



PGS
HERITAGE

**UPGRADE OF ROAD D4407 BETWEEN HLUVUKANI
AND TIMBAVATI, ROAD D4409 AT WELVERDIEND AND
ROAD D4416/2 BETWEEN WELVERDIEND AND ROAD
P194/1 IN THE BOHLABELA REGION OF THE
MPUMALANGA PROVINCE**

Heritage Impact Assessment

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+ 27 (0) 12 332 5305



+27 (0) 86 675 8077



contact@pgsheritage.co.za



PO Box 32542, Totiusdal, 0134

Offices in South Africa, Kingdom of Lesotho and Mozambique

Head Office:
906 Bergarend Streets
Waverley, Pretoria,
South Africa

Directors: HS Steyn, PD Birkholtz, W Fourie

Declaration of Independence

I, Cherene de Bruyn, declare that –

General declaration:

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

Disclosure of Vested Interest

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

HERITAGE CONSULTANT:

PGS Heritage (Pty) Ltd

CONTACT PERSON:

Cherene de Bruyn – Archaeologist



Tel: +27 (0) 12 332 5305

Email: cherene@pgsheritage.co.za

SIGNATURE:



ACKNOWLEDGEMENT OF RECEIPT

Report Title	<i>UPGRADE OF ROAD D4407 BETWEEN HLUVUKANI AND TIMBAVATI, ROAD D4409 AT WELVERDIEND AND ROAD D4416/2 BETWEEN WELVERDIEND AND ROAD P194/1 IN THE BOHLABELA REGION OF THE MPUMALANGA PROVINCE</i>		
Control	Name	Signature	Designation
Author	Cherene de Bruyn		Archaeologist/ PGS Heritage
Internal review	Wouter Fourie		Principal Heritage Specialist
Reviewed	Nick Gates		Senior Environmental Consultant

CLIENT: NCC Environmental Services (Pty) Ltd

CONTACT PERSON: Nick Gates
Tel: 073 199 8431
Email: Nickg@ncc-group.co.za

SIGNATURE: _____

EXECUTIVE SUMMARY

PGS Heritage (Pty) Ltd (PGS) was appointed by NCC Environmental Services (Pty) Ltd (NCC Environmental Services) to undertake a Heritage Impact Assessment (HIA) which will serve to inform the 24G application as well as a Basic Environmental Assessment (BAR) and Environmental Management Programme (EMPr) for the upgrade of Road D4407 between Hluvukani and Timbavati (7.82 Km), Road D4409 at Welverdiend (6.88 Km) and Road D4416/2 between Welverdiend and Road P194/1 (1.19 Km) in the Bohlabela region of the Mpumalanga Province.

Heritage resources are unique and non-renewable and as such any impact on such resources must be seen as significant.

The HIA has shown that the study area and surrounding area has some heritage resources situated within the proposed development boundaries. Through data analysis and a site investigation the following issues were identified from a heritage perspective.

Heritage Sites

Heritage Sites in the vicinity of the Hluvukani Road Project Area

The fieldwork identified 21 heritage features including Churches (**HR-01, HR-02**); historical buildings and ruins (**HR-03 to HR-07**) and graves and informal burial grounds (**HR-08 to HR-21**).

Historical structures

HR-01 and **HR-02** (Churches) have a low heritage significance with a heritage grading of IIIC.

The impact significance before mitigation on the Churches will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-03 to HR-05 (historical houses) it is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on the Farmhouse will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-06 (old farm Infrastructure) and **HR-07** (concrete fountain) is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on **HR-06** will be MODERATE negative before mitigation, while the impact significance before mitigation on **HR-07** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is very likely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

Burial Grounds and graves

HR-08 to **HR-21** have a high heritage rating and a heritage grading of IIIA.

The impact significance before mitigation on **HR-08** and **HR-09** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact has already occurred.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-10** to **HR-14** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

The impact significance before mitigation on **HR-15** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact has already occurred.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-16** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-17** to **HR-21** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended

Palaeontological Impacts

The proposed area of the project footprint occurs in an area where the palaeontology is assessed as being entirely of Insignificant/Zero sensitivity. As such no paleontological studies are required.

General

It is the author's considered opinion that overall impact on heritage resources is High to Low. Provided that the recommended mitigation measures are implemented, the impact would be acceptably low or could be totally mitigated to the degree that the project could be approved from a heritage perspective. The management and mitigation measures as described in Section 6 of this report have been developed to minimise the project impact on heritage resources.

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TERMINOLOGY AND ABBREVIATIONS

Archaeological resources

This includes:

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

Cultural significance

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

Development

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

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

Early Stone Age

The archaeology of the Stone Age between 700 000 and 3 300 000 years ago.

Fossil

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

Heritage

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

Heritage resources

This means any place or object of cultural significance and can include (but not limited to) as stated under Section 3 of the NHRA,

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

Holocene

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

Late Stone Age

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

Late Iron Age (Early Farming Communities)

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

Middle Iron Age

The archaeology of the period between 900-1300AD, associated with the development of the Zimbabwe culture, defined by class distinction and sacred leadership.

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.

Table 1 – List of abbreviations used in this report

Abbreviations	Description
AIA	Archaeological Impact Assessment
APHP	Association of Professional Heritage Practitioners
ASAPA	Association of South African Professional Archaeologists
CRM	Cultural Resource Management
DEA	Department of Environmental Affairs
DPWRT	Department of Public Works, Roads and Transport
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
EIA	Early Iron Age
EIAs	Environmental Impact Assessment
EIAs practitioner	Environmental Impact Assessment Practitioner
ESA	Earlier Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&AP	Interested & Affected Party
IAIASA	International Association for Impact Assessment South Africa
LAS	Land Availability Stream
LCTs	Large Cutting Tools
LIA	Late Iron Age
LSA	Late Stone Age
MIA	Middle Iron Age
MSA	Middle Stone Age
NCC Environmental Services	NCC Environmental Services (Pty) Ltd
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No 25 of 1999)
NMBM	Nelson Mandela Bay Municipality
PGS	PGS Heritage (Pty) Ltd
PIA	Palaeontological Impact Assessment
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

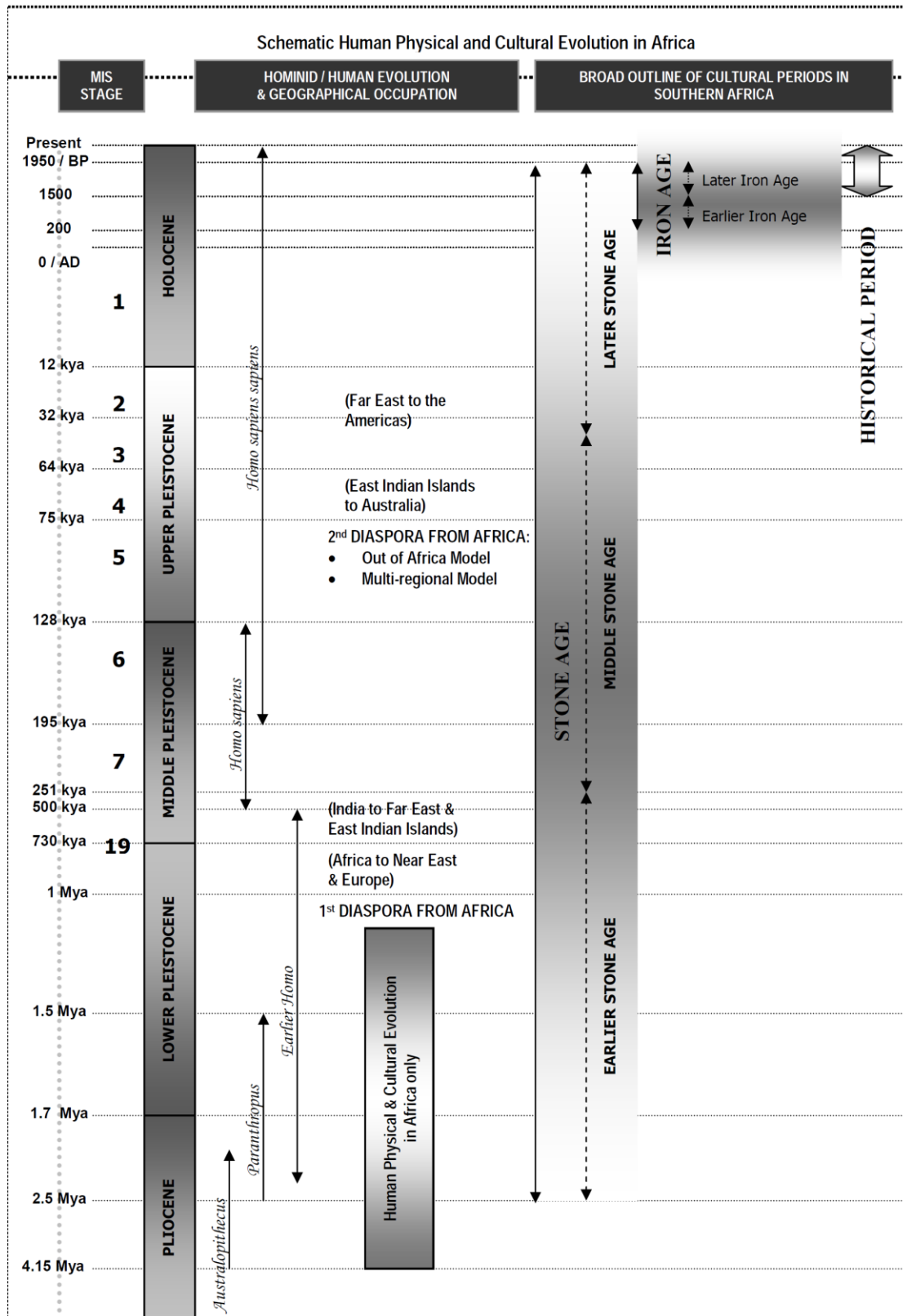


Figure 1 – Human and Cultural Timeline in Africa (Morris, 2008)

1 INTRODUCTION

PGS Heritage (Pty) Ltd (PGS) was appointed by NCC Environmental Services (Pty) Ltd (NCC Environmental Services) to undertake a HIA which will serve to inform the 24G application, BAR and EMPr for the upgrade of Road D4407 between Hluvukani and Timbavati (7.82 Km), Road D4409 at Welverdiend (6.88 Km) and Road D4416/2 between Welverdiend and Road P194/1 (1.19 Km) in the Bohlabela region of the Mpumalanga 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. The HIA aims to inform the EIA in the development of a comprehensive EMPr to assist the project applicant 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 (Act 25 of 1999) (NHRA).

1.2 Specialist Qualifications

This Heritage Impact Assessment was compiled by PGS.

The staff at PGS have a combined experience of nearly 40 years in the heritage consulting industry. PGS and its staff have extensive experience in managing HIA processes. PGS will only undertake heritage assessment work where they have the relevant expertise and experience to undertake that work competently.

Cherene de Bruyn author of this report, is registered with the Association of Southern African Professional Archaeologists (ASAPA) as a Professional Archaeologist and is accredited as a Principal Investigator and Field Director, she is further also a member of the International Association for Impact Assessment South Africa (IAIASA). She holds a MA in Archaeology, BSc (Hons) in Physical Anthropology and a BA (Hons) in Archaeology.

Wouter Fourie, the Project Coordinator, is registered with the 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).

1.3 Assumptions and Limitations

Not detracting in any way from the comprehensiveness of the research undertaken, it is necessary to realise that the heritage resources located during the desktop research do not necessarily represent all the possible heritage resources present within the area.

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.

Please note that the heritage visibility was obscured in some areas due to dense vegetation, illegal dumping and construction activities that have already occurred.

1.4 Legislative Context

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

1.4.1 Notice 648 of the Government Gazette 45421

Although minimum standard for archaeological (2007) and palaeontological (2012) assessments were published by SAHRA, GN.648 requires sensitivity verification for a site selected on the national web based environmental screening tool for which no specific assessment protocol related to any theme has been identified. The requirements for this GN is listed in **Table 2** and the applicable section in this report noted.

Table 2 - Reporting requirements for GN648

GN 648	Relevant section in report	Where not applicable in this report
2.2 (a) a desk top analysis, using satellite imagery;	section 4	
2.2 (b) a preliminary on-site inspection to identify if there are any discrepancies with the current use of land and environmental status quo versus the environmental sensitivity as identified on the national web based environmental screening tool, such as new developments, infrastructure, indigenous/pristine vegetation, etc.	section 4.6	
2.3(a) confirms or disputes the current use of the land and environmental sensitivity as identified by	section 4.6	

GN 648	Relevant section in report	Where not applicable in this report
the national web based environmental screening tool;		
2.3(b) contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity;	section 4.5	

1.4.2 NEMA – Appendix 6 requirements

The HIA report has been compiled considering the NEMA Appendix 6 requirements for specialist reports as indicated in the table below. For ease of reference the table below provides cross references to the report sections where these requirements have been addressed. It is important to note, that where something is not applicable to this HIA, this has been indicated in the table below.

Table 3 - Reporting requirements as per NEMA Appendix 6 for specialist reports

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
1.(1) (a) (i) Details of the specialist who prepared the report	Page ii of Report – Contact details and company	-
(ii) The expertise of that person to compile a specialist report including a curriculum vita	Section 1.2 – refer to Appendix B	-
(b) A declaration that the person is independent in a form as may be specified by the competent authority	Page ii of the report	-
(c) An indication of the scope of, and the purpose for which, the report was prepared	Section 1.1	-
(cA) An indication of the quality and age of base data used for the specialist report	Section 3	-
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 5	-
(d) The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment	Section 4	The vegetation density does influence visibility – however the vegetation cover for the area was consistently the same during the site visit
(e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used	Section 3 and Appendix A	
(f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	Section 4 and 6	
(g) An identification of any areas to be avoided, including buffers	Section 4	

Requirements of Appendix 6 – GN R326 EIA Regulations of 7 April 2017	Relevant section in report	Comment where not applicable.
(h) A map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	Section 4 and 6	
(i) A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.3	-
(j) A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives, on the environment	Section 4.6 and 6	
(k) Any mitigation measures for inclusion in the EMPr	Section 6 and 7	
(l) Any conditions for inclusion in the environmental authorisation		Non required
(m) Any monitoring requirements for inclusion in the EMPr or environmental authorisation	Section 6	
(n)(i) A reasoned opinion as to whether the proposed activity, activities or portions thereof should be authorised and	Section 6 and 7	
(n)(iA) A reasoned opinion regarding the acceptability of the proposed activity or activities; and		
(n)(ii) If the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan	Section 6	-
(o) 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 EMPr process.
(p) A summary and copies if any comments that were received during any consultation process		Not applicable. To date no comments regarding heritage resources that require input from a specialist have been raised.
(q) Any other information requested by the competent authority.		Not applicable.
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	NEMA Appendix 6 and GN648	

1.4.3 *The National Heritage Resources Act*

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

The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of Cultural Resource Management (CRM) those resources specifically impacted on by development as stipulated in Section 38 of NHRA. This study falls under s38(8) and requires comment from the relevant heritage resources authority.

2 SITE LOCATION AND DESCRIPTION

2.1 Locality and Site Description (provided by Habitat Link Consulting)

The proposed project area is located on the Farms Welverdiend 206 KU and Clare 220 KU (**Figure 2**). The proposed project area is located between the towns of Hluvukani, Welverdiend and Timbavati at coordinates: 24°36'16.43"S 31°20'2.79"E. The project is located in the Bohlabela region of the Mpumalanga Province about 70 km north from Hazyview in the Bushbuckridge Local Municipality, within the Ehlanzeni District Municipality.

The following infrastructure is encountered in the area:

- Provincial roads (R40, R531);
- Informal residential properties;
- agricultural fields and gardens;
- Bulk water pipelines;
- Water reticulation in urban areas;
- Overhead powerlines;
- Communications Towers;
- Reservoirs and;
- Informal shops and businesses.

