown with grass and other vegetation which makes the identification of the size, shape and purpose of the stone walls difficult. Several potsherds were also identified from within the stone walled enclosures.

Figure 30: General view of the stone walled enclosures identified at site LIM 008.

Figure 31: Close up view of some of the stone walls identified at site LIM 008.

Figure 32: Another view of the stone walls identified at site LIM 008.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 005 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before the site may be affected, moved or destroyed.

Please refer Section 7 for the required mitigation measures.

5.2.7 LIM 009:

GPS Coordinates:

S 23^0 55' 15.5" E 29^0 28' 47.9"

Site Description:

Another stone walled complex was identified at this location (*Figure 33*). This complex is similar to the one identified at site LIM 004. It also consists of several enclosures and sections of low, packed stone walls (*Figure 34*). The walls are also disturbed in several places (*Figure 35*), but they form part of a larger, extensive settlement which extents further to the south and to the north. This identified section of stone walled enclosures measures approximately 80m in diameter. The walls consist of low, double or single line packed rocks which are damaged

to some extent in some areas (figure 41). The stone walls are also overgrown with grass and other vegetation which makes the identification of the size, shape and purpose of the stone walls difficult. Several potsherds were identified within the stone walled enclosures.

Figure 33: General view of the location of the identified stone walls at site LIM 009.

Figure 34: View of some of the stone walls identified at site LIM 009.

Figure 35: Another view of some of the stone walls identified at site LIM 009.

Figure 36: Another view of some of the stone walls identified at site LIM 009.

Site Significance:

The identified site most probably formed a part of a settlement that was identified by Roodt (2001) directly to the south where the Edupark Complex is situated (see 5.2.1. LIM 001).

The identified site LIM 005 is deemed to be of **High/Medium Significance** and is rated as **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before they may be affected or moved/destroyed.

Please refer Section 7 for the required mitigation measures.

5.3 PALAEONTOLOGY

It was found that the palaeontological sensitivity for the study area was low and/or insignificant and that no palaeontological studies are required. A protocol, however, for incidental palaeontological finds is required. (see **Figure 9**)

6 OVERALL IMPACT EVALUATION

The study has identified that the proposed project activities will have a sustentative pre-mitigation impact on the identified heritage resources in the project area, however all the envisaged impacts on heritage resources, can be mitigated. The study has identified that the proposed project activities will have a high to medium impact on heritage resources.

6.1 STATUS QUO AND "NO GO" OPTION

6.1.1 Status Quo

A total of seven heritage sites were identified within and on the edge of the proposed development area.

The proposed development present possible impacts on some of the heritage resources identified. The identified heritage sites are rated of having High/Medium Significance, as well as being Generally Protected A (GP.A).

6.1.1.1 "No go" Option

During the heritage study, 7 heritage resources were located. The identified sites most probably formed part of a settlement that which was identified by Roodt (2001), directly to the south where the Edupark Complex is situated today. The archaeological sites at the Edupark Complex are dated between 1000AD and 1650AD and the earliest occupation can be linked to the Eiland phase, while the Moloko (Sotho-Tswana) and Letaba (Ndebele) Late Iron Age occupants arrived on the Pietersburg plateau in the 1600s. Roodt mentioned that the Edupark sites extended further to the north, although it was not documented in detail. Roodt also mentioned that a total of 13 burials or partial burials, were rescued from the Edupark site, most of which had been disturbed as a result of the construction activities. The excavations in the parking area also revealed seven hut floors, seven oval shaped cattle byres, as well as cultural

material such as pottery sherds, ostrich eggshell beads, glass beads, a single cowry shell and various concentrations of faunal skeletal material.

The sites are rated of having **High/Medium Significance** as well as being **Generally Protected A (GP.A)**. Mitigation measures and permits are therefore required before they may be affected or moved/destroyed, thus the sites identified are considered “no go” areas until further mitigation is implemented.

6.2 PROJECT IMPACT (UNMITIGATED)

During the construction, impacts may occur to Heritage and Palaeontological resources as identified for the project. These impacts will occur as a result of construction activities such as topsoil stripping, excavations and vegetation clearing.

The combined weighted project impact to the Heritage resources (prior to mitigation) will possibly be of a moderate to high negative significance. The impact will be permanent and is in all likelihood going to happen. The impact risk class is thus **moderate to high**.

However, the implementation of the recommended mitigation measures will minimise the impacts and reduce the overall impacts to **moderate to low**.

The combined weighted project impact to the Palaeontological resources (prior to mitigation) will be of a low negative significance. The impact will be insignificant.

