PROJECT NAME: PROPOSED MOTUOANE LADYSMITH EXPLORATION RIGHT

HERITAGE STUDY: SCOPING LEVEL REPORT

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FOR

ENVIRONMENTAL IMPACT MANAGEMENT SERVICES (PTY) LTD

Professional Grave Solutions (Pty) Ltd T/A PGS Heritage & Grave Relocation Consultants
PO Box 32542 Totiusdal 0134, T +27 12 332 5305 F: +27 86 675 8077
Reg No 2003/008940/07

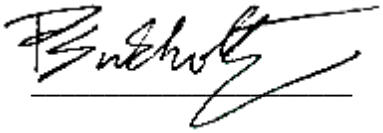
DETAILS OF CLIENT AND AUTHOR

CLIENT: Environmental Impact Management Services (Pty) Ltd

CONTACT PERSON: Bongani Khupe, Environmental Impact Management Services (Ltd)
Tel: (011) 789-7170, Fax: (011) 787- 3059, email: bongani@eims.co.za

LEADING CONSULTANT: PGS Heritage

CONTACT PERSON: Polke Birkholtz
Tel: (012) 332 5305, Email: polke@pgsheritage.co.za

SIGNATURE: 

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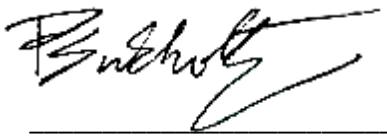
DECLARATION OF INDEPENDENCE AND SUMMARY OF EXPERTISE

The report has been compiled by PGS Heritage, an appointed Heritage Specialist for Environmental Impact Management Services. The views stipulated in this report are purely objective and no other interests are displayed during the decision making processes discussed in this assessment.

HERITAGE CONSULTANT: PGS Heritage

CONTACT PERSON: Polke Birkholtz

SIGNATURE: 

Polke D. Birkholtz has been actively involved in the heritage industry since 1997 during which time he has completed in excess of 280 heritage and archaeological projects across South Africa. He is well versed in the applicable legislation as it relates to heritage in South Africa.

EXECUTIVE SUMMARY

PGS Heritage was appointed by Environmental Impact Management Services (EIMS) to undertake a Heritage Scoping Report for the proposed Motuoane Ladysmith Exploration Right. The study area is located north of Ladysmith and within the Emnambithi / Ladysmith Local Municipalities of the Uthukela District Municipality and is situated within the Kwazulu-Natal Province.

The purpose of the Heritage Scoping report is to identify at a desktop level what the probability is of heritage resources being identified in the study area. This is important because heritage resources are protected in terms of the National Heritage Resources Act, No 25 of 1999, (NHRA) from *inter alia*, destruction or damage, excavation or removal, or other disturbance, without a permit from the responsible heritage resources authority. The National Heritage Resources Act, No 25 of 1999, (NHRA) states that heritage resources are unique and non-renewable and, as such, any impact on such resources must be seen as significant (NHRA, section 5(1)(a)). The NHRA specifically protects certain categories of heritage resources, i.e.: structures, archaeological and paleontological (including meteorological) sites and material and graves and burial grounds (NHRA, sections 34, 35 and 36). Furthermore, Section 38 of the NHRA provides for and regulates the compilation of impact assessment reports of heritage resources that may be affected by construction or development activities.

The desktop research for the Heritage Scoping Report has revealed that the study area and surrounding landscape have a long and diverse historical and archaeological history and that significant potential exists for archaeological and historical sites and material to be located within the study area. The research has also identified specific possible heritage sensitive areas within the study area.

The Scoping Report will be followed by a a Heritage Impact Assessment (HIA), which would include the findings of this desktop study report and would provide recommendations for mitigation (destruction, recording and/or avoidance) of the confirmed heritage resources to be impacted upon by the proposed development. The period in-between the existing Heritage Scoping Report and the Final Heritage Impact Assessment Report will be used to finalise any footprints relating to the proposed exploration activities.

The Heritage Scoping Report has highlighted a number of heritage aspects, some of which would require further assessment and mitigation in the subsequent Heritage Impact Assessment report. These aspects include two sensitivities associated with the South African War (1899-1902) namely the Siege of Ladysmith (2 November 1899 – 27 February 1900) as well as a number of battlefields. Other aspects identified include historic settlements, archaeological sites, historic buildings and structures, cemeteries, palaeontology as well as unmarked graves from within the study area.

Siege of Ladysmith (2 November 1899 – 27 February 1900)

The South African War (1899-1902) had a significant impact across the country, and also within the study area. The archival and historical desktop study has revealed that sections of the Siege of Ladysmith (2 November 1899 - 27 February 1900) were located within the present study area. This siege represents one of the three major sieges which the Boer forces undertook during the first few months of the war, the other two being Kimberley and Maheking. The research undertaken for the present study has shown that sections of the Boer siege lines were located within the study area, as were the main Boer positions at Rifleman's Ridge, Lancer's Nek, Telegraph Ridge, Thornhill Kop, Surprise Hill, an Unknown Ridge as well as Pepworth Hill. The positions and approximate extents of these historically significant features were recorded and included in this report.