Upgrade of Roads between Hluvukani And Timbavati



Locality Map

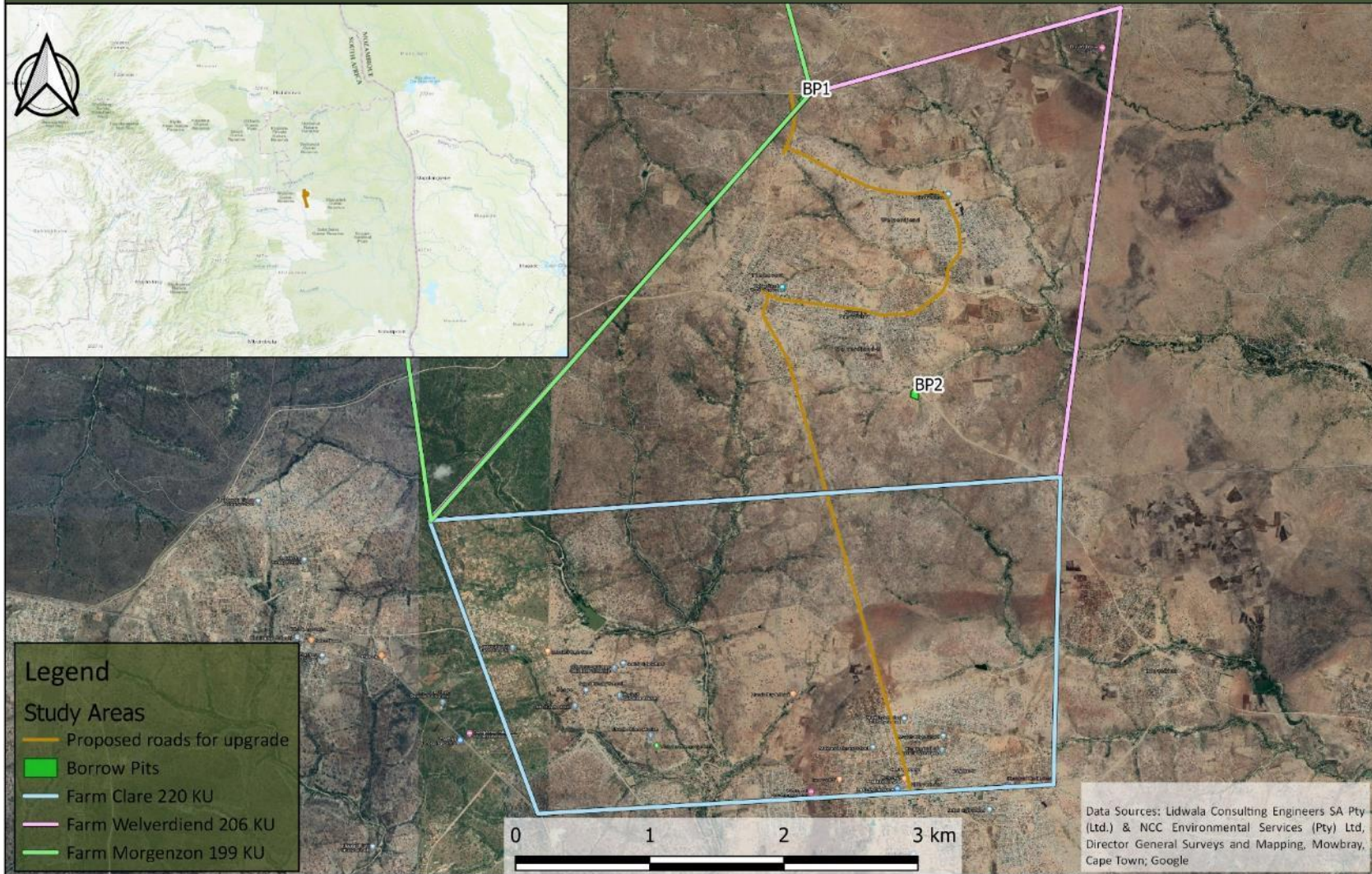


Figure 2 – Locality map of the Hluvukani and Timbavati Road Upgrade project area

2.2 Project description (provided by NCC Environmental Services)

The Mpumalanga Province, Department of Public Works, Roads and Transport (DPWRT) proposed the upgrading of road D4407 between Hluvukani and Timbavati (7.82 km), road D4409 at Welverdiend (6.88 km) and road D4416/2 between Welverdiend and road P194/1 (1.19 km) in the Bohlabela region of the Mpumalanga Province. The project comprises of the upgrading of roads D4407 (red line), D4409 (yellow line) and D4416 (green line) (**Figure 3**). D4407 start in Hluvukani and is a total length of 7.82 km up to Timbavati, where it intersects with D4409. The D4409 starts at the intersection with the D4407, runs through Welverdiend and end with the intersection with the D4416 and has a total length of 6.88 km. D4416 start at the intersection with D4409 and ends at P194/1 with a total length of 1.19 km. The total length of roads under investigation amounts to 15.89 km. The start of the project is at the junction with D3930, this intersection is surfaced, but there is a valve box for a water main very close to the road, which could influence the bellmouth radius with the upgrade of this intersection. The road travels through a build-up area (Hluvukani) for about 2 km, thereafter it is mainly farmlands until the village of Timbavati commences. The D4407 ends at a T-junction in Timbavati at the D4409. The D4409 has a total length of 6.88 km starting in Timbavati and forms part of the through road leading through Welverdiend, the upgraded route ends at a T-junction with the D4416. Timbavati and Welverdiend build-up areas continues for about two-thirds of the route, thereafter it is mainly farmlands. The D4416 ends in a T-junction at the P194/1. There is a hairpin bend about 300m before the end of the road, this curve is likely to be below standards with the upgrade of the road alignment.

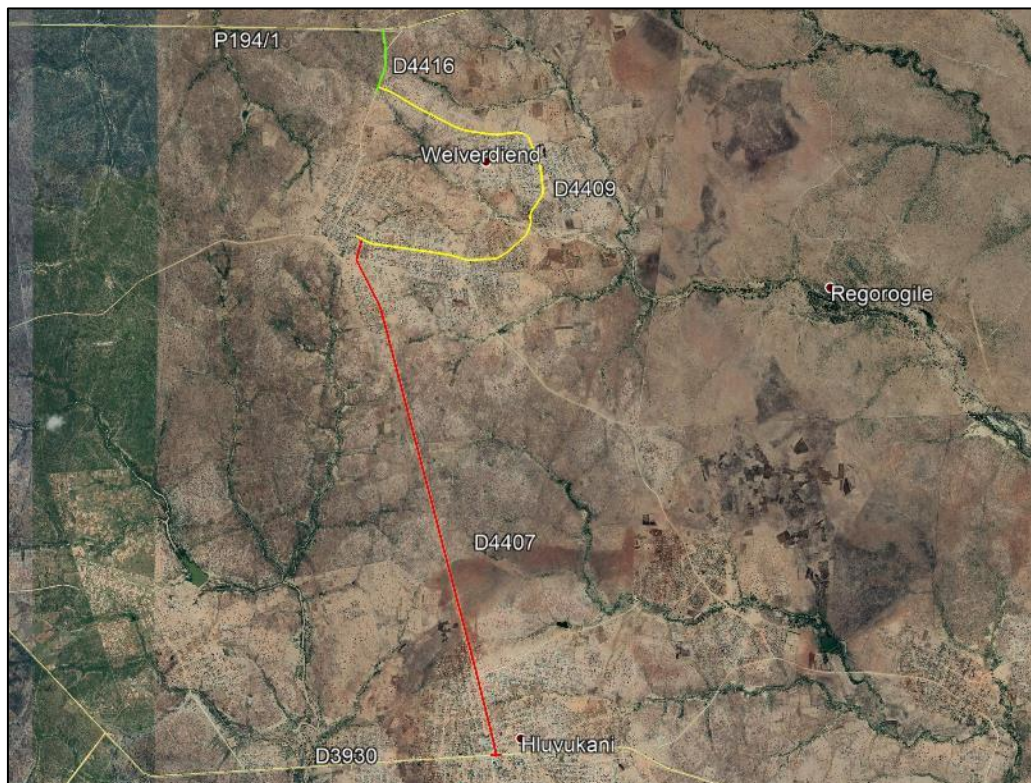


Figure 3 - Proposed roads

Currently the project has gone ahead and is well into construction. In terms of work undertaken to date the following activities have commenced:

- Establishment
- Clearing and Grubbing
- Borrow pit excavations
- Fencing
- Bridge construction
- Culvert installations
- Bypass construction and maintenance
- Moving of existing services
- Borehole drilling
- Cut to spoil
- Cut to fill
- Roadbed construction
- Selected layer construction

2.2.1 *Consideration of Alternatives (provided by NCC Environmental Services)*

Overall, the existing horizontal alignment were followed. Re-alignment for the hairpin bend (**Figure 4**) before the intersection with P194/1 were done and is indicated in **Figure 5**. Alternative A were to extend the current straight from Timbavati, eliminating the triangle route. This option has been discussed with the client adopted as the best option and town planners have been appointed to deal with the servitude registration and de-registration of the existing reserve. Alternative B was to intersect the P194/1 at a different position as to eliminate the hairpin bend. This alternative also has disadvantages, as there is a level difference between the P194/1 and the D4416. Alternative B resulted in increased earthworks and it was decided not to pursue this option.

Subsequent to the two alternatives, an additional alternative alignment alternative was added and will intersection with the P194/1 some 400 meters to the west and will then align southwards to D4416 closer to the Hluvukani turn off (**Figure 6**).

2.1 Environmental applications relevant to this report

This report aims to address the heritage assessment requirements for the two application as lodged by NCC for the overall road project. This includes a 24G application as well as a Basic Environmental Assessment (BAR) application. The two applications are described in **Table 4**.

Table 4 – Environmental processes as contemplated in this report

24G	BAR
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<p>The project comprises of the upgrading of roads D4407, D4409 and D4416.</p> <p>D4407 start in Hluvukani and is a total length of 7.82 km up to Timbavati, where it intersects with D4409.</p> <p>The D4409 starts at the intersection with the D4407, runs through Welverdiend and end with the intersection with the D4416 and has a total length of 6.88 km.</p> <p>D4416 starts at the intersection with D4409 and ends at P194/1 with a total length of 1.19 km. The total length of roads under investigation amounts to 15.89 km.</p>	<p>The complete project comprises of the upgrading of roads D4407, D4409 and D4416.</p> <p>D4407 start in Hluvukani up to Timbavati with a total length of 7.82 km, where it intersects with D4409. The D4409 starts at the intersection with the D4407, runs through Welverdiend and end with the intersection with the D4416 and has a total length of 6.88 km.</p> <p>D4416 was indented to start in Welverdiend (intersects with D4409) and ends at P194/1 with a total length of 1.19 km.</p> <p>The current existing position of the intersection (P194/1) does not conform to SANRAL standards and must be moved.</p> <p>The newly proposed intersection location will require a new section road as opposed to the upgrading of existing roads (D4407 to D4416). This section is currently undertaking a Section 24G process.</p>
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Figure 4 - Hairpin bend before intersection with P194/1 (provided by NCC Environmental Services)

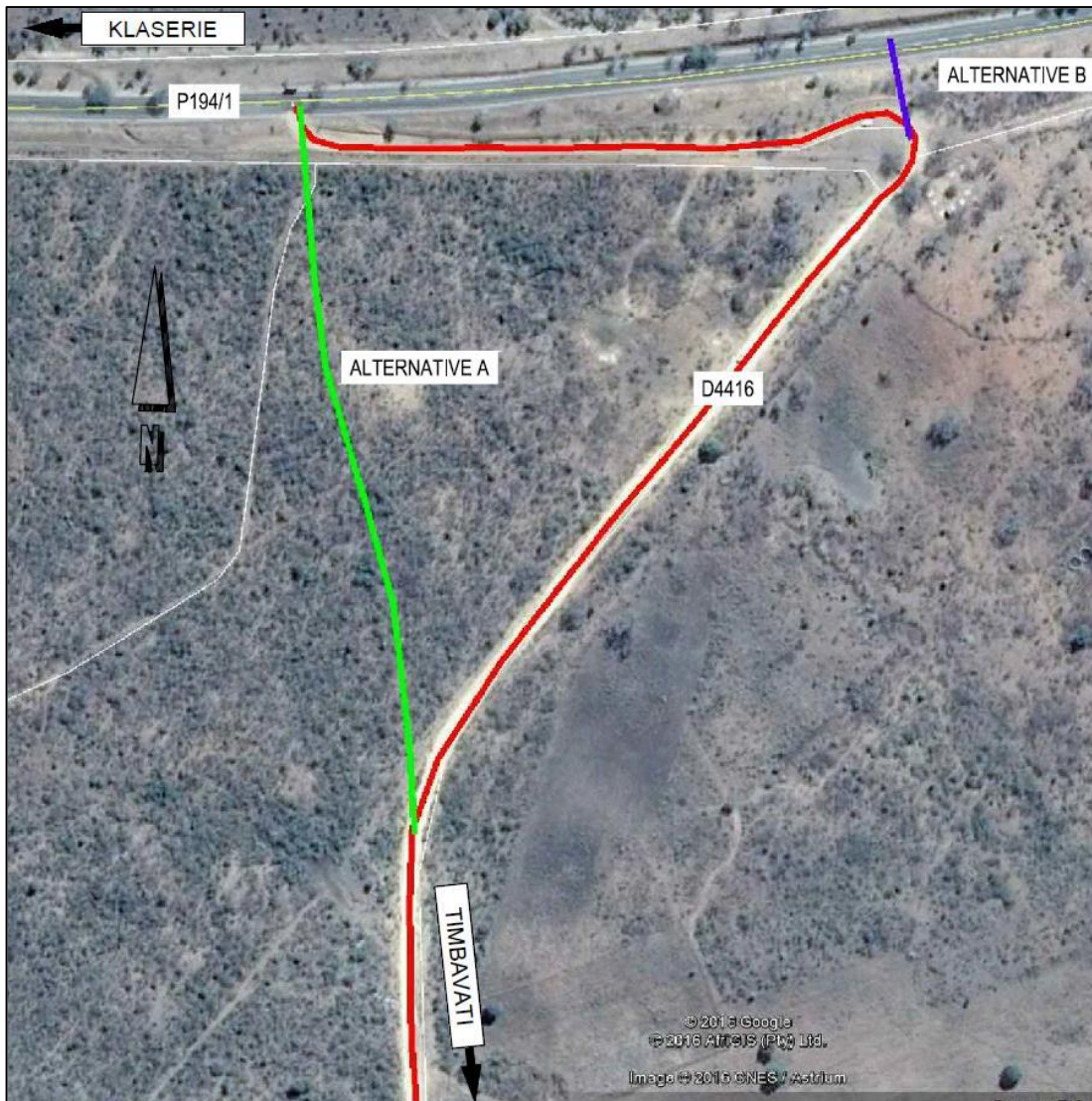


Figure 5 - Hairpin bend alternative routes (provided by NCC Environmental Services)



Figure 6 – proposed new alternative (provided by NCC Environmental Services)

3 CURRENT STATUS QUO

3.1 Site Description

The project area falls within the existing residential and agricultural areas of towns of Hluvukani, Welverdiend and Timbavati

Existing surrounding land uses associated with the project area include a combination of:

- informal settlements
- farming and agricultural areas, and
- dirt roads.

As a result, the vast majority of the Hluvukani Road project area footprint overlays highly disturbed terrain and a pre-existing road. Overall, the accessibility of the project footprint area was fairly good. However, some roads were closed due to construction that had already started. Although the site has been disturbed by previous agricultural activities, visibility was fairly good (**Figure 7 - Figure 27**).



Figure 7 – Access to the site from the P194/1



Figure 8 – Access to the site from the D3930



Figure 9 – Access to the site from the junction between the D3930 and D4407



Figure 10 – View of the D4416



Figure 11 – View of proposed Alternative A



Figure 12 – View of the D4409 in Welverdiend



Figure 13 - Mtembeni Primary School located next to the D4409



Figure 14 – Bridge construction site on the D4409



Figure 15 – Bridge construction site on the D4409 (View taken facing south)



Figure 16 – Sand dumps observed throughout the area



Figure 17 - Illegal dumping throughout project area



Figure 18 - Several roads are closed due to construction in Welverdiend



Figure 19 – Communication towers found in the project area



Figure 20 – Powerlines found throughout the project area



Figure 21 – Manholes found next to the project area



Figure 22 – Culvert 27 near Welverdiend



Figure 23 – View of the D4407 between Welverdiend and Hluvukani



Figure 24 – Fields next to roads used by community for grazing of cattle and goats



Figure 25 – Shops next to the D4407 in Hluvukani



Figure 26 – Houses next to the D4407 in Hluvukani



Figure 27 – Reservoir located next to the D4407 in Hluvukani

3.2 Overview of Study Area and Surrounding Landscape

Southern Africa has one of the longest human species occupations record in the world. The occupation dates to approximately 2 million years ago (Mitchell 2002). The archaeology of South Africa is divided into three periods, which are mainly the Stone Age, Iron Age and the Historical Period. Each period is characterised by unique cultural material.