6.3 CUMULATIVE IMPACT

The baseline impacts are considered to be moderate for Heritage resources, and additional project impacts (if no mitigation measures are implemented) will increase the significance of the existing baseline impacts., where the cumulative unmitigated impact will probably be of a moderate to high significance. The impact is going to happen and will be of short term in nature, therefore the impact risk class will be Moderate to High. However, with the implementation of the recommended management and mitigation measures this risk class can be minimized to a Low rating.

7 SUMMARY IMPACT ASSESSMENT TABLE

POTENTIAL IMPACTS (in order of impact as described in Impact Matrix)	ASPECT (refer to Impact Matrix)	Nature	Type	Extent	Duration	Severity	Reversibility	Irreplaceable Loss	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
											Without Mitigation	With Mitigation	
CONSTRUCTION PHASE													
Impacts on palaeontological resources	Heritage Resources	**Negative**	Direct	Site	Permanent	**Low**	Irreversible	Resource cannot be replaced	unlikely	High	**Low**	**Low**	Refer to Section 9
Impact on archaeological sites	Heritage resource	**Negative**	Direct	Local	Permanent	**High negative**	Irreversible	Resource cannot be replaced	Definite	Moderate or Partially Mitigatible	**High**	**Moderate to Low**	Documentation of the archaeological sites through excavations after which a destruction permit must be applied for.

8 CONCLUSIONS AND RECOMMENDATIONS

PGS was appointed by Nemai Consulting, to undertake a HIA that forms part of the EIA (EIA), for the proposed development of the Limpopo Central Hospital on the Remaining Extent of Erf no. 6861 – Extension 30 in the Polokwane Local Municipality area, Capricorn District, Limpopo Province.

A total of seven heritage sites were identified within the proposed development area. All related to Iron Age occupation (**LIM 003** to **LIM 009**) were identified.

The identified sites most probably formed part of a settlement, which was identified by Roodt (2001), directly to the south where the Edupark Complex is situated. The archaeological sites at the Edupark Complex were dated between 1000AD and 1650AD, and the earliest occupation can be linked to the Eiland phase. While the Moloko (Sotho-Tswana) and Letaba (Ndebele) Late Iron Age occupants arrived on the Pietersburg plateau in the 1600s. Roodt mentioned that the Edupark sites extended further to the north, although this was not documented in detail. Roodt also mentioned that a total of 13 burials or partial burials were rescued from the Edupark site, most of which had been disturbed as a result of the construction activities. The excavations in the parking area also revealed seven hut floors, seven oval shaped cattle byres, as well as cultural material such as pottery sherds, ostrich eggshell beads, glass beads, a single cowry shell and various concentrations of faunal skeletal material.

Both of the proposed development layouts present possible impacts on some of the heritage resources identified. The identified heritage sites are rated of having High/Medium Significance as well as being Generally Protected A (GP.A). Mitigation measures and permits are therefore required before they may be affected, moved or destroyed, thus the sites identified are considered as “no go” areas until further mitigation is implemented.

Extent of mitigation

- The extent of the Iron Age site needs to be documented through surveying of the site and the development of site layout maps;
- Identified structures must be excavated with the aim of determining age, cultural affinity and utilization areas;
- Specific attention must be give to the excavation and documentation of identified middens on the site;
- After completion of the excavation, the collected material must be analysed for reporting purposes and then curated in a recognised provincial repository;

- A destruction permit must then be applied for with the backing of the mitigation report;
- This application for destruction must be lodged with the SAHRA under section 35 of the NHRA.
- Upon issuing of the destruction permit construction can commence.
- During the construction an archaeologist must monitor the site clearing as the possibility of encountering subsurface cultural and human remains are deemed to be high.

Palaeontology

The SAHRIS online database (http://www.sahra.org.za/sahris) was accessed and the Palaeontological Sensitivity Map was also consulted.

It was found that the palaeontological sensitivity for the study area was low and/or insignificant and that no palaeontological studies are required. A protocol, however, for incidental palaeontological finds is required. This protocol should include the termination of all development work if any palaeontological finds are discovered on site, and SAHRA and a palaeontologist should be alerted to determine the way forward.

9 PREPARERS

Marko Hutten – Heritage Specialist
Wouter Fourie – Senior Heritage Specialist

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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 done and identified heritage resources are formally protected.

Archaeological and paleontological 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 the NHRA, permits are required to damage, destroy, alter, or disturb them. People who already possess 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.