Areas of expected sensitivity in terms of the siege were highlighted on the sensitivity map. If at all possible, this area should be avoided in the placement of development footprints. Furthermore, archaeological field surveys of the proposed development footprint areas during the Heritage Impact Assessment should identify any tangible remains of the battle and the associated heritage impact assessment would address any percieved significant impacts on this battle and its associated tangible remains. Additionally, such field assessments must be augmented by further archival and historical research, especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment.

Battlefields associated with the South African War (1899 – 1902)

The archival and historical desktop study has also revealed that a number of battles of the South African War (1899-1902) occurred within the study area, namely Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (as part of the British assault on Lancer's Hill) (3 & November 1899) as well as the British raid on a Boer artillery position at Surprise Hill (10 & 11 December 1899. The positions and approximate extents of these historically significant features were recorded and included in this report.

Areas of expected sensitivity in terms of the siege were highlighted on the sensitivity map. If at all possible, this area should be avoided in the placement of development footprints. Furthermore, archaeological field surveys of the proposed development footprint areas during the Heritage Impact Assessment should identify any tangible remains of the battle and the associated heritage impact assessment would address any percieved significant impacts on this battle and its associated tangible remains. Additionally, such field assessments must be augmented by further archival and historical research, especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment.

Historic Settlements

Six historic settlements or towns were identified within the study area during the historic background study. These settlements are also depicted on the First Edition maps sheets. These settlements are Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. The historic research has shown that many of these settlements had origins dating back to the mid-nineteenth century. The positions of these settlements as well as their approximate extents were recorded and included in this report.

The areas included in the sensitivity maps should ideally be avoided during the placement of development footprints. Archaeological and heritage field surveys of the development footprint areas must be undertaken once these have been established. Additionally, such field assessments must be augmented by further archival and historical research, especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment Report.

Archaeological Sites

The Archaeological Database of the Natal Museum was accessed for this study to assess whether any known archaeological sites are located within the present study area. A study of the database maps revealed that eight archaeological sites listed on the museum database are located within the present study area. Of the eight archaeological sites from the database that fall within the study area, five are Stone Age sites. Two of these sites comprise rock shelters (2829BD 1 & 2829BD 2), one site consists of three indivdiual rock shelters and contains rock art (2829BB 8) while the other two sites comprise lithics that were revealed by erosion (2829DA 4 & 2829BC 5). The remaining three sites from within the study area (2829DB 11, 2829DB 45 & 2829DB 46) can all be associated with the Late Iron Age.

The recorded localities of these archaeological sites as recorded on the heritage sensitivity maps should ideally be avoided during the placement of development footprint areas. All proposed development footprints will have to be assessed in the field by way of archaeological field surveys to identify any archaeological sites and features which may be located within those footprint areas. These studies will be required to determine the significance of each site and to assess the possible development impacts on each of them during the Heritage Impact Assessment phase. If required, further mitigation measures will be outlined in the Heritage Impact Assessment Report.

Historic Buildings and Structures

The existence of historic buildings and structures within the study area was revealed during the desktop study, when the first edition topographic sheets were found to depict a large number of historic buildings and structures. Due to

the large extent of the study area as well as the high number of these depicted features, the historic structures and buildings depicted on these maps were not individually recorded nor included in the existing heritage significance maps. An assessment of previous archaeological and heritage studies from within the study area has revealed the presence of one such a historic structure within the study area.

Once development footprints are defined, such footprint areas will have to be assessed in the field by way of archaeological field surveys to identify any historic buildings or structures which may be located within the development footprint areas. Additionally, an assessment by an architectural historian of each historic building and structure located within or near such footprint areas will also have to be undertaken. These studies will be required to determine significance of each building or structure and will assess the possible development impacts on each of them during the Heritage Impact Assessment phase. At the same time appropriate mitigation measures will also be outlined.

Graves and Cemeteries

The existence of graves and cemeteries has been confirmed during the desktop study work, with the presence of 21 cemeteries within the study area revealed during an assessment of historic topographic maps sheets as well as the use of the cemetery database of the Genealogical Society of South Africa. The individual positions of these cemeteries were recorded and these were included in the sensitivity maps. The possibility that even more cemeteries may be located within the study area is a distinct possibility.

The recorded localities of these cemeteries as depicted on the heritage sensitivity maps should ideally be avoided during the placement of development footprint areas. Any marked graves and cemeteries located within future development footprint areas will be identified during the archaeological walkthroughs of those footprint areas. Cemeteries and grave sites are protected by various legislations and the best option would be the in situ preservation of the sites. Should this not be possible, a standard grave relocation process (including a detailed social consultation process) must be undertaken.

Unmarked Graves in Homesteads

An evaluation of the available historic maps has revealed a significant number of historic homesteads of black African communities within the study area. The presence of these features raises another heritage concern, that of unmarked stillborb babies. In terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Cemeteries and grave sites are protected by various legislations and the best option would be social consultation with the former (or present) residents of this area to assess whether any

such unmarked graves are located within the final study area for the Heritage Impact Assessment. This mitigation measure must be supported by archaeological monitoring of the development activities.