DATE	DESCRIPTION
2.5 million to 250 000 years ago	The Earlier Stone Age (EIA) is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these technological phases is known as Oldowan which is associated with crude flakes and hammer stones and dates to approximately 2 million years ago. The second technological phase in the Earlier Stone Age of Southern Africa is known as the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial handaxe. The Acheulian phase dates back to approximately 1.5 million years ago. In the Mpumalange Province, ESA artefacts including choppers, hand axes and cleavers have also been found at Maleoskop on the farm Rietkloof, located 60 km north of Middelburg (Esterhuysen & Smith, 2007). <i>No ESA sites are known from the immediate vicinity of the footprint area.</i>
250 000 to 40 000 years ago	The Middle Stone Age (MSA) 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 (Korsman, & Meyer, 1999). In the Mpumalanga Province, MSA tools have been found at Bushman Rock

DATE	DESCRIPTION
	<p>Shelter, a site continuously occupied during this period, on the farm Klipfonteinhoek in the Ohrigstad District, located approximately 75 km west of Hluvukani (Esterhuysen & Smith, 2007). Near Malelane, ochre was mined at Dumaneni during the MSA (Bornman, 1995; Van Wyk Rowe, 2015).</p> <p><i>No MSA sites are known from the immediate vicinity of the footprint area.</i></p>
40 000 years ago, to the historic past	<p>The Later Stone Age (LSA) is the third phase identified in South Africa's Stone Age history. This phase in human history is associated with an abundance of very small stone artefacts or microliths. Several LSA rock engraving sites have been found in the Mpumalanga Province near Lydenburg, Nelspruit, White River, Ermelo and the southern part of the Kruger National Park (Smith & Zubieta, 2007; Pistorius, 2014). Several LSA artefacts were also found in the upper layers at Bushman Rock Shelter (Esterhuysen & Smith, 2007). Near Badplaas, also known as eManzana, several LSA sites were found in close proximity of the Nhlanzatshe River on the farm Honingklip (Esterhuysen & Smith, 2007). Apart from stone tools several rock art panels, beads, LSA stone-walling and Iron Age pottery of the Eiland facies were also found (Korsman & Plug, 1994; Esterhuysen & Smith, 2007). Several LSA sites have also been found in the Kruger National Park (Bergh, 1999).</p> <p><i>No LSA sites are known from the immediate vicinity of the footprint area.</i></p>
AD 200 – AD 900	<p>The earliest phase in the Iron Age history of Southern African is known as the Early Iron Age (EIA). The first Bantu-speaking farmers moved into the Mpumalanga region around 500 AD (Esterhuysen & Smith, 2007). Several EIA sites have been found in the Mpumalanga Province. These sites seem to be located near water sources which were most likely played an important role in Iron Age agricultural activities (Esterhuysen & Smith, 2007). Welgelegen Shelter located near Ermelo, which is approximately 130 km southwest of Barberton, LSA tools and Iron Age pottery were found which is interpreted as evidence of the co-existence of farming and hunter-gatherer groups on one site (Esterhuysen & Smith, 2007).</p> <p>The earliest occupation to occur in the Lowveld (the section between the Drakensberg, Mozambique and the southern part of the Kruger National Park), was at Silver Leaves, around AD 280 - 450, a site located close to Tzaneen (Van Wyk Rowe, 2009). The Mzonjani pottery, followed Silver leaves facies, and dates to AD 450- 750 and is found within the Limpopo, KwaZulu-Natal, Mpumalanga and Gauteng Provinces (Maggs, 1980; Huffman, 2007). Two periods of occupation, the first around 600AD, and second around 900-1100 AD have been found at the Lydenburg head site (Esterhuysen & Smith, 2007). The Lydenburg head site is located 150km south-west of Hluvukani. The ceramic heads found at the site date to the second occupation of the site. During EIA Copper was mined at two major centres to the north of Mpumalanga (Phalaborwa and Messina) from AD 750 (Esterhuysen & Smith, 2007).</p> <p><i>No EIA sites are known from the immediate vicinity of the footprint area.</i></p>
AD 900 – AD1300	<p>The second phase in the Iron Age history of Southern Africa is known as the Middle Iron Age (MIA). Welgelegen Shelter, located on the banks of the Vaal River near Ermelo was occupied at around AD 1200 by both hunter-gatherers and Iron age farmer communities (Esterhuysen & Smith, 2007). Iron tools, pottery and LSA tools have been found in the shelter suggesting the two groups occupied the shelter at the same time (Esterhuysen & Smith, 2007).</p> <p><i>No MIA sites are known from the immediate vicinity of the footprint area.</i></p>
AD 1300 – AD 1850	<p>The third and final phase in the Iron Age history of Southern Africa is known as the Late Iron Age (LIA). The LIA is distinguished from the EIA in Mpumalanga by the change in ceramic styles as well as through the numerous extensive stonewalled sites that are found throughout the region (Marker & Evers, 1976). Moorpark type walling have also been found in the Limpopo and Mpumalanga Province, and is associated with Nguni speaking groups who migrated from the KwaZulu-Natal Province (Huffman, 2004). Lombard (1980) states that corbelled stone huts (which are also associated with the Late Iron Age) are found on the farms Tafelkop 270 and Middelpaat 271. These farms are located some 14 kilometres north-west of the present study area. According to Huffman (2007) corbelled stone huts appear to be associated with the so-called Type V Iron Age sites. These Type V settlements date from the period 1700 to 1850. Lombard (1980) also mentions a LIA group he refers to as the Nhlapo people and indicates that when the first white people came to stay in the Ermelo district, they already found the Nhlapo people in the vicinity of Maviristad. Myburgh (1956) refers to the followers of George Nhlapo who resided on the farm Witbank in the Ermelo District.</p>

DATE	DESCRIPTION
	<p>Smaller farming communities including the Pai and Pulana settled around the Baberton and Nelspruit regions (Celliers, 2012a). During the Difiqane or Mfecane, around the early 1820's - 1830's many groups who settled in the Mpumalanga region were displaced as a result of Mzilikazi' Ndebele who moved through the area (Celliers ,2012a).</p> <p>The Voortrekkers under leadership of Andries Hendrik Potgieter moved through the Mpumalanga Province in the 1840's to settle at Ohrigstad, which was first established in 1845 (Celliers, 2012). It was here that the Voortrekkers and the Pedi Chief entered negotiations that would result in them acquiring farming land for which in turn they would provide protection from the Swazi's (Giliomee, 2003; Celliers, 2012).</p> <p>In the first half of the nineteenth century the Mpumalanga region as it was infested with Tsetse flies (Shillington, 1995; Bergh, 1999). However only after the outbreak of Rinderpest in 1897 in the area did farmers settle into the again (Du Preez, 2012). <i>No LIA sites are known from the immediate vicinity of the footprint area.</i></p>

3.3 Previous Archaeological and Heritage Studies in and around the Study Area

A scan of the SAHRIS database has revealed the following studies conducted in and around the study area of this report. These studies are summarised below in ascending date order:

Van der Walt, J. 2003. Phase 1 Archaeological Impact Assessment. A cultural heritage evaluation for the proposed service station in Acornhoek. Prepared for Bio8. Low density Iron Age ceramics of low heritage significance was found.

Küsel, U. S. 2007. Cultural heritage resources impact assessment of Portion 11 (a portion of portion 2) of the Farm Evert 5 Ju Hazyview Mpumalanga. Only one grave (Coenraad Vlietstra) was found in the project area.

Küsel, U. S. 2011. Cultural heritage resources impact assessment for two alternative power lines from the existing Mbumbu Traction Substation to the proposed Tsakani Substation that will run through the following farms: Burlington 217KU; Islington 219 KU; Edinburg 228 KU; Ludlow 227 KU; Eglington 225 KU, Mpumalanga Province. No cultural heritage resources or graves were identified.

Celliers, J, P. 2012b. Report on phase 1 archaeological impact assessment on Portions 2, 12 and 16 of the Farm Perry's Farm 9 JU and Portion 12 and the remainder of Portion 109 of the Farm De Rust 12 JU, Hazyview, Mpumalanga Province. Seven sites were documented and are rated with medium and low significance ratings. The sites consist of three areas where undecorated sherds of pottery were exposed, as well as sites consisting of old pump station structures, demolished dwellings and the remains of an irrigation canal.

Van Wyk Rowe, C. 2013. Phase 1 archaeological / heritage impact assessment for proposed Nkambeni Cemetery: Portion A (Portion of Portion 148) of the Farm Kaap Block Section F, Numbi Mpumalanga Province. No archaeological or historical structures of significance were found in the study area.

Celliers, J, P. 2014. Phase 1 Archaeological Survey on the farm Burlington 217 KU in Bushbuckridge Municipal area, Mpumalanga Province. Prepared for: For Enpact Environmental Consultants. Five graves were identified during the survey.

Küsel, U. S. 2014. A Phase I Cultural Heritage Resources Impact assessment for the proposed construction of a new 6.656km power line to supply Alexandria in the Bushbuckridge Area Mpumalanga Province. Prepared for: Eskom Distribution Northern Region. No cultural heritage resources or graves were identified.

Van der Walt, J. 2014. Archaeological Impact Assessment for the proposed aggregate gravel quarry on a portion of the farm Xanthia 253 and a portion of the farm Agincourt 254 KU, Bushbuckridge, Mpumalanga Province. Prepared for: Greenmined Environmental. No sites of heritage significance were found.

Roodt, F. 2017. A Letter of recommendation for the exemption of a full Phase 1 Heritage Impact Assessment (HIA) for the proposed Belfast Water Treatment Works, Bushbuckridge Municipality, Ehlanzeni District, Mpumalanga. Prepared for: Jacana Environmentals cc. No archaeological resources were identified.

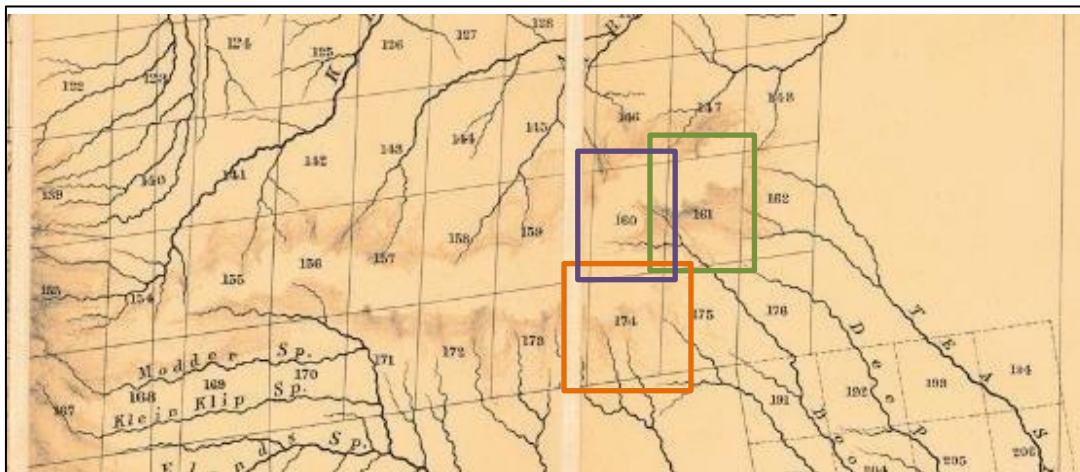
3.4 Historical Background of Farms Clare, Morgenzon and Welverdiend and the surrounding region

3.4.1 Farms Clare, Morgenzon and Welverdiend

According to the Map of Lydenburg Gold Fields (Loveday, 1883) the Farm Clare was owned by B. C. E. Proes (**Figure 28**). Bernard Cornelis Ernst Proes was born in the Netherlands. He came to South Africa in 1859 and was appointed as the first State Attorney of the South African Republic from 1831-1872 (Andrews & Ploeger, 1898). The Farm Welverdiend was owned by W. S. McLaren (Loveday, 1883). The Farm Morgenzon was owned by A. K. Murray.

3.4.2 Ohrigstad

Ohrigstad was established as a Boer settlement in 1845 (Delius, 2007). A. H. Potgieter and his Trekkers settled in the area after moving from Mooi River (Delius, 2007). They were later joined by a group led by J. J. Burgher (Delius, 2007). Ohrigstad was founded in 1845 by Hendrik Potgieter. He named the town after himself and George Ohrig: Andries-Ohrigstad. Due to conflict as a result of several deaths from the Malaria disease, Potgieter's group moved and settled in Schoemansdal (Delius, 2007). Those that stayed behind moved to Lydenburg where they established a new town (Delius, 2007). Ohrigstad was abandoned in 1848 (Theal, 1893; Packard, 2007). On the 14 May 1873, the area was however proclaimed as a public gold field after the discovery of gold in the Selati River (Jeppe, 1888).



INDEX.				
REF. NO.	NAME OF FARM	REG. NO.	NAME OF OWNER.	AREA IN ENGLISH ACRES AND REMARKS.
A				
5	Argyle ..	788	R. Stanford	
58	Artwerpen ..	760	W. Leathern	Encroached upon by O'Reilly's block (<i>vide</i> Inspection).
64	Addger ..	974	W. S. Sanders	6391-61 acres. Encroached upon by Roodewal (<i>vide</i> Inspection)
87	Alverton ..	888	A. R. Ash	
101	Antioch ..	368	O. W. A. Forssman	7958-59 acres.
105	Alderney ..	240	W. Smerdon	6391-61.
108	Avoca ..	498	H. G. Owen	6391-61.
147	Albatross ..	369	Maynard, Buchanan & Co. ..	6391-61.
148	Alma ..	453	J. D. Koek	6391-61.
156	Acornhoek ..	670	H. J. & J. H. Finnaughty ..	6391-61.
158	Audover ..	246	J. D. Barry and others ..	6391 61.
169	Arthur's Seat ..	183	P. J. Marais	7225-72.
188	Claremont ..	783	W. F. Lewis	
168	Craigie Burn ..	182	P. J. Marais	7282-15.
174	Clare ..	328	B. C. E. Proes	6391-61.
190	Casteel ..	300	P. J. Marais	5333-27.
212	Claremont ..	941	D. J. Joubert	
247	Congeonina ..	398	H. G. Owen	
291	Charleston ..	719	A. Brodrick	
318	Campbellshope	213	S. Marks	
340	Calcutta	Government	
341	Cork	Do.	
373	Ceylon ..	804	W. & R. Sanderson and others	
92	Morish ..	1092	M. M. Bruce	
122	Madrid ..	372	G. B. Rennie	7188-7.
124	Moria ..	495	C. Sonnenberg	7196-57.
160	Morgenzon ..	353	A. K. Murray	6391-61.
213	Mordena ..	826	J. Herschensonn	
214	Metz ..	221	I. Michaelson	
225	Marthly ..	357	A. C. Mather	
W				
10	Welgelegen ..	853	J. B. Shires	
77	Welverdiend ..	185	J. Ferguson and A. Goldschmidt and Co.	
106	Winchester ..	255	W. Smerden	6391-61.
126	Woodbastwick	243	Do.	6391-61.
151	Wakkeradal ..	22	W. F. Lewis	
161	Welverdiend ..	414	W. S. McLaren	6391-61.
182	Willemsoord ..	1034	W. Leathern and others ..	3813-213.
184	Welgevonden	364	P. J. Marais	8107-29.
185	Wales ..	365	Do.	6076-5.
235	Weltevreden ..	743	H. T. Buhrman and D. Ruiter	
244	Wales ..	726	D. and H. Oldknow	
256	Welgevonden	1332	C. J. Viljoen and others	

Figure 28 - Map dating to 1883 showing the Farms, Acornhoek, Clare and Welverdiend and their owners, in the Transvaal Province of the S.A. Republic (Source: Loveday, 1883)

3.4.3 *Pilgrims Rest*

In 1873 when gold was discovered on the farm Geelhoutboom near the town of Sabie (Smith, 2006). The Pilgrim's Rest Goldfield was proclaimed on 22nd September 1873 and led to the establishment of several towns in the region (Jeppe, 1888; Smith, 2006; Delius, 2007). Pilgrim's Rest, MacMac and Spitzkop became the new centres of the New Caledonia Goldfields (Jeppe, 1888).

Before 1899, a permanent railway line had been established along the Delagoa Bay railway line, while another ran north-west from Nelspruit to Pilgrim's Rest, and then to Kruger's Post and on to Lydenburg (Harris, 1998). All the mines in the Pilgrim's Rest area was connected to this Railway line system. During the Anglo-Boer War (1899-1902) Pilgrim's Rest and the surrounding areas stayed under the control of the Boers, although the mines were closed (Harris, 1998). During this time a Mint Commission was established in Pilgrim's Rest with Mr. Andries Gustav Erlank Pienaar appointed as Head (Landman-Reid, 2013). After the war mining continued. Most of the mines were owned by the Transvaal Gold Mining Estates, who later became part of Rand Mines (Schutte, 2009). The Pilgrim's Rest district was established on 1 May 1924 (Bergh, 1998). Pilgrim's Rest was declared a National Monument in 1986 as a living memory of the early gold rush days in South Africa during the late 1800's / early 1900's (Schutte, 2009).

3.4.4 *Hazyview*

The town of Hazyview is situated on the farm De Rust, which is located 35 km east of Sabie, 53 km west of Skukuza and 50km southwest of Hluvukani (Bornman, 2006). Because of its location and proximity to Sabie, Kruger National Park and Phalaborwa, it was the perfect locality for a trading post and petrol filling station (Bornman, 2006). Hazyview was officially promulgated in 1959 when the first post office was established and Hazyview Railway Station came into being when the old Selati Railway line was diverted outside the western border of the Kruger National Park to Kaapmuiden in the late 1960's (Bornman, 2006). The farm De Rust on which Hazyview is located was owned by Harry Wolhuter (Bornman, 2006). He later sold the farm to H. E. Gillman and Eric Smothers. Smothers donated a 5 morgen (1.25 ha) section of the farm for the establishment of the Sabi-Sand Co-operative in 1955 (Bornman, 2006). With the proclamation of the Kruger National Park in 1926, several nature reserves, for conservation purposes, were formed in and around the Hazyview area (Bornman, 2006).

3.4.5 *Conclusions*

The archival and historical research has revealed that area surrounding Pilgrim's Rest, Ohrigstad and Hazyview have a history of occupation and wildlife conservation.

3.5 **Archival/historical maps**

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

Topographic maps (1:50 000) for various years (1970 and 1986) were assessed to observe the development of the area, as well as the location of possible historical structures and burial grounds. The maps were also used to assess the possible age of structures located, to determine whether they could be considered as heritage sites. Map overlays were created showing the possible heritage sites identified within the areas of concern, as can be seen below (**Figure 29 - Figure 31**)

The relevant topographical maps include:

- Umbabat 2431 (No 15). Computed and compiled from the Farm Surveys of the Transvaal. Drawn in the Surveyor-Generals Office and photo-lithographed at the Government Printing Works in 1908.
- 2431CB Manyeleti, First Edition. Surveyed in 1970 and drawn in 1971 by the Trigonometrical Survey Office. Published by the Government Printer in 1971.
- 2431CB Manyeleti, Second Edition. Published by the Chief Director of Surveys and Mapping in 1986. Printed by the Government Printer.

It can be seen that all the map sheets consulted depict the entire project area surrounded by several huts, as well as old agricultural fields. Historical roads are also depicted.

Furthermore, from the Chief Surveyor General database (<http://csg.dla.gov.za/>) the farms Welverdiend, Clare and Morgenzon were surveyed (**Figure 32 - Figure 35**).