In addition to the formal protection of culturally significant graves, all graves, which are older than 60 years and are not in a formal cemetery (such as ancestral graves in rural areas), are protected. The legislation protects the interests of communities that have an interest in the graves - they should be consulted before any disturbance takes place. The graves of victims of conflict and those associated with the liberation struggle are to 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 construction company's cost. Thus, the construction company 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 paleontological 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 pre-historic 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 are under 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 are under 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 administrated 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 OF TEAM

WOUTER FOURIE
Professional Heritage Specialist and Professional Archaeologist and Director PGS Heritage

Summary of Experience

Specialised expertise in Archaeological Mitigation and excavations, Cultural Resource Management and Heritage Impact Assessment Management, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management, Geographic Information Systems, including *inter alia* -

Involvement in various grave relocation projects (some of which relocated up to 1000 graves) and grave "rescue" excavations in the various provinces of South Africa
Involvement with various Heritage Impact Assessments, within South Africa, including -

- Archaeological Walkdowns for various projects
- Phase 2 Heritage Impact Assessments and EMPs for various projects
- Heritage Impact Assessments for various projects
- Iron Age Mitigation Work for various projects, including archaeological excavations and monitoring
- Involvement with various Heritage Impact Assessments, outside South Africa, including -
  - Archaeological Studies in Democratic Republic of Congo
  - Heritage Impact Assessments in Mozambique, Botswana and DRC
  - Grave Relocation project in DRC

Key Qualifications

BA [Hons] (Cum laude) - Archaeology and Geography - 1997
BA - Archaeology, Geography and Anthropology – 1996
MPhil – Conservation of the Built Environment - Current
Professional Archaeologist - Association of Southern African Professional Archaeologists (ASAPA) - Professional Member
Accredited Professional Heritage Specialist – Association of Professional Heritage Practitioners (APHP)
CRM Accreditation (ASAPA) -

- Principal Investigator - Grave Relocations
- Field Director – Iron Age
- Field Supervisor – Colonial Period and Stone Age
- Accredited with Amafa KZN

Key Work Experience

2003- current - Director – PGS Heritage (Pty) Ltd
2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand
2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd
2000-2004 – CEO – Matakoma Consultants
1998-2000 - Environmental Coordinator – Randfontein Estates Limited. Randfontein, Gauteng
1997-1998 - Environmental Officer – Department of Minerals and Energy. Johannesburg, Gauteng

Worked on various heritage projects in the SADC region including, Botswana, Mozambique and the Democratic Republic of the Congo

MARKO HUTTEN
Professional Archaeologist

Name:	Marko Hutten
Profession:	Archaeologist
Date of birth:	1971-06-24
Parent Firm:	PGS Heritage a
Position at Firm:	Freelance Archaeologist
Years with firm:	6
Years of experience:	18
Nationality:	South African
HDI Status:	White Male

EDUCATION:

Name of University or Institution	**:**	University of Pretoria
Degree obtained	**:**	BA
Major subjects	**:**	Archaeology & Anthropology
Year	**:**	1996

Name of University or Institution	**:**	University of Pretoria
Degree obtained	**:**	BA [Hons]
Major subjects	**:**	Archaeology
Year	**:**	1997

Professional Qualifications:
Professional Archaeologist - Association of Southern African Professional Archaeologists - Professional Member
CRM Accreditation:
- Field Director - Iron Age
- Field Director - Grave Relocation

Languages:
Afrikaans
English – Speaking (Good) Reading (Good), Writing (Good)

KEY QUALIFICATIONS

Archaeological mitigation and excavations, Social consultation on grave relocation projects, Cultural Resource Management and Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Anthropology, Applicable survey methods, Fieldwork and project management.

EXPERIENCE

Archaeological Impact Assessments

1998 – 2008
Performed 300+ Archaeological Impact Assessments (1st phase). Clients include:
- Vodacom
- Telkom
- Eskom
- Roads Agency of Limpopo (RAL)
- Department of Water Affairs and Forestry (DWAF)
- South African National Parks (SANParks)

- Impala Platinum
- Various Environmental Impact Assessment Companies such as: Naledzi Environmental Consultants; Tekplan Environmental; Lokisa Environmental Consulting

Grave Relocation Projects:

- Nandoni Dam Grave Relocation Project, ± 1000 graves, 2000/01 (Field Director)
- Tavistock Colliery Grave Relocation Project, ± 700 graves, 2002 (Field Director)
- Marula Platinum Grave Rescue Project, x 2 graves, 2003 (Field Director)
- Silverlakes Grave Relocation Project, x 5 graves, 2005 (Field Director)
- Bela-Bela (Outpost) Grave Relocation Project, x 80 graves, 2008 (Field Director)
- Potgieters Rus Platinum Mine Grave Relocation Project, x 16 graves, 2008 (Field Director)
- New Vaal Colliery Grave Relocation Project, x 1700 graves, 2007 (Field Director)
- Shakadza Road Upgrade Grave Rescue Project, x 1 grave, 2007 (Field Director)
- Mapungubwe Grave Repatriation Project 2007 (Field Supervisor)