- Farm Welverdiend 206 KU
 - Portion 2 was surveyed on August 1897 by W. H. Gilfillan
- Clare 220 KU
 - Remainder of Portion 5 was surveyed from October to November 2005 by the Land Surveyor N. P. Shihundla.
 - Remainder of Portion 1 was surveyed from June to November 2006 by the Land Surveyors H. T. Ndhlovu and N. P. Shihundla.
- Morgenzon 199 KU
 - On August 1897 by W. H. Gilfillan

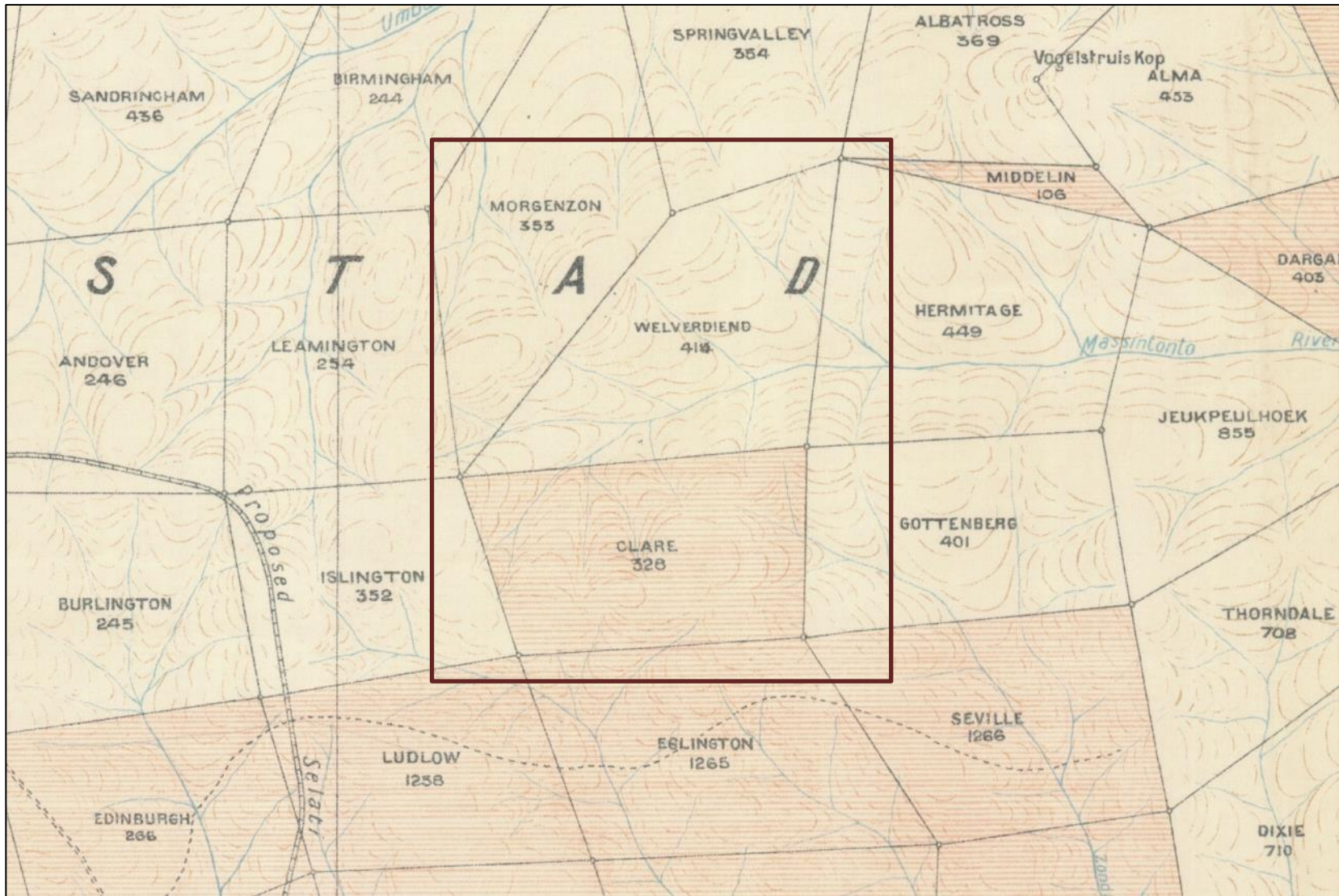


Figure 29 – Umbabat 2431 (No15) Topographic map.1908 showing the Farms Welverdiend 414, Morgenzon 353 and Clare 328

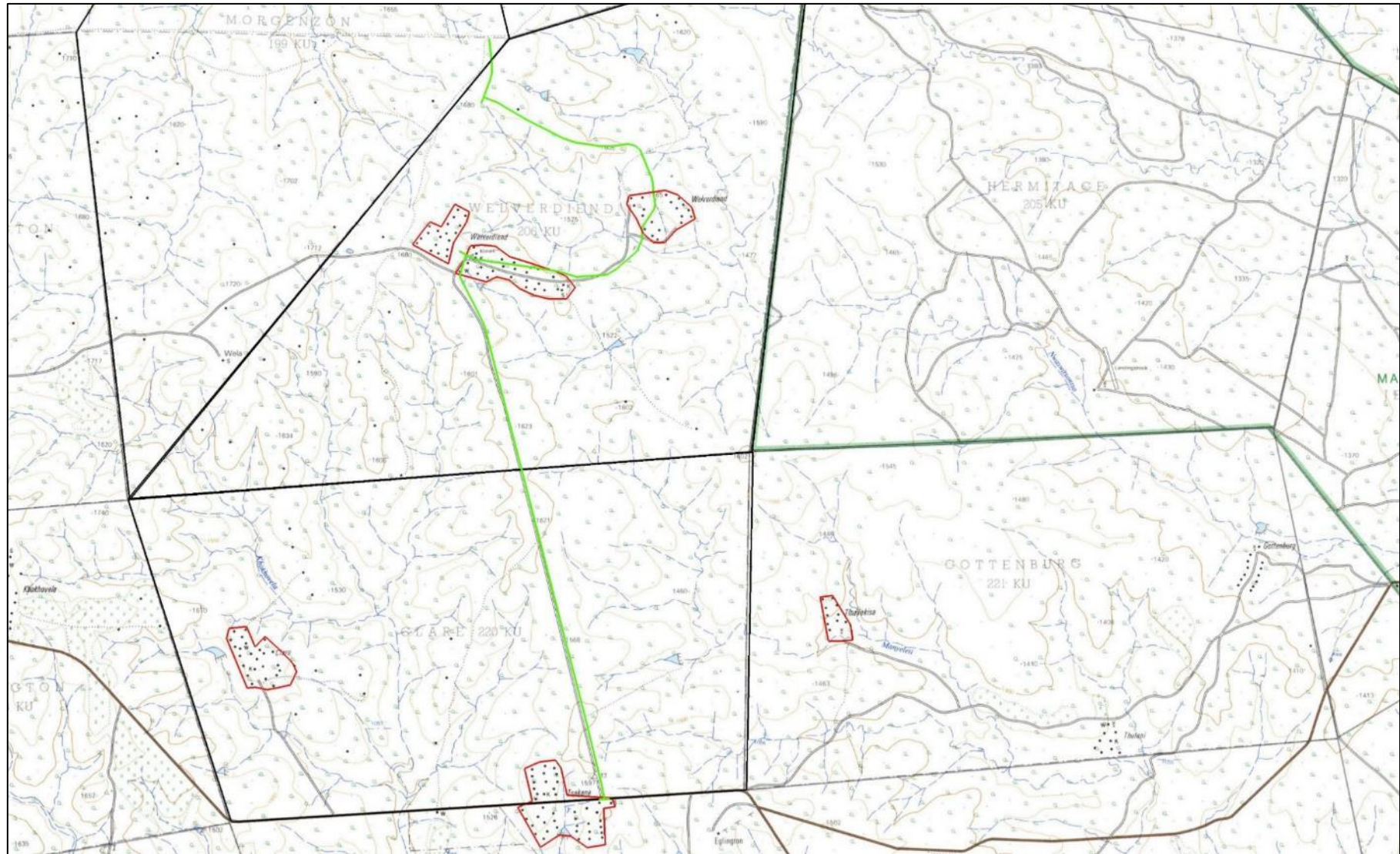


Figure 30 – 2431CB Manyeleti 1970, First Edition Topographic Map (1:50 000) with several heritage features (red polygons) located in close proximity to the project area (green polyline)

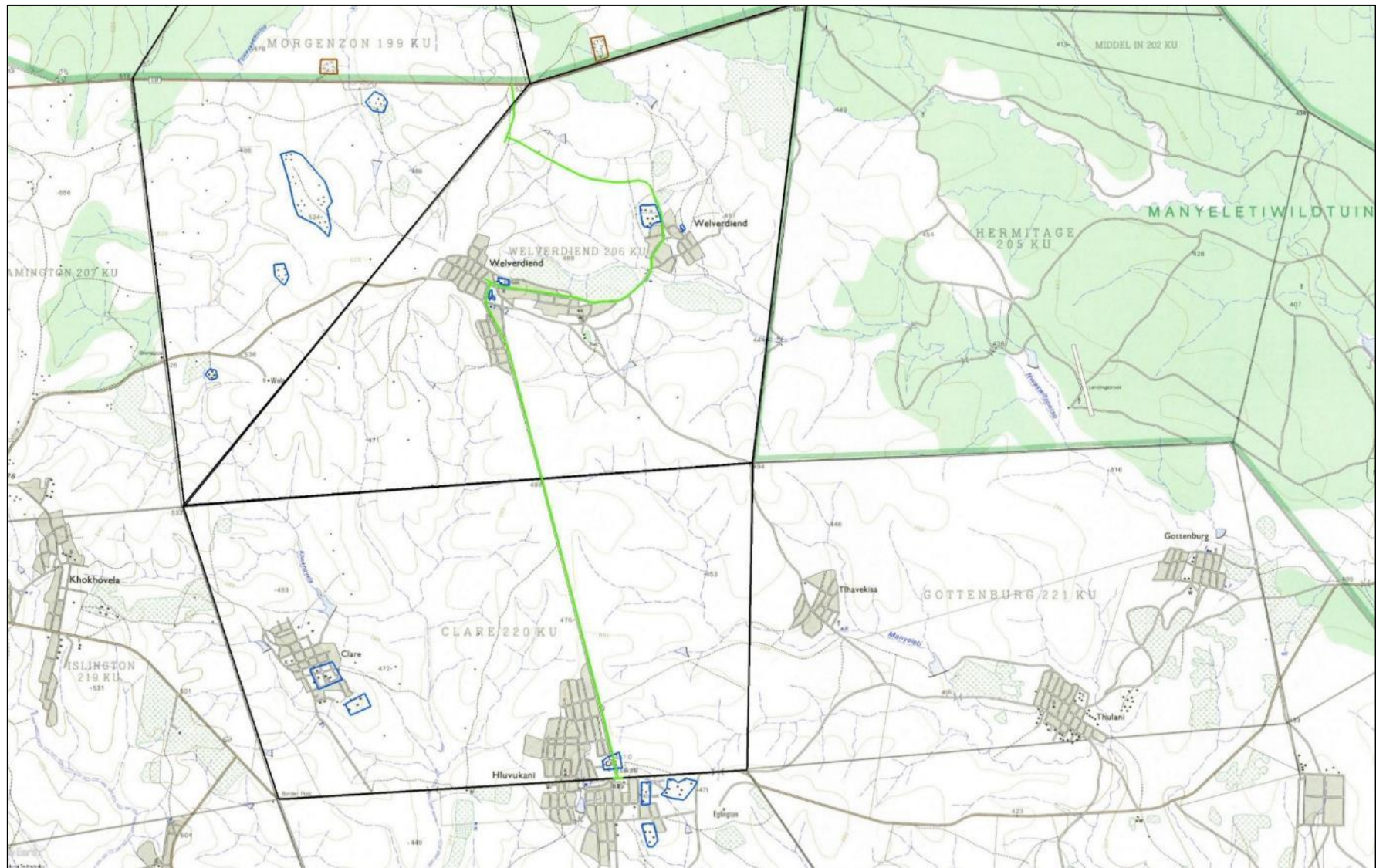
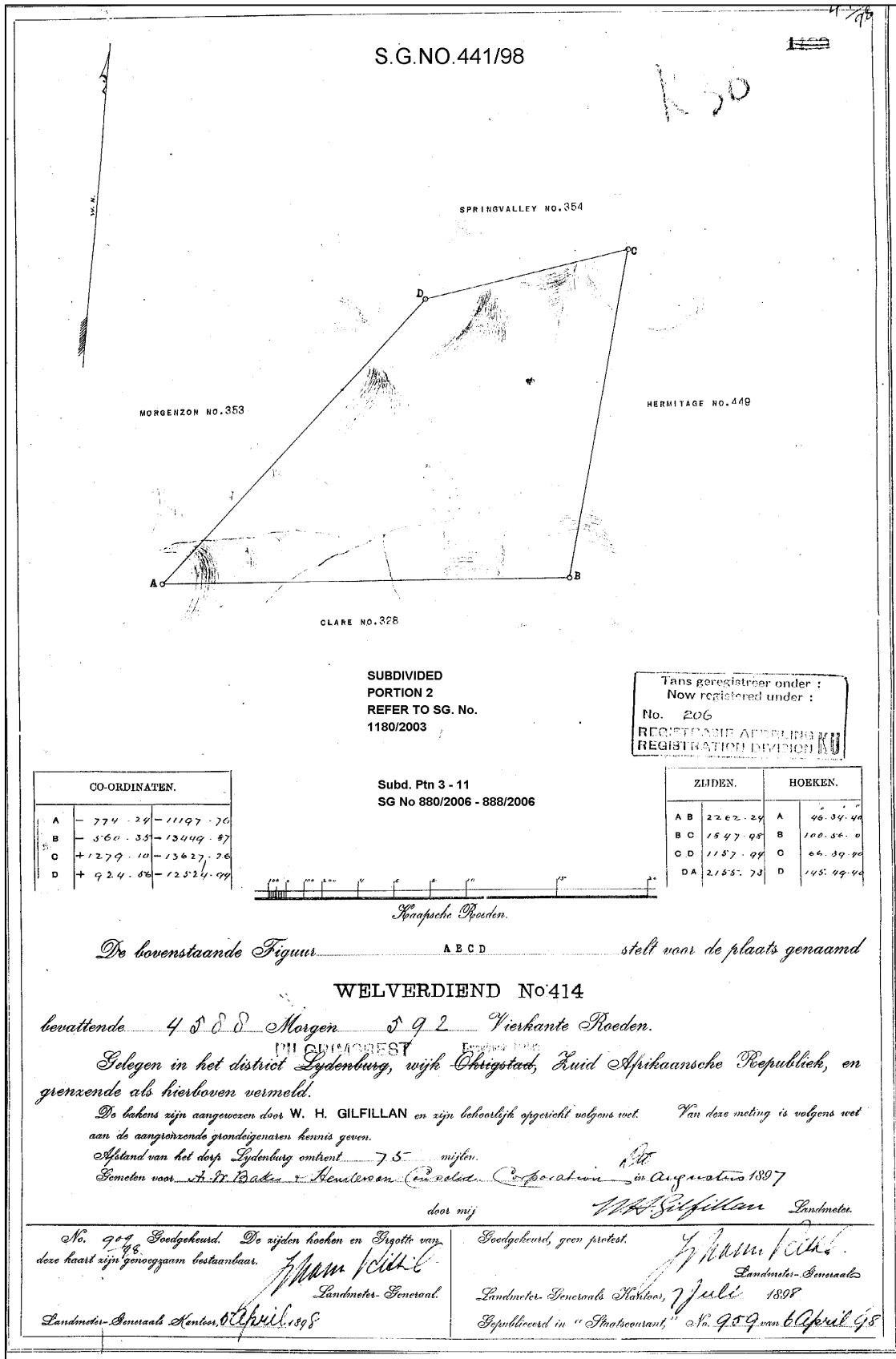



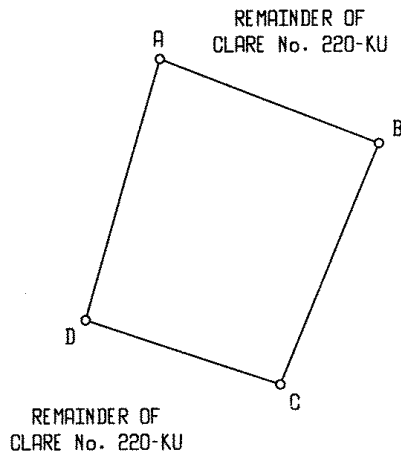
Figure 31 – 2431CB Manyeleti, 1986 Second Edition Topographic Map (1:50 000) with several heritage features (blue polygons) and mine dumps (brown polygon) located in close proximity to the project area (green polyline)



SUBDIVISIONAL DIAGRAM

OFFICE COPY


SIDES Metres		ANGLES OF DIRECTION		CO-ORDINATES Y System : WG 31° X		S.G. No.
		Constants:		0,00	+ 2 700 000,00	1002/2006
A B	10,12	291 23 20	A	- 30 105,78	+ 25 672,28	Approved  for SURVEYOR- GENERAL
B C	11,18	22 17 30	B	- 30 115,20	+ 25 675,97	
C D	8,87	108 20 10	C	- 30 110,96	+ 25 686,32	
D A	11,70	196 04 40	D	- 30 102,54	+ 25 683,53	
ISLINGTON		36	Δ	- 24 898,89	+ 23 868,42	2007-01-08 STATE LAND
MBUMBA		38	Δ	- 18 142,91	+ 30 348,56	
<u>BEACON DESCRIPTIONS</u>						
A,B,C,D16mm Iron Peg						



SCALE 1 / 250

The figure A B C D
represents 108 Square metres of land being
Portion 5
of the farm CLARE No. 220-KU

Mpumalanga Province
Surveyed in October to November 2005 by me


N.P. SHIHUNDLA (PLS-1077)
Professional Land Surveyor

This diagram is
annexed to
No.
d.d.
i.f.o.
Registrar of Deeds Pretoria

The original diagram is
S.G. No. 12466/1897
Transfer No. G2865/1869
Grant No.
DB 218/43

File KU-220
S.R. No. 273/2006
T.P.
Comp. KU-5

0186

Figure 33 – SG-Diagram from the Chief Surveyor General database for Remainder of Portion 5 Clare 220 KU which was surveyed from October to November 2005 by the Land Surveyor N. P. Shihundla.

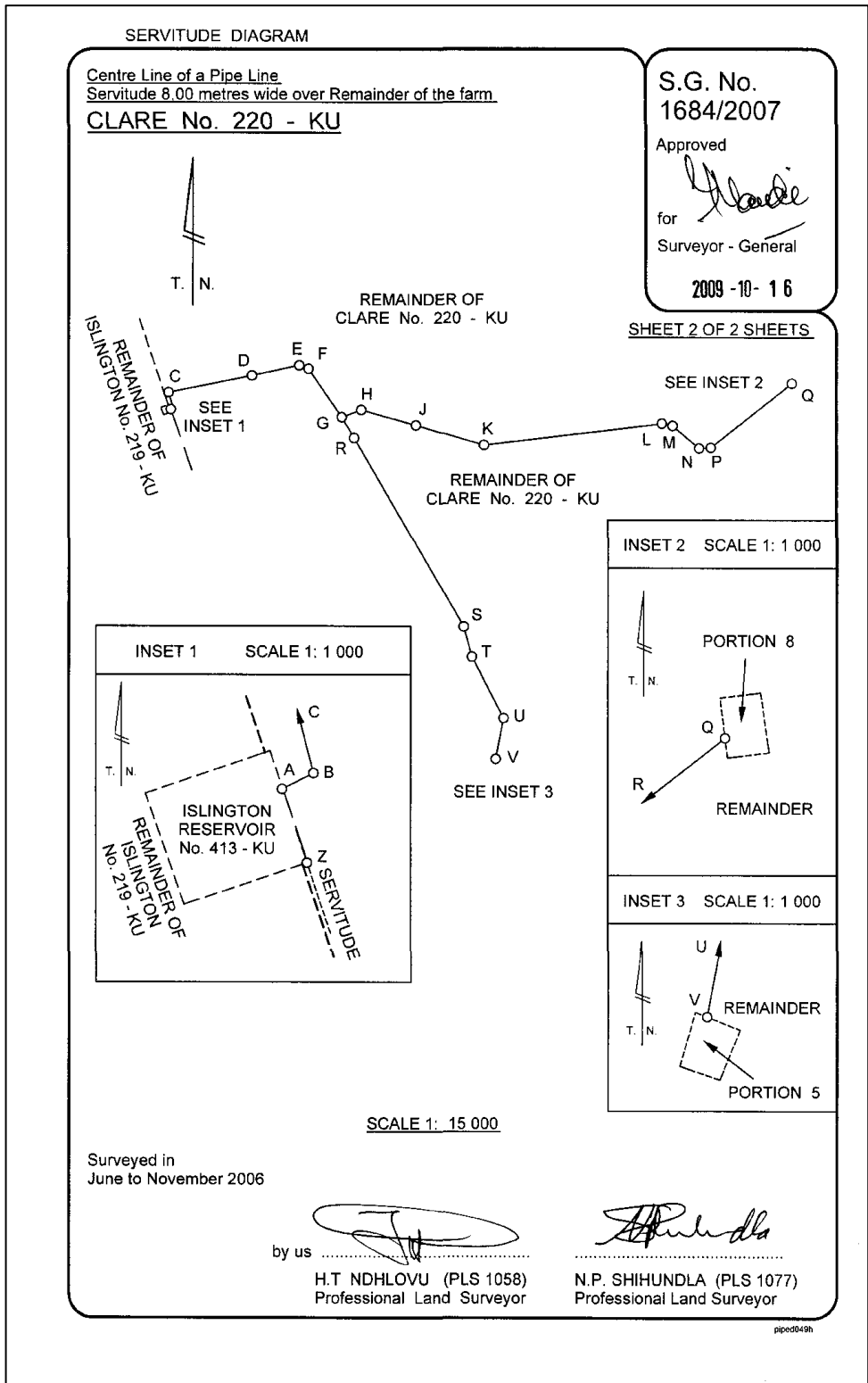


Figure 34 – SG-Diagram from the Chief Surveyor General database for of Remainder of Portion 1 of the Farm Clare 220 KU which was surveyed from June to November 2006 by the Land Surveyors H. T. Ndhlovu and N. P. Shihundla

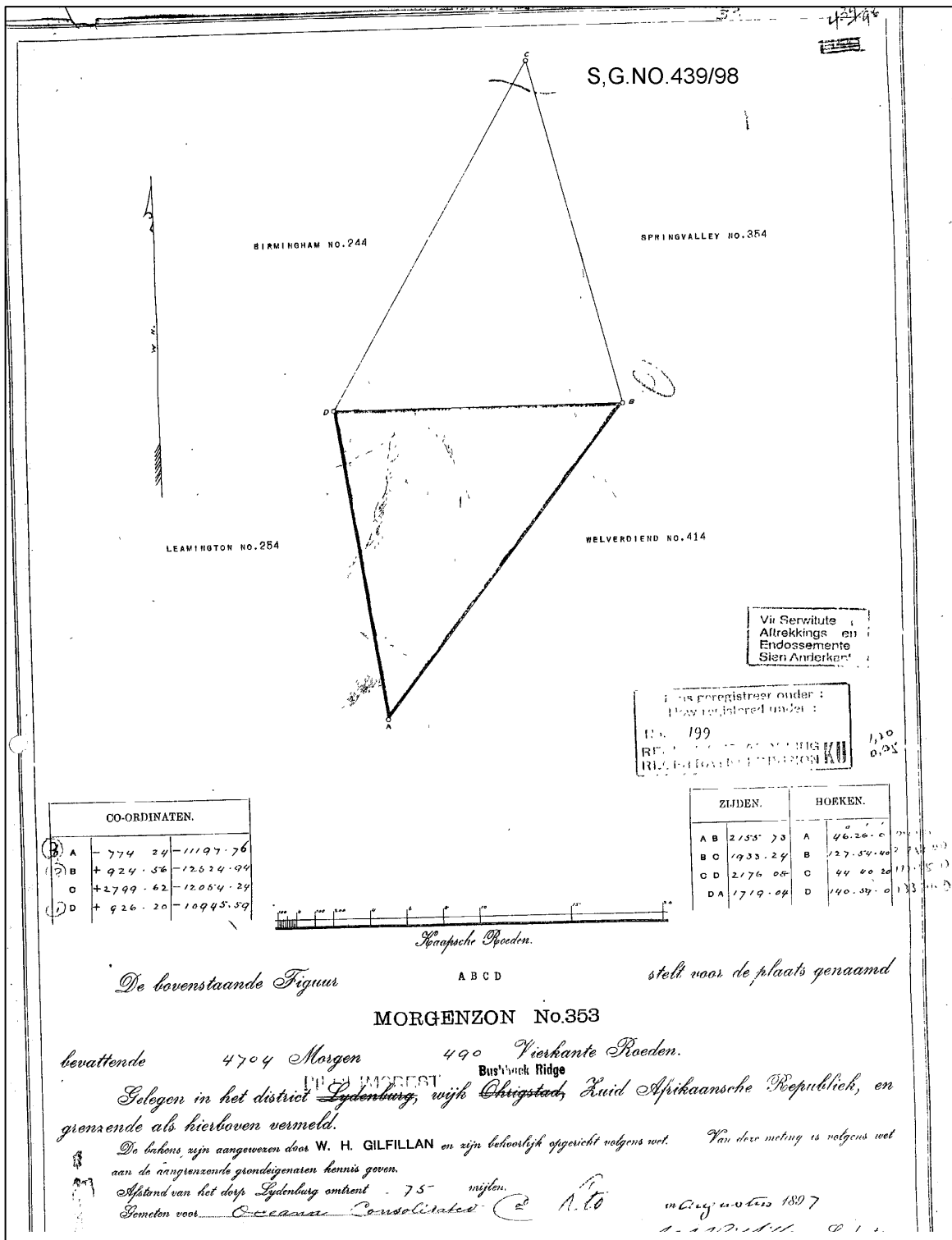


Figure 35 – SG-Diagram from the Chief Surveyor General database for the Farm Morgenzon 199 KU on August 1897 by W. H. Gilfillan

3.6 Findings of historical desktop study

The findings can be compiled as follows and have been combined to produce a heritage sensitivity map for the project based on the desktop assessment (**Figure 36**).

3.6.1 Heritage Sensitivity

The sensitivity maps were produced by overlying:

- Satellite Imagery;
- Current Topographical Maps; and
- First to second edition Topographical Maps dating from the 1908, and 1970's to 1986s.

This enabled the identification of possible heritage sensitive areas that included:

- Dwellings;
- Clusters of dwellings (homesteads, huts and farmsteads);
- Graves;
- Archaeological Sensitive areas; and
- Structures/Buildings.

By superimposition and analysis, it was possible to rate these structure/areas according to age and thus their level of protection under the NHRA. Note that these structures refer to possible tangible heritage sites as listed in **Table 5**.

Table 5 -Tangible heritage sites in the study area

Name	Description	Legislative protection
Archaeology - Iron Age Sites	Older than 100 years	NHRA Sect 3 and 35
Architectural Structures	Possibly older than 60 years	NHRA Sect 3 and 34
Graves and Burial Grounds	60 years or older	NHRA Sect 3 and 36

Additionally, evaluation of satellite imagery has indicated the following areas that may be sensitive from a heritage perspective. The analysis of the studies conducted in the area assisted in the development of the following landform type to heritage find matrix in **Table 6**.

Table 6 - Landform type to heritage find matrix

LANDFORM TYPE	HERITAGE TYPE
Crest and foot hill	LSA and MSA scatters, LIA settlements
Crest of small hills	Small LSA sites – scatters of stone artefacts, ostrich eggshell, pottery and beads
Watering holes/pans/rivers	LSA sites, LIA settlements
Farmsteads	Historical archaeological material
Ridges and drainage lines	LSA sites, LIA settlements
Forested areas	LIA sites

Upgrade of Roads between Hluvukani And Timbavati
Heritage Sensitivity Map

PGS Heritage (Pty) Ltd
Heritage Management Unit

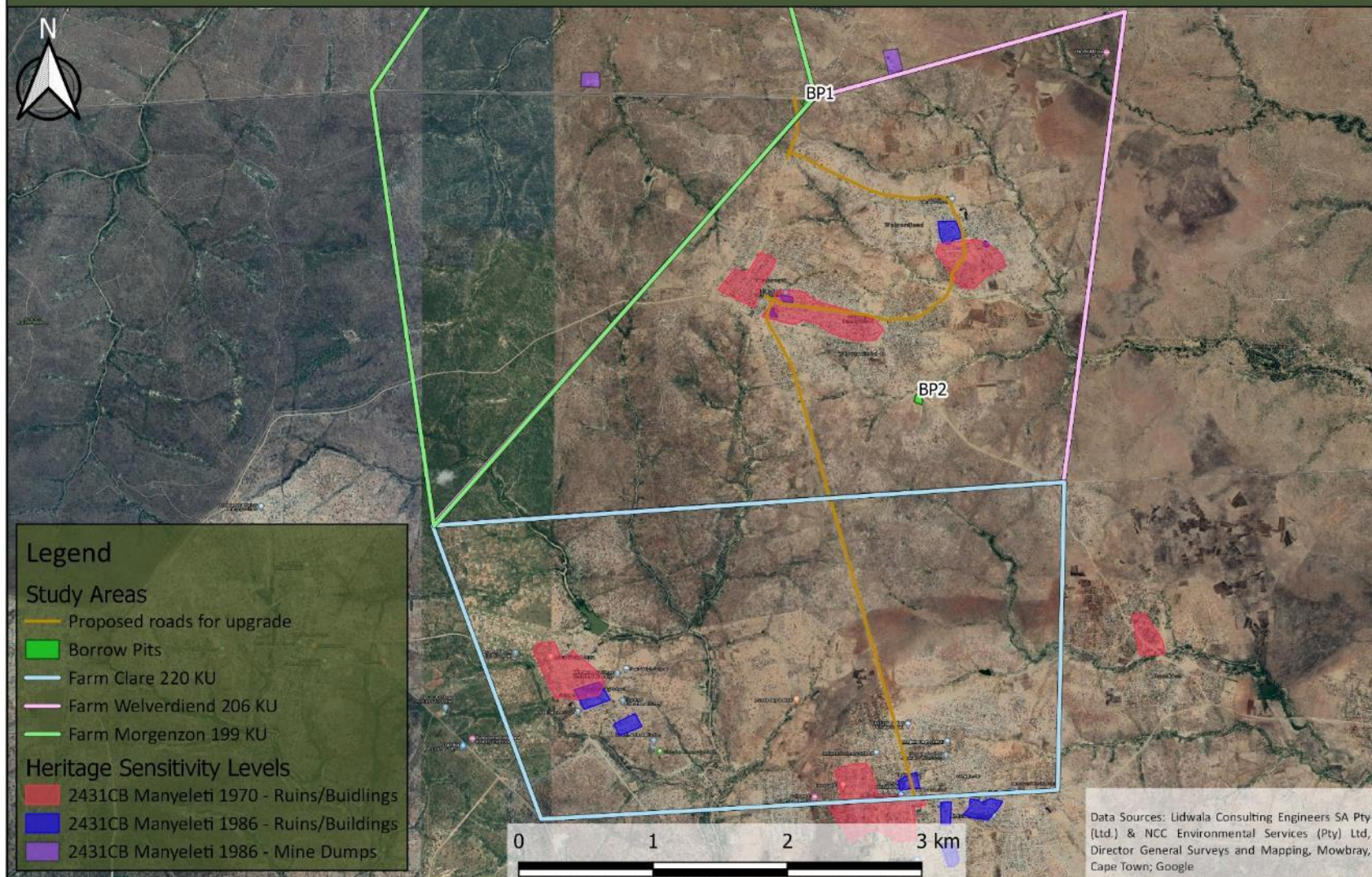


Figure 36 – Heritage sensitivity map indicating possible sensitive areas around and within the Farms Waverdiend 206 KU and Clare 220 KU – Overview map.

4 FIELDWORK AND FINDINGS

A controlled surface survey was conducted on foot and by vehicle over a period of three days by a heritage specialist from PGS and a student assistant. The fieldwork was conducted on 11 & 12 February 2020 and 26 February 2021. The track logs (in blue) for the survey are indicated in **Figure 37**.

The fieldwork identified 21 heritage features including Churches (**HR-01, HR-02**); Historical buildings and ruins (**HR-03 to HR-07**) and graves and informal burial grounds (**HR-08 to HR-21**).