Second Phase Investigations/Excavations:
(Including Site Stabilization and Rehabilitation)

- Nandoni Dam Archaeological Project 1998 (Field Supervisor)
- Nandoni Dam Archaeological Project 1998 – 1999 (Field Director)
- Mapungubwe Rehabilitation Project 2003 (Field Director)
- Schroda Rehabilitation Project 2006 (Field Director)
- K2 Rehabilitation Project 2006 (Field Director)
- Mapungubwe Rehabilitation Project 2006 (Field Director)
- Shakadza Rescue and Rehabilitation Project 2007 (Field Director)

2008-2011

Archaeological Impact Assessments (1st phase):
(Projects in conjunction with, in brackets):

- Premier Mine Heritage Survey 2008 (PGS)
- Gope Transmission Line Survey 2008 (Botswana– Archaeology Africa)
- Argent Siding Heritage Survey 2008 (Archaeology Africa)
- Morgenzon Pipe Line Heritage Survey 2008 (Archaeology Africa)
- Klipfontein Heritage Survey 2008 (PGS)
- Spitzkop Mine Heritage Survey 2008 (PGS)
- Elandsfontein Heritage Survey 2008 (PGS)
- Makobe Township Heritage Survey 2008
- Tswinga Township Heritage Survey 2008
- Mankweng Borrow Pits Heritage Survey 2008
- Knapdaar Heritage Survey 2008 (PGS)
- Hotazel Heritage Survey 2008 (PGS)
- Lisbon Township Heritage Survey 2009
- Koert Louw Heritage Survey 2009 (PGS)
- Knapdaar Heritage Survey 2009 (PGS)
- De Wittekrans Heritage Survey 2009 (PGS)
- Ga-Kgapane Township Heritage Survey 2009
- Guernsey Eco-estate Heritage Survey 2009
- De Deur Heritage Survey 2009 (PGS)
- Bultfontein Heritage Survey 2009 (PGS)
- Optimum Mine Heritage Survey 2009
- Gorkum Eco-Estate Heritage Survey 2009
- Planknek Pipe line Heritage Survey 2009
- Regorogile Ext. 9 Heritage Survey 2009

- Haddon Agricultural Heritage Survey 2009
- Jansenpark Residential Development Heritage Survey 2009
- Klein Kariba Residential Development Heritage Survey 2009
- Kangala Mine Heritage Survey 2009 (PGS)
- Hoedspruit Juice Factory Heritage Survey 2009
- Kameelfontein Heritage Survey 2009 (PGS)
- Leolo Township Heritage Survey 2010
- Rietpol Agricultural Development Heritage Survey 2010
- Lwamondo Mining Heritage Survey 2010
- VanderBijlpark Heritage Survey 2010 (PGS)
- Kongoni Mine Heritage Survey 2010 (PGS)
- Lehating Mine Heritage Survey 2010 (PGS)
- Donkerpoort Township Heritage Survey 2010
- Klerksdorp Township Heritage Survey 2010 (PGS)
- Boikarabelo Heritage Survey 2010 (PGS)
- Mountain View Township Heritage Survey 2010
- De Put Township Heritage Survey 2010
- Vygeboomfontein Eco-Estate Heritage Survey 2010
- Vuyani-Neptune Power Line Heritage Survey 2010 (PGS)
- Gamma-Kappa Power Line Heritage Survey 2010 (PGS)
- Olifants River Bridge Heritage Survey 2010
- Bon Accord Mine Heritage Survey 2010 (PGS)
- Olifants River Water Scheme Heritage Survey 2010 (PGS)
- Buffelskloof Mine Heritage Survey 2010 (Gem-Science)
- Vlakvarkfontein Mine Heritage Survey 2010 (Gem-Science)
- Spitskop Solar Park Heritage Survey 2011
- Geluksfontein farm Heritage Survey 2011
- Leeuwvallei Town Development Heritage Survey 2011
- De Aar Solar Park Heritage Survey 2011 (PGS)
- Onbekend Mine Heritage Survey 2011 (Gem-Science)
- Witkop Solar Park Heritage Survey 2011
- Bel-Bela Solar Park Heritage Survey 2011
- Delta Solar Park Heritage Survey 2011
- Madibeng Pipe Line Heritage Survey 2011 (PGS)
- Soutpan Solar Park Heritage Survey 2011
- Vlakvarkfontein Mine Heritage Survey 2011 (PGS)
- Vuwani & Valdezia Pipe Lines Heritage Survey 2011