Upgrade of Roads between Hluvukani And Timbavati Heritage Sites

PGS Heritage (Pty) Ltd
Heritage Management
Unit

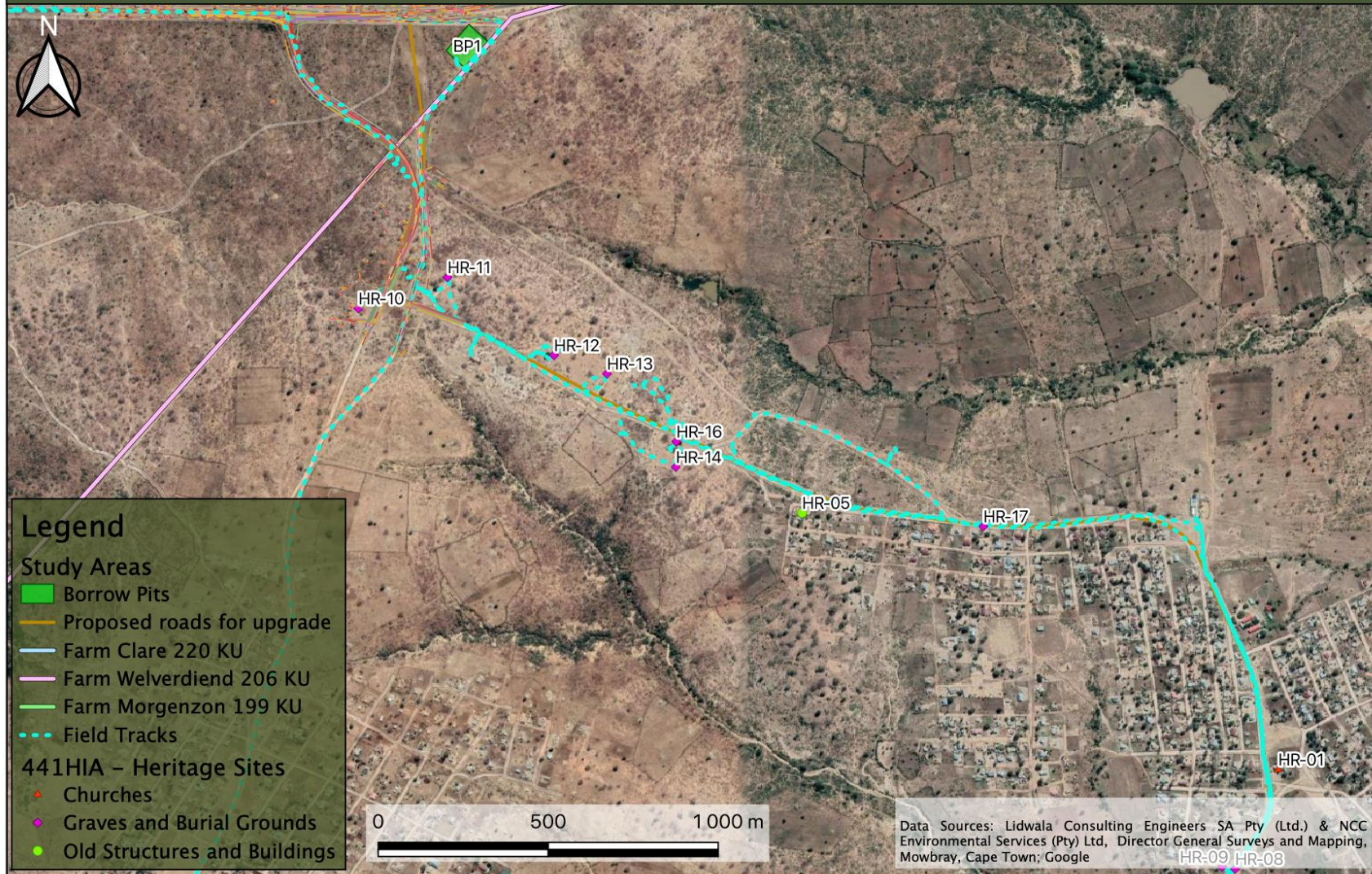


Figure 37 – Locality of the heritage resource in the northern section of the study area

Upgrade of Roads between Hluvukani And Timbavati

Heritage Sites

PGS Heritage (Pty) Ltd
Heritage Management
Unit

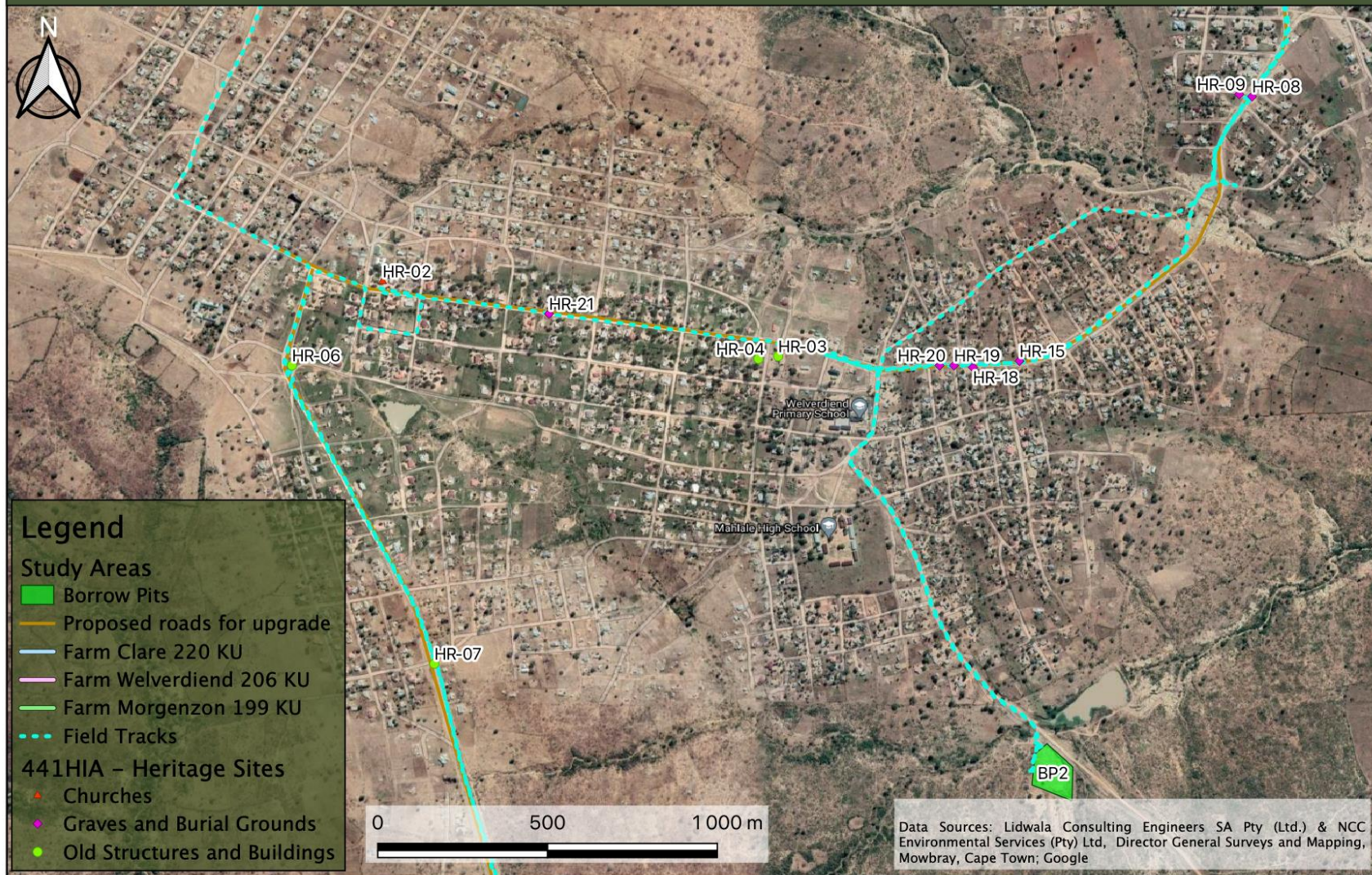


Figure 38 – Locality of the heritage resource in the southern section of the study area.

Table 7 - Sites identified during heritage survey

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-01	24°34'26.01"S	31°21'11.56"E	<p>A Church is located 20m east of road D4409 (Figure 39). The area Infront of the church has been disturbed by construction activities.</p> <p>Churches and places of cultural or religious significance to a community are protected under Section 3 of the National Heritage Resources Act, No. 25 of 1999. Thus, the site is provisionally rated as having a low heritage significance with a heritage rating of IIIC.</p> <p>It is recommended that the existing fence surrounding the church be used as a buffer between the construction and the church building. Construction vehicles should avoid entering the church property.</p>	Low	IIIC



Figure 39 – View of Church

¹ Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-02	24°34'53.07"S	31°19'44.63"E	<p>A Church is located 17m north of road D4409 (Figure 40). From the 2431CB Manyeleti 1970 Topographic map HR-02 is located in an area where a clinic used to be located (Figure 41). The church architecture is most likely from the 20th century.</p> <p>Churches and places of cultural or religious significance to a community are protected under Section 3 of the National Heritage Resources Act, No. 25 of 1999. Thus, the site is provisionally rated as having a low heritage significance with a heritage rating of IIIC.</p> <p>It is recommended that the existing fence surrounding the church be used as a buffer between the construction and the church building. Construction vehicles should avoid entering the church property.</p>	Low	IIIC



Figure 40 – View of Church

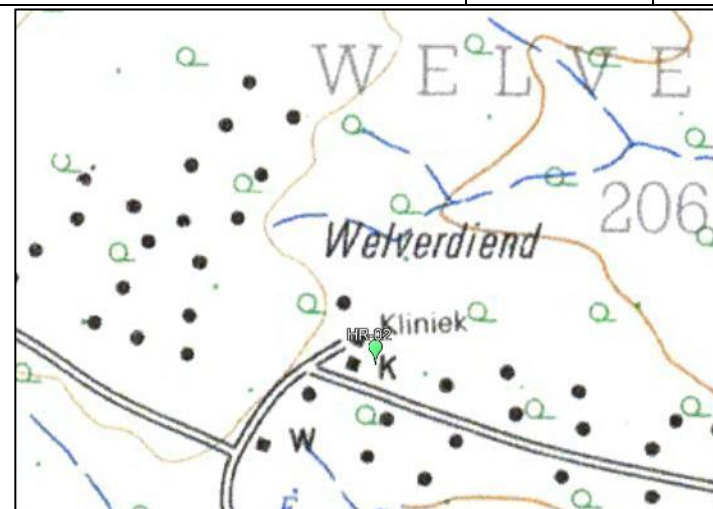


Figure 41 - HR-02 on the 1970 Topographic map

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-03	24°35'0.20"S	31°20'22.31"E	<p>An old historical type house dating to the 20th century was observed (Figure 42). The front part of the house appears to be a recent addition to the house as it contains tiled roof. The back section of the house does however appear to present with some of the original features of the house including a corrugated iron roof. The house is located 30m south of road D4409.</p> <p>Structures older than 60 years are generally protected under Section 34 of the NHRA 25 of 1999. However, the old historical house is not significant in terms of its vernacular and unique building materials. This is the result of alterations to the original structure and features. It is also not, as far as has been determined, associated with a unique group of people/individuals, or does it have a special relationship between the community and the surrounding environment. Thus, the site is provisionally rated as Not Conservation Worthy (NCW) as it has no research potential or of other cultural significance.</p> <p>It is recommended that the existing fence acts as a buffer between the road construction and the house. No further mitigation is required.</p>	NCW	No research potential or other cultural significance.



Figure 42 – View of HR-03 from the street

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-04	24°35'0.44"S	31°20'20.43"E	<p>An old historical type house dating to the 20th century with a red corrugated iron roof, and white painted walls was observed (Figure 43). The house is located 56m south of road D4409 and falls outside of the proposed project area.</p> <p>Structures older than 60 years are generally protected under Section 34 of the NHRA 25 of 1999. However, the old historical house is not significant in terms of its vernacular and building materials as a result of alterations to the original structure and features. As far has been determined, the house does not appear to have a significant relationship between the community and the surrounding environment. Thus, the site is provisionally rated as not conservation worthy (NCW) as it has no research potential or is it of other cultural significance.</p> <p>It is recommended that the existing fence acts as a buffer between the road construction and the house. No further mitigation is required.</p>	NCW	No research potential or other cultural significance.



Figure 43 – View of HR-04 from the street

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-05	24°34'1.60"S	31°20'26.26"E	<p>An old historical type house with a red corrugate iron roof was observed (Figure 44). The house is located 60m south of road D4409 and falls outside of the proposed project area.</p> <p>Structures older than 60 years are generally protected under Section 34 of the NHRA 25 of 1999. However, the old historical house is not significant in terms of its vernacular and unique building materials. This is the result of alterations to the original structure and features. As far has been determined, the house does not have a special relationship between the community and the surrounding environment. Thus, the site is provisionally rated as not conservation worthy (NCW) as it has no research potential or is it of other cultural significance.</p> <p>It is recommended that the existing fence acts as a buffer between the road construction and the house. No further mitigation is required.</p>	NCW	No research potential or other cultural significance.



Figure 44 – View of HR-05 from the street

Site ¹ number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-06	24°35'1.07"S	31°19'36.00"E	<p>The remains of old farm infrastructure (a cattle water feeder and possible foundations of a wind pump) was found next to the northern section of road D4407 close to culvert 16 (Figure 45). Although these farming structures are likely to be older than 60 years, and generally protected under Section 34 of the NHRA 25 of 1999, they do not represent any unique features that should be preserved. Thus, the site is provisionally rated as not conservation worthy (NCW) as it has no research potential or of other cultural significance.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • No mitigation is needed. 	NCW	No research potential or other cultural significance.



Figure 45 – Remains of old farming infrastructure

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-07	24°35'29.46"S	31°19'49.56"E	<p>The remains of what appears to be a concrete fountain was found next to the northern section of road D4407 between culvert 11 and 15 (Figure 46).</p> <p>The fountain is most likely contemporary and not of heritage significance. Thus, the site is provisionally rated as Not Conservation Worthy (NCW) as it has no research potential or of other cultural significance.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> No mitigation is needed. 	NCW	No research potential or other cultural significance.



Figure 46 – Remains of fountain

² Site in this context refers to a place where a heritage resource is located and not a proclaimed heritage site as contemplated under s27 of the NHRA.

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-08	24°34'35.47"S	31°21'7.45"E	<p>An unmarked grave was identified by the Welverdiend community during the construction activities of the proposed upgrade of road D4409 (Figure 47). The construction team demarcated the grave with a fence and danger tape. The potential impact on the grave is very high as the site falls directly within the proposed development area. The area in which the grave is located is heavily disturbed by the current construction activities.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> ▪ The site should be demarcated, and the grave should be avoided. ▪ Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-08 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under the NHRA and National Health Act regulations. 	High	IIIA



Figure 47 – Unmarked grave identified next to road

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-09	24°34'35.27"S	31°21'6.22"E	<p>A single grave was identified 30m west of road D4409 close to culvert 23 (Figure 48 - Figure 49). The grave contained a headstone with the following inscription:</p> <p><i>Moahloleng Senias</i> <i>DOB: 1906-07-31</i> <i>DOD: 1969-26-09</i> <i>Remembered by your family</i> <i>May your soul rest in Peace.</i></p> <p>Although it does fall directly within the proposed development area, the potential impact on the grave is very high. The area in which the grave is located is heavily disturbed by the current construction activities as well as an existing dirt road.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated, and the grave should be avoided. • Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-09 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under the NHRA and National Health Act regulations. 	High	IIIA

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
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Figure 48 –Grave identified close to road D4409



Figure 49 –Headstone of grave HR-09

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-10	24°33'42.15"S	31°19'44.04"E	<p>Several graves were identified 40m west of road D4416 (Figure 50 - Figure 51). A community member who was walking in the area mentioned that the graves belonged to the Mnisi family. This was also observed on some of the headstones. The informal cemetery is fenced off and contains approximately 12 visible graves.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA



Figure 50 – Fenced of graves identified at HR-10



Figure 51 – Headstones indicating that the graves belong to the Mnisi family

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-11	24°33'39.19"S	31°19'52.52"E	<p>Several graves were identified 100m north of road D4409 (Figure 52 - Figure 53). A community member pointed out that the graves belonged to the Masuku family. This was also observed on some of the headstones. The informal cemetery is fenced off and contains approximately 12 visible graves. A single unmarked grave was also identified next to the fenced off cemetery.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA



Figure 52 – Masuku family graves identified at HR-11



Figure 53 – Unmarked grave located outside of the Masuku family cemetery


Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-12	24°33'46.61"S	31°20'2.65"E	<p>Several graves were identified 50m north of road D4409. A community member pointed out that the graves belonged to the Chilouni family (Figure 54 - Figure 56 <i>Figure 55</i>). This was also observed on some of the headstones. The informal cemetery is fenced off and contains approximately 14 visible graves. A single marked grave, belonging to Valoi Perena, was also identified next to the fenced off cemetery. This grave does not belong to a Chilouni family but was buried here since the individual did not have any other family in the town Welverdiend (Personal comment from community member).</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA





Figure 54 – Chilouni family graves identified at HR-12



Figure 55 – Single fenced off grave next Chilouni family graves

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
HR-13	24°33'48.36"S	31°20'7.69"E	<p>A fenced of area containing unknown graves was identified 80m north of road D4409 (Figure 57 - Figure 58). Only 1 visible grave, containing cement dressing, was observed in the informal cemetery. It is possible that the area contains more graves but due to lack of visibility as a result of grassy vegetation and limited access (a lock was placed on the gate), more graves could not be identified.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
					
HR-14	24°33'57.24"S	31°20'14.24"E	 <p>Three graves were identified 80m south-west of road D4409 (Figure 59 - Figure 61). The graves were not fenced off and located in an open area. The site contained two unmarked graves covered in sand and packed stones, and a grave containing a granite headstone and dressing. From the inscription of the headstone it was determined that the graves belong to the Thete family.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
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Figure 59 – Graves identified at HR-14

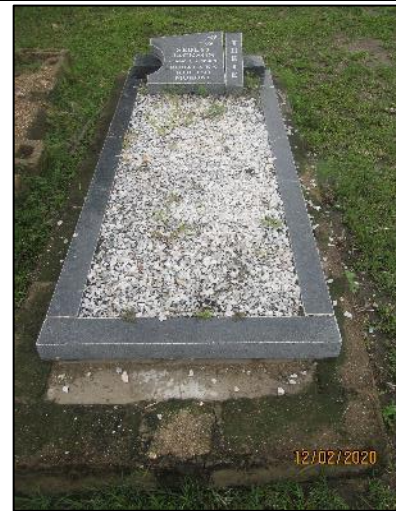





Figure 60 – One of the graves contained a headstone



Figure 61 – Inscription on headstone

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-15	24°35'0.65"S	31°20'45.29"E	<p>Two graves with brick dressing were identified 5m north from road D4409 (Figure 62). The graves are located at the junction between the D4409 and an unnamed dirt road. The graves do not fall directly within the proposed development area, they do however fall within the zone of influence for the construction activities. Thus, the potential impact on the grave is very high. The area in which the grave is located is heavily disturbed by the current construction activities as well as an existing dirt road.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated, and the grave should be avoided. • Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-15 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under the NHRA and National Health Act regulations. 	High	IIIA
					
<p>Figure 62 – Two graves identified at HR-15</p>					

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-16	24°33'54.82"S	31°20'14.29"E	<p>During the construction activities for road D4409 a family identified the location of an infant grave next to the road by an American Aloe (Agave Americana) plant (Figure 63-Figure 64). The construction team demarcated the American Aloe plant with a fence and danger tape. However, during consultation with the family and the construction team the family confirmed that the location of the grave is not at American Aloe plant but a few meters south of the plant (Appendix C). Because the grave is not marked the family could not remember the exact location but pointed out a general area surrounding a tree next to the road. During the survey no formal grave markers in the area was identified.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The site should be demarcated with a 10m buffer and the graves should be avoided. • The site should be treated as a No-Go-Area. 	High	IIIA
					
			<p><i>Figure 63 – Demarcated American Aloe plant</i></p>	<p><i>Figure 64 – Area pointed out by family were an infant grave is located</i></p>	

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-17	24°34'2.88"S	31°20'43.50"E	<p>A single grave was identified in the property of a community member in Welverdiend next to the D4409 road, close to culvert 26 (Figure 65). The grave is located within the property and is fenced.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The graves should be avoided. • The fence of the property will act as a buffer • The site should be treated as a No-Go-Area. 	High	IIIA



Figure 65 – Grave located in property at HR-17

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-18	24°35'1.26"S	31°20'40.86"E	<p>Two graves were identified in the property of a community member in Welverdiend next to the D4409 road, close to culvert 21 (Figure 66). The graves contain granite headstones and dressing and is located within the property and is fenced.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The graves should be avoided. • The fence of the property will act as a buffer • The site should be treated as a No-Go-Area. 	High	IIIA




Figure 66 – Graves located in property at HR-18

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-19	24°35'1.08"S	31°20'39.06"E	<p>A grave was identified in the property of a community member in Welverdiend next to the D4409 road, close to culvert 21 (Figure 67). The grave is located within the property and is fenced.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The graves should be avoided. • The fence of the property will act as a buffer • The site should be treated as a No-Go-Area. 	High	IIIA



Figure 67 – Grave located in property at HR-19

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
HR-20	24°35'1.08"S	31°20'37.68"E	<p>Two graves were identified in the property of a community member in Welverdiend next to the D4409 road, between culvert 20 and culvert 21 (Figure 68). The graves contain granite headstones and is located within the property and is fenced.</p> <p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The graves should be avoided. • The fence of the property will act as a buffer • The site should be treated as a No-Go-Area. 	High	IIIA
					
<p>Figure 68 – Graves located in property at HR-20</p>					
HR-21	24°34'56.16"S	31°20'0.48"E	<p>Two graves were identified in the property of a community member in Welverdiend next to the D4409 road, close to culvert 18 (Figure 69). The graves is located within the property and is fenced.</p>	High	IIIA

Site ² number	Lat	Lon	Description	Heritage Significance	Heritage Rating
			<p>Burial grounds and graves are protected under Section 36 of the NHRA 25 of 1999. Thus, the site is provisionally rated as having a high heritage significance with a heritage rating of IIIA.</p> <p>It is recommended that:</p> <ul style="list-style-type: none"> • The graves should be avoided. • The fence of the property will act as a buffer • The site should be treated as a No-Go-Area. 		



Figure 69 – Graves located in property at HR-21

4.1 Sensitivity assessment outcome

From the desktop assessment high to low heritage sensitive areas were identified along the northern section of the project area near Welverdiend as well as along the southern section near Hluvukani. Many of the heritage sensitive areas identified during the desktop search consisted of old structures and buildings that have either been destroyed or been altered by their current occupants.

A total of 21 sites were identified within the study area from and field survey. Of these sites five sites (**HR-03 to HR-07**) were rated as not conservation worthy and of no heritage significance. Two sites (**HR-01 and HR-02**) have a low heritage significance and heritage rating of IIIC. As such these sites can be considered to have a low-medium heritage sensitivity. The remaining 14 sites (**HR-08 to HR-21**) have a high heritage significance and heritage rating of IIIA. These sites have a high heritage sensitivity.

5 PALAEOLOGY

As can be seen in **Figure 70**, the proposed area of the project footprint occurs in an area where the palaeontology is assessed as being entirely of Insignificant/Zero (grey) sensitivity. As such no paleontological studies are required.

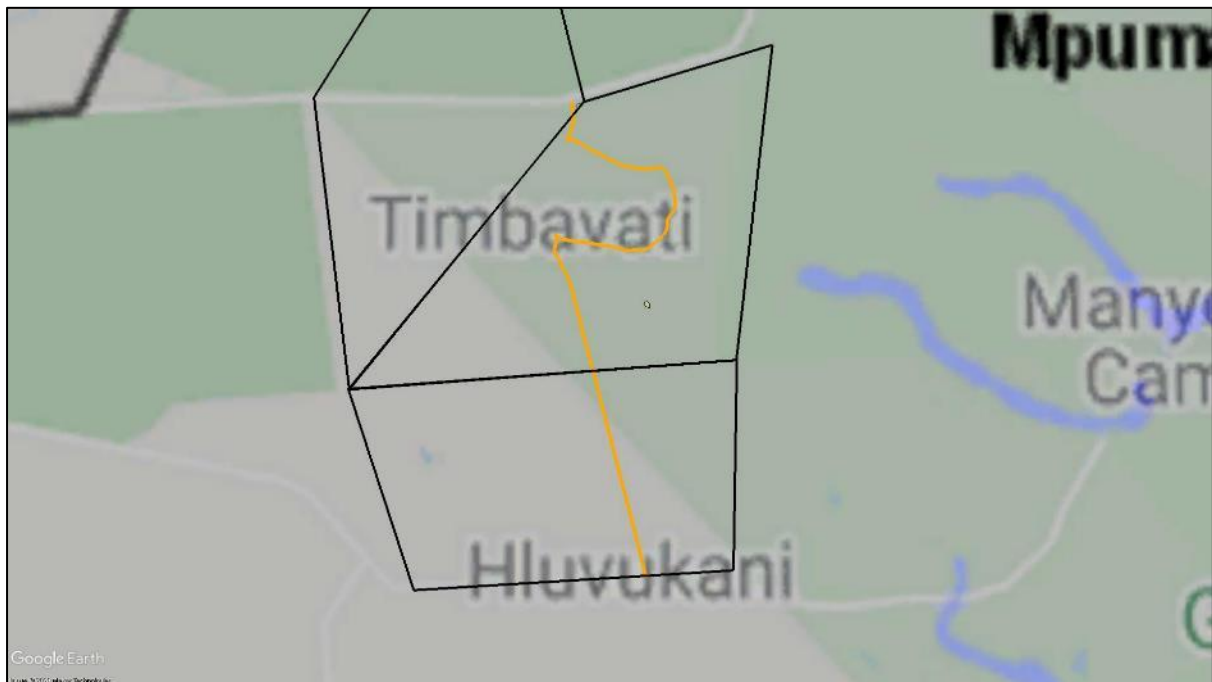


Figure 70 – Overlay of the Hluvukani Road Upgrade project area on the palaeo-sensitivity map from the SAHRIS database. This shows that most of the area is coloured grey which is rated as Insignificant sensitivity

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 71 - SAHRIS palaeosensitivity ratings table

6 IMPACT ASSESSMENT

The impact significance rating process serves two purposes: firstly, it helps to highlight the critical impacts requiring consideration in the management and approval process; secondly, it shows the primary impact characteristics, as defined above, used to evaluate impact significance.

The impacts will be ranked according to the methodology described below. Where possible, mitigation measures will be provided to manage impacts. In order to ensure uniformity, a standard impact assessment methodology will be utilised so that a wide range of impacts can be compared with each other. 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 summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in **Table 8**.

Table 8 - Quantitative rating and equivalent descriptors for the impact assessment criteria

RATING	SIGNIFICANCE	EXTENT SCALE	TEMPORAL SCALE
1	VERY LOW	Proposed site	Incidental
2	LOW	Study area	Short-term
3	MODERATE	Local	Medium/High-term
4	HIGH	Regional / Provincial	Long-term
5	VERY HIGH	Global / National	Permanent

A more detailed description of each of the assessment criteria is given in the following sections.

6.1 Significance Assessment

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, the magnitude (i.e. the size) of area affected by atmospheric pollution may be extremely large (1 000 km²) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration is great, the significance of the impact would be HIGH or VERY HIGH, but if it is diluted it would be VERY LOW or LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type were known. The impact would be VERY LOW if the grassland type was common. A more detailed description of the impact significance rating scale is given in **Table 9** below.

Table 9 - 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 are 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.

6.2 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 10**.

Table 10 - Description of the 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 impacts possible and will be felt at a regional scale (District Municipality to Provincial Level).
3	Local	The impact will affect an area up to 10 km from the proposed site.
2	Study Site	The impact will affect an area not exceeding the Eskom property.
1	Proposed site	The impact will affect an area no bigger than the ash disposal site.

6.3 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 scale is rated according to criteria set out in

Table 11.

Table 11 - 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/High term	The environmental impact identified will operate for the duration of life of facility.
4	Long term	The environmental impact identified will operate beyond the life of operation.
5	Permanent	The environmental impact will be permanent.

6.4 Degree of Probability

Probability or likelihood of an impact occurring will be described as shown in

Table 12 below.

Table 12 - 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

6.5 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 13**. The level of detail for specialist studies is determined according to the degree of certainty required for decision-making. The impacts are discussed in terms of affected parties or environmental components.

Table 13 - 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.
Don't know	The consultant cannot, or is unwilling, to make an assessment given available information.

6.6 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:

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

An example of how this rating scale is applied is shown in **Table 14**.

Table 14 - Example of Rating Scale

Impact	Significance	Spatial Scale	Temporal Scale	Probability	Rating
	LOW	Local	Medium/High-term	Could Happen	
Impact to air	2	3	3	3	1.6

Note: The significance, spatial and temporal scales are added to give a total of 8, that is divided by 3 to give a criteria 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 15** below.

Table 15 - 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 air quality above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a low impact. .

6.7 Heritage Impacts

The fieldwork identified 21 heritage features including Churches (**HR-01, HR-02**); Historical buildings and ruins (**HR-03 to HR-07**) and graves and informal burial grounds (**HR-08 to HR-21**).

6.7.1 Historical structures

HR-01 and **HR-02** (Churches) have a low heritage significance with a heritage grading of IIIC.

The impact significance before mitigation on the Churches will be LOW negative before mitigation. *Only the study site will be affected by the proposed development. **The possibility of the impact occurring is probable.*** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-03 to HR-05 (historical houses) it is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on the Farmhouse will be LOW negative before mitigation. *Only the study site will be affected by the proposed development. **The possibility of the impact occurring is probable.*** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-06 (old farm Infrastructure) and **HR-07** (concrete fountain) is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on **HR-06** will be MODERATE negative before mitigation, while the impact significance before mitigation on **HR-07** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development. **The possibility of the impact occurring is very likely.*** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

6.7.1 Burial Grounds and graves

HR-08 to HR-21 have a high heritage rating and a heritage grading of IIIA.

The impact significance before mitigation on **HR-08** and **HR-09** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development. **The possibility of the impact has already occurred.*** The expected duration of the impact is assessed as potentially

permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-10 to HR-14** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

The impact significance before mitigation on **HR-15** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact has already occurred.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-16** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-17 to HR-21** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended.

6.8 Palaeontological Impacts

The proposed area of the project footprint occurs in an area where the palaeontology is assessed as being entirely of Insignificant/Zero sensitivity. As such no paleontological studies are required.

6.9 Impact Assessment Table

Table 16 - Impact Assessment Table (pre-mitigation)

IMPACT	IMPACT DIRECTION	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Negative	LOW	Study Area	Permanent	Could happen	
Impact on HR-01 (Church)	-	2	2	5	3	1,80
	Negative	LOW	Study Area	Permanent	Could happen	
Impact on HR-02 (Church)	-	2	2	5	3	1,80
	Negative	VERY LOW	Study Area	Permanent	Could happen	
Impact on HR-03 (Historical House)	-	1	2	5	3	1,60
	Negative	VERY LOW	Study Area	Permanent	Could happen	
Impact on HR-04 (Historical House)	-	1	2	5	3	1,60
	Negative	VERY LOW	Study Area	Permanent	Could happen	
Impact on HR-05 (Historical House)	-	1	2	5	3	1,60
	Negative	VERY LOW	Study Area	Permanent	Very Likely	
Impact on HR-06 (old farm Infrastructure)	-	1	2	5	4	2,13
	Negative	VERY LOW	Study Area	Permanent	Could happen	
Impact on HR-07 (concrete fountain)	-	1	2	5	3	1,60
	Negative	HIGH	Study Area	Permanent	It's going to happen / has occurred	
Impact on HR-08 (Grave)	-	4	2	5	5	3,67
	Negative	HIGH	Study Area	Permanent	It's going to happen / has occurred	
Impact on HR-09 (Grave)	-	4	2	5	5	3,67
	Negative	HIGH	Study Area	Permanent	Could happen	
Impact on HR-10 (Mnisi Family Graves)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	Could happen	

IMPACT	IMPACT DIRECTION	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
Impact on HR-11 (Masuku Family Graves)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	Could happen	
Impact on HR-12 (Chilouni Family Graves)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	Could happen	
Impact on HR-13 (Graves)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	Could happen	
Impact on HR-14 (Graves)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	It's going to happen / has occurred	
Impact on HR-15 (Graves)	-	4	2	5	5	3,67
	Negative	HIGH	Study Area	Permanent	Could happen	
Impact on HR-16 (Infant Grave)	-	4	2	5	3	2,20
	Negative	HIGH	Study Area	Permanent	Unlikely	
Impact on HR-17 (Grave)	-	4	2	5	2	1,47
	Negative	HIGH	Study Area	Permanent	Unlikely	
Impact on HR-18 (Grave)	-	4	2	5	2	1,47
	Negative	HIGH	Study Area	Permanent	Unlikely	
Impact on HR-19 (Grave)	-	4	2	5	2	1,47
	Negative	HIGH	Study Area	Permanent	Unlikely	
Impact on HR-20 (Grave)	-	4	2	5	2	1,47
	Negative	HIGH	Study Area	Permanent	Unlikely	
Impact on HR-21 (Grave)	-	4	2	5	2	1,47

Table 17 - Impact Assessment Table (post-mitigation)

IMPACT	IMPACT DIRECTION	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Negative	LOW	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-01 (Church)	-	2	1	5	1	0,53
	Negative	LOW	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-02 (Church)	-	2	1	5	1	0,53
	Negative	NO IMPACT	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-03 (Historical House)	-	0	1	5	1	0,40
	Negative	NO IMPACT	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-04 (Historical House)	-	0	1	5	1	0,40
	Negative	NO IMPACT	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-05 (Historical House)	-	0	1	5	1	0,40
	Negative	VERY LOW	Isolated Sites / proposed site	Permanent	Could happen	
Impact on HR-06 (old farm Infrastructure)	-	1	1	5	3	1,40
	Negative	VERY LOW	Isolated Sites / proposed site	Permanent	Could happen	
Impact on HR-07 (concrete fountain)	-	1	1	5	3	1,40
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Unlikely	
Impact on HR-08 (Grave)	-	4	1	5	2	1,33
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Unlikely	
Impact on HR-09 (Grave)	-	4	1	5	2	1,33
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-10 (Mnisi Family Graves)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-11 (Masuku Family Graves)	-	4	1	5	1	0,67

IMPACT	IMPACT DIRECTION	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-12 (Chilouni Family Graves)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-13 (Graves)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-14 (Graves)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Unlikely	
Impact on HR-15 (Graves)	-	4	1	5	2	1,33
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Unlikely	
Impact on HR-16 (Infant Grave)	-	4	1	5	2	1,33
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-17 (Grave)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-18 (Grave)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-19 (Grave)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-20 (Grave)	-	4	1	5	1	0,67
	Negative	HIGH	Isolated Sites / proposed site	Permanent	Practically impossible	
Impact on HR-21 (Grave)	-	4	1	5	1	0,67

6.10 Management recommendations and guidelines

6.10.1 Construction phase

The project will encompass a range of activities during the construction phase, including ground clearance, establishment of construction camp areas and small-scale infrastructure development associated with the project.

It is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction and as such must be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, however foundation holes do offer a window into the past and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project and these must be catered for. Temporary infrastructure developments, such as construction camps and laydown areas, are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented.

6.10.2 Chance find procedure

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts.
- An appropriately qualified heritage practitioner / archaeologist must be identified to be called upon in the event that any possible heritage resources or artefacts are identified.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted.
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- The contractor therefore should have some sort of contingency plan so that operations could move elsewhere temporarily while the materials and data are recovered.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

6.10.3 Possible finds during construction and operation (mining activities)

The study area occurs within a greater historical and archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed reclamation activities, could uncover the following:

- stone foundations;
- ash middens associated with the historical structures that can contain bone, glass and clay ceramics, ash, metal objects such as spoons, forks, and knives.
- unmarked graves

6.11 Timeframes

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. **Table 18** gives guidelines for lead times on permitting.

Table 18 - Lead times for permitting and mobilisation

Action	Responsibility	Timeframe
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and SAHRA	3 months
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and SAHRA	2 weeks
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, SAHRA, local government and provincial government	6 months

6.12 Heritage Management Plan for EMPr implementation

Table 19 - Heritage Management Plan for EMPr implementation

Area and site no.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
General project area	Implement chance find procedures in case where possible heritage finds are uncovered	Construction and operation	During construction and operation	Applicant ECO Heritage Specialist	ECO (monthly / as or when required)	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-01	It is recommended that the existing fence surrounding the church be used as a buffer between the construction and the church building. Construction vehicles should avoid entering the church property.	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-02	It is recommended that the existing fence surrounding the church be used as a buffer between the construction and the church building. Construction vehicles should avoid entering the church property.	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-03	It is recommended that the existing fence acts as a buffer between the road construction and the house. No further mitigation is required.	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-04	It is recommended that the existing fence acts as a buffer between the road	Construction through to Operational	During Construction and Operation	Applicant	Applicant ECO	Ensure compliance with relevant legislation	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
	construction and the house. No further mitigation is required.			Environmental Control Officer (ECO) Heritage specialist		and recommendations from SAHRA under Section 36 and 38 of NHRA	
HR-05	It is recommended that the existing fence acts as a buffer between the road construction and the house. No further mitigation is required.	Construction through operation to	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-06	No mitigation required.	Construction through Operational to	During Construction and Operation	Applicant Environmental Control Officer (ECO)	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-07	No mitigation required.	Construction through operation to	Prior to and during construction	Applicant ECO	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-08	The site should be demarcated, and the grave should be avoided. Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-08 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under	Construction through Operational to	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
	the NHRA and National Health Act regulations.						
HR-09	<p>The site should be demarcated, and the grave should be avoided.</p> <p>Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-09 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under the NHRA and National Health Act regulations.</p>	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-10	<p>The site should be demarcated with a 10m buffer and the graves should be avoided.</p> <p>The site should be treated as a No-Go-Area.</p>	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-11	<p>The site should be demarcated with a 10m buffer and the graves should be avoided.</p> <p>The site should be treated as a No-Go-Area.</p>	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-12	<p>The site should be demarcated with a 10m buffer and the graves should be avoided.</p> <p>The site should be treated as a No-Go-Area.</p>	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
HR-13	The site should be demarcated with a 10m buffer and the graves should be avoided. The site should be treated as a No-Go-Area.	Construction through operation to	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-14	The site should be demarcated with a 10m buffer and the graves should be avoided. The site should be treated as a No-Go-Area.	Construction through Operational to	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-15	The site should be demarcated, and the grave should be avoided. Since the grave will be directly impacted the construction activities and future vehicle and foot traffic a grave relocation process for site HR-15 is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the SAHRA under the NHRA and National Health Act regulations.	Construction through operation to	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-16	The site should be demarcated with a 10m buffer and the graves should be avoided. The site should be treated as a No-Go-Area.	Construction through Operational to	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-17	The graves should be avoided.	Construction through operation to	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation	ECO Monthly Checklist/Report

Area and site no.	Mitigation measures	Phase	Timeframe	Responsible party for implementation	Monitoring Party (frequency)	Target	Performance indicators (monitoring tool)
	The fence of the property will act as a buffer The site should be treated as a No-Go-Area.					and recommendations from SAHRA under Section 36 and 38 of NHRA	
HR-18	The graves should be avoided. The fence of the property will act as a buffer The site should be treated as a No-Go-Area.	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-19	The graves should be avoided. The fence of the property will act as a buffer The site should be treated as a No-Go-Area.	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-20	The graves should be avoided. The fence of the property will act as a buffer The site should be treated as a No-Go-Area.	Construction through to Operational	During Construction and Operation	Applicant Environmental Control Officer (ECO) Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report
HR-21	The graves should be avoided. The fence of the property will act as a buffer The site should be treated as a No-Go-Area.	Construction through to operation	Prior to and during construction	Applicant ECO Heritage specialist	Applicant ECO	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 and 38 of NHRA	ECO Monthly Checklist/Report

7 CONCLUSIONS

The HIA has shown that the study area and surrounding area has some heritage resources situated within the proposed development boundaries. Through data analysis and a site investigation the following issues were identified from a heritage perspective.

Heritage Sites

7.1.1 *Heritage Sites in the vicinity of the Hluvukani Road project*

The fieldwork identified 21 heritage features including Churches (**HR-01, HR-02**); Historical buildings and ruins (**HR-03 to HR-07**) and graves and informal burial grounds (**HR-08 to HR-21**).

7.1.2 *Historical structures*

HR-01 and **HR-02** (Churches) have a low heritage significance with a heritage grading of IIIC.

The impact significance before mitigation on the Churches will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-03 to HR-05 (historical houses) it is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on the Farmhouse will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

HR-06 (old farm Infrastructure) and **HR-07** (concrete fountain) is not of heritage significance and thus not conservation worthy.

The impact significance before mitigation on **HR-06** will be MODERATE negative before mitigation, while the impact significance before mitigation on **HR-07** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is very likely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

7.1.3 Burial Grounds and graves

HR-08 to HR-21 have a high heritage rating and a heritage grading of IIIA.

The impact significance before mitigation on **HR-08** and **HR-09** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact has already occurred.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-10 to HR-14** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is probable.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable VERY LOW negative.

The impact significance before mitigation on **HR-15** will be HIGH negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact has already occurred.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-16** will be MODERATE negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended mitigation measures will modify this impact rating to an acceptable LOW negative.

The impact significance before mitigation on **HR-17 to HR-21** will be LOW negative before mitigation. *Only the study site will be affected by the proposed development.* **The possibility of the impact occurring is unlikely.** The expected duration of the impact is assessed as potentially permanent. Implementation of the recommended

7.2 Palaeontological Impacts

The proposed area of the project footprint occurs in an area where the palaeontology is assessed as being entirely of Insignificant/Zero sensitivity. As such no paleontological studies are required.

7.3 General

It is the author's considered opinion that overall impact on heritage resources is High to NCW. Provided that the recommended mitigation measures are implemented, the impact would be acceptably low or could be totally mitigated to the degree that the project could be approved from a

heritage perspective. The management and mitigation measures as described in Section 6 of this report have been developed to minimise the project impact on heritage resources.

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Heritage Assessment Methodology

The applicable maps, tables and figures, are included as stipulated in the NHRA (no 25 of 1999), the NEMA (no 107 of 1998). The HIA process consisted 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 by vehicle through the proposed project area by a qualified heritage specialist. The survey was conducted over one day (21 August 2019), 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 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:

Site Significance

Site significance classification standards use is based on the heritage classification of s3 in the NHRA and developed for implementation keeping in mind the grading system approved by SAHRA for archaeological impact assessments. The update classification and rating system as developed by Heritage Western Cape (2016) is implemented in this report

Site significance classification standards prescribed by the Heritage Western Cape Guideline (2016), were used for the purpose of this report (Error! Reference source not found. and Error! Reference source not found.).

Table A 1: Rating system for archaeological resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Langebaanweg (West Coast Fossil Park), Cradle of Humankind	May be declared as a National Heritage Site managed by SAHRA. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Highest Significance
II	Heritage resources with special qualities which make them significant, but do not fulfil the criteria for Grade I status. Current examples: Blombos, Paternoster Midden.	May be declared as a Provincial Heritage Site managed by HWC. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	Exceptionally High Significance
III	Heritage resources that contribute to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. Current examples: Varschedrift; Peers Cave; Brobartia Road Midden at Bettys Bay	Resource must be retained. Specific mitigation and scientific investigation can be permitted in certain circumstances with sufficient motivation.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree.	Resource must be retained where possible where not possible it must be fully investigated and/or mitigated.	Medium Significance
IIIC	Such a resource is of contributing significance.	Resource must be satisfactorily studied before impact. If the recording already done (such as in an HIA or permit application) is not sufficient, further recording or even mitigation may be required.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant or the consultant and approved by the authority.	No research potential or other cultural significance

Table A 2: Rating system for built environment resources

Grading	Description of Resource	Examples of Possible Management Strategies	Heritage Significance
I	Heritage resources with qualities so exceptional that they are of special national significance. Current examples: Robben Island	May be declared as a National Heritage Site managed by SAHRA.	Highest Significance
II	Heritage resources with special qualities which make them significant in the context of a province or region, but do not fulfil the criteria for Grade I status. Current examples: St George's Cathedral, Community House	May be declared as a Provincial Heritage Site managed by HWC.	Exceptionally High Significance
II	Such a resource contributes to the environmental quality or cultural significance of a larger area and fulfils one of the criteria set out in section 3(3) of the Act but that does not fulfil the criteria for Grade II status. Grade III sites may be formally protected by placement on the Heritage Register.		
IIIA	Such a resource must be an excellent example of its kind or must be sufficiently rare. These are heritage resources which are significant in the context of an area.	This grading is applied to buildings and sites that have sufficient intrinsic significance to be regarded as local heritage resources; and are significant enough to warrant that any alteration, both internal and external, is regulated. Such buildings and sites may be representative, being excellent examples of their kind, or may be rare. In either case, they should receive maximum protection at local level.	High Significance
IIIB	Such a resource might have similar significances to those of a Grade III A resource, but to a lesser degree. These are heritage resources which are significant in the context of a townscape, neighbourhood, settlement or community.	Like Grade IIIA buildings and sites, such buildings and sites may be representative, being excellent examples of their kind, or may be rare, but less so than Grade IIIA examples. They would receive less stringent protection than Grade IIIA buildings and sites at local level.	Medium Significance
IIIC	Such a resource is of contributing significance to the environs. These are heritage resources which are significant in the context of a streetscape or direct neighbourhood.	This grading is applied to buildings and/or sites whose significance is contextual, i.e. in large part due to its contribution to the character or significance of the environs. These buildings and sites should, as a consequence, only be regulated if the significance of the environs is sufficient to warrant protective measures, regardless of whether the site falls within a Conservation or Heritage Area. Internal alterations should not necessarily be regulated.	Low Significance
NCW	A resource that, after appropriate investigation, has been determined to not have enough heritage significance to be retained as part of the National Estate.	No further actions under the NHRA are required. This must be motivated by the applicant and approved by the authority. Section 34 can even be lifted by HWC for structures in this category if they are older than 60 years.	No research potential or other cultural significance

PROFESSIONAL CURRICULUM FOR CHERENE DE BRUYN

Name: Cherene de Bruyn
Profession: Archaeologist
Date of Birth: 1991-03-01
Parent Firm: PGS Heritage (Pty) Ltd
Position in Firm: Archaeologist
Years with Firm: 1 Month
Years' experience: 2
Nationality: South African
HDI Status: White Female

EDUCATION:

Name of University or Institution : University of Pretoria
Degree obtained: : BA
Major subjects : Archaeology and Anthropology
Year : 2010-2012

Name of University or Institution : University of Pretoria
Degree obtained : BA (Hons)
Major subjects : Archaeology
Year : 2013

Name of University or Institution : University of Pretoria
Degree obtained : BSc (Hons)
Major subjects : Physical Anthropology
Year : 2015

Name of University or Institution : University College London
Degree obtained : MA
Major subjects : Archaeology
Year : 2016/2017

Professional Qualifications:

Association of Southern African Professional Archaeologists - Professional Member (#432)

International Association for Impact Assessment South Africa - Member (#6082)

Association of Southern African Professional Archaeologists - CRM Accreditation

- Principle Investigator: Grave relocation
- Field Director: Colonial period archaeology, Iron Age archaeology
- Field Supervisor: Rock art, Stone Age archaeology
- Laboratory Specialist: Human Skeletal Remains

Languages:

Afrikaans

English

KEY QUALIFICATIONS

Heritage Impact Assessment Management, Historical and Archival Research, Archaeology, Physical Anthropology, Grave Relocations, Fieldwork and Project Management including *inter alia*

Summary of Experience

Involvement in various grave relocation projects and grave “rescue” excavations in the various provinces of South Africa

Involvement with various Heritage Impact Assessments, within South Africa

- Heritage Impact Assessments for various projects

HERITAGE ASSESSMENT PROJECTS

Below a selected list of Heritage Impact Assessments (HIA) Projects involvement:

- Heritage Impact Assessment for the proposed piggery on Portion 46 of the Farm Brakkefontien 416, within the Nelson Mandela Bay Municipality, Eastern Cape Province.
- Heritage Impact Assessment for the theProposed Rapid Land Release Programme for the Gauteng Department of Human Settlement: Rietfontein Site, Gauteng Province.
- Heritage Impact Assessment for the proposed Prospecting Right Application on the Farm Reserve No 4 15823 And 7638/1, near St Lucia, within the jurisdiction of the Mfolozi Local Municipality in the King Cetshwayo District Municipality, KwaZulu-Natal Province.
- Heritage Public Participation report for the proposed alterations Of Erf 1/966 Rosettenville or 94 Main Street Rosettenville within the City Of Johannesburg Metropolitan Municipality, Gauteng Province.
- Heritage Impact Assessment for the proposed mining rights on the Farm Waterkloof 95 located between Griekwastad and Groblershoop in the Pixley Ka Seme District Municipality within the Northern Cape Province.
- Heritage Impact Assessment for the proposed East Coast Gas 400 Kv Power Lines, located in Richards Bay, within the Umhlathuze Local Municipality in the King Cetshwayo District Municipality in the Kwazulu-Natal Province.
- Heritage Impact Assessment for the mining right application for the Farm Woodlands 407, situated in the Free State Province.
- Heritage Impact Assessment for the refurbishments of Lyttelton Primary School, Lyttelton Manor, Centurion, Gauteng Province.
- Heritage Impact Assessment for the amendment of an existing prospecting right and environmental authorization for Bothaville NE Ext A, situated in the Free State Province.
- Heritage Impact Assessment Study for the Proposed New Lambano Sub Acute Facility on Stand 5454, 5455, 5456,5457 and New Training Facility on Stands 5458 and 5460 in Kensington, Johannesburg.
- Heritage Impact Assessment for the Prospecting Right and Environmental Authorization Application for Ventersburg B situated in the Free State Province.
- Heritage Impact Assessment for the proposed prospecting rights application and environmental authorisation for the farm Three Sisters in Barberton, within the city of Mbombela Local District, Mpumalanga.

- Heritage Impact Assessment and Integrated Cultural Resources Management Study for The Proposed Mfolozi-Mbewu 765kv Transmission Line, Zululand And King Cetshwayo District Municipality, KwaZulu-Natal.
- Heritage Impact Assessment the prospecting right and environmental authorisation application for Kroonstad South situated in the Free State Province.
- Heritage Impact Assessment the prospecting right and environmental authorisation application for Vredefort West situated in the Free State Province.
- Archaeological impact assessment for a mining permit application for portion 19 of the farm Syferfontein 303 IP within the city of Matlosana Local Municipality in the North West Province.

GRAVE RELOCATION PROJECTS

Below, a selection of grave relocation projects involvement:

- Grave exhumation and relocation of 19 graves on erf 3 of Holding 87 North Riding Agricultural Holdings, City of Johannesburg, Gauteng Province.
- Report on the exhumation and reburial report of 16 graves from Doornkop, to Voortrekker Cemetery in Middelburg, Mpumalanga Province
- Exhumation and reburial report of 4 graves located at Tombo, Eastern Cape Province.
- Report on rescue excavations and skeletal analyses of two archaeological graves inadvertently uncovered in Boitekong, North-West Province.
- Rescue excavation of an unmarked graveyard at Diamond Park, Greenpoint, Kimberley, Northern Cape Province.
- Report on Follow-up site visit excavation and physical anthropological analyses of archaeological human remains transferred from SAPA Victim Identification Centre to Department of Anatomy. Mamelodi East Phase 2 House 566.
- Excavation of human remains from Marulaneng village, Bakenberg Limpopo Province.
- Follow up site visit on human remains found at Bothlokwa (Ramatjowe & Mphakahne), Limpopo Province.
- Follow up site visit on human remains found in Waterpoort, Soutpansberg, Limpopo Province.

EMPLOYMENT SUMMARY:

Positions Held

- 2020 – to date: Archaeologist - PGS Heritage (Pty) Ltd
- 2019: Manager of the NGT ESHS Heritage Department – NGT Holdings (Pty) Ltd
- 2018 – 2019: Archaeologist and Heritage Consultant – NGT Holdings (Pty) Ltd
- 2015-2016: Archaeological Contractor - BA3G, University of Pretoria
- 2014 – 2015: DST-NRF Archaeological Intern, Forensic Anthropological Research Centre

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

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 – Professional Grave Solutions (Pty) Ltd

2007 – 2008 - Project Manager – Matakoma-ARM, Heritage Contracts Unit, University of the Witwatersrand

2005-2007 - Director – Matakoma Heritage Consultants (Pty) Ltd

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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, Malawi, Mauritius, Zimbabwe and the Democratic Republic of the Congo



MPUMALANGA PROVINCIAL GOVERNMENT
DEPARTMENT OF PUBLIC WORKS, ROADS
AND TRANSPORT



CONTRACT NO.: PWRT/2388/18/MP

PROJECT NAME: UPGRADING OF ROAD D4407 BETWEEN HLUVUKANI AND TIMBAVATI (7.82 km) ROAD D4409 AT WELVERDIEND (6.88 km) AND ROAD D4416/2 BETWEEN WELVERDIEND AND ROAD P194/1 (1.19 km) IN THE BOHLABELA REGION OF THE MPUMALANGA PROVINCE

SUBJECT: GRAVES WITHIN THE ROAD RESERVE AT CH 5+450 OF ROAD D4409

This is to record and confirm the following:

1. On Wednesday, 22 January 2020, the Thete family representative, Mr. Lion Thete, confirmed that the claim made on 17 July 2019, that they have family graves within the road reserve at CH 5+450 of Road D4409, are not correct and were made without consultation with the entire family.
2. The known grave is some few meters outside the road reserve, between the two large trees indicated to the stakeholders on Site, and do not interfere with the road alignment.
3. The Thete family representative gives permission for the road construction to proceed as per the original alignment.
4. Mr. Lion Thete confirmed the above while on Site, in the presence of the following project stakeholders, as witnesses:
 - a. CLO - Jomo Ubisse
 - b. PSC Member - Goodman Shabangu
 - c. Assistant Resident Engineer – Cuthbert Karimanzira
 - d. Materials Technician – Neo Mafoka
5. Signed by:

First Name & Surname	Signature	Date
Jomo Ubisse		24/01/2020
Goodman Shabangu		24/01/2020
Cuthbert Karimanzira		24/01/2020
Neo Mafoka		24/01/2020