Palaeontology

The palaeontological significance of the study area is not known at the moment. However, during the EIA Phase a palaeontologist will be appointed to undertake a palaeontological desktop study of the exploration footprint areas.

The data on the different types of heritage resources identified from the fieldwork will be compiled in a final HIA report. This report will utilise the Plan of Study for the EIA/HIA (***Section*** 8) as well as the significance rating (***ANNEXURES A and B***) to identify and rank the impacts on the heritage resources into the final detailed EIA investigation.

Potential impacts to be identified and evaluated during the EIA include:

- Disturbance / destruction of components of the Siege of Ladysmith
- Disturbance / destruction of various battlefields associated with the South African War
- Disturbance / destruction of historic settlements from within the study area
- Destruction / damage of archaeological sites
- Disturbance / destruction of historic buildings and structures
- Disturbance / destruction of cemeteries and graves
- Disturbance / destruction of unmarked stillborn graves
- Disturbance / destruction of palaeontological material

Once the development footprint areas are defined, these will have to be assessed by way of detailed walkthroughs during the HIA phase of the project. This will allow for an assessment of the impact of the proposed development on any heritage sites located there.

Table 1- Potential Impacts to Consider for the Heritage Impact Assessment Phase

	IMPACT	STAGE OF PROJECT
ISSUE	**DISTURBANCE OR DESTRUCTION OF COMPONENTS OF THE SIEGE OF LADYSMITH**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study has revealed that components of the Siege of Ladysmith (2 November 1899 – 27 February 1900) are located within the present study area. These comprise a section of the line held by the Boer forces during the siege, as well as some of their positions such as Pepworth Hill, Surprise Hill, Thornhill Ridge, Telegraph Ridge, Lancer's Nek as well as the Rifleman's Ridge.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	The Siege of Ladysmith can be defined as battlefields. Such battlefields are protected by the NHRA, and under certain circumstances the core components of a particular battle site can be defined as a cultural landscape worth protecting. The area within which this component of the battle took place was included in the sensitivity mapping. This area should ideally be excluded from any future work. However, should any footprints be located within or near this area, archaeological fieldwork and further archival and historical research coupled with the compilation of a heritage impact assessment should represent sufficient identification of any remaining tangible heritage aspects.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The area included in the sensitivity map should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on the battle whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should tangible or intangible sites or features be identified that will be impacted upon by the proposed development, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation

		measures such as the archaeological excavation and mitigation of identified tangible components of the siege must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF BATTLEFIELDS**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study has revealed that a number of battles associated with the South African War (1899 – 1902) occurred within the study area. These include Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (as part of the British assault on the position at Lancer's Hill) (3 & 4 November 1899) as well as the British raid on the Boer artillery position at Surprise Hill (10 & 11 December 1899).	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Battlefields are protected by the NHRA, and under certain circumstances the core components of a particular battle site can be defined as a cultural landscape worth protecting. The area within which this component of the battle took place was included in the sensitivity mapping. This area should ideally be excluded from any future work. However, should any footprints be located within or near this area, archaeological fieldwork and further archival and historical research coupled with the compilation of a heritage impact assessment should represent sufficient identification of any remaining tangible heritage aspects.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The area included in the sensitivity map should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on the battle whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should tangible or intangible sites or features be identified that will be impacted upon by the	

	proposed development, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF HISTORIC SETTLEMENTS**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study as well as the assessment of the First Edition Topographic Sheets has revealed the existence of a number of historic settlements within the study area. These include Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. The historic research undertaken for the present study area has shown that many of these settlements had origins dating back to the mid-nineteenth century	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified archaeological sites can seriously hamper construction and development activities and timelines. Destruction or damage of such sites requires a permit from the responsible heritage authority (NHRA, section 35). Fieldwork can provide valuable information on such sites in the study area and provide timeous management through various mitigation measures, including the realignment of the construction activities, if necessary.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The areas included in the sensitivity maps should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the development footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on these concentration camps whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should archaeological sites be identified, suitable mitigation measures will have to be outlined.	

WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF ARCHAEOLOGICAL SITES**	**CONSTRUCTION**
DISCUSSION	The Archaeological Database of the Natal Museum was accessed which revealed that eight archaeological sites are known to be located within the study area. These comprise five Stone Age sites and three Late Iron Age sites. The possibility certainly exists for more archaeological sites to be located within the study area, Once the development footprint areas have been confirmed, an archaeological foot survey must be undertaken of these footprint areas to identify any archaeological sites located there. This would assist in developing a comprehensive Heritage Management Plan for the construction activities.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified archaeological sites can seriously hamper construction and development activities and timelines. Destruction or damage of such sites requires a permit from the responsible heritage authority (NHRA, section 35). Fieldwork can provide valuable information on any such sites from the study area and provide timeous management of such sites, including the realignment of the construction activities, if necessary.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The known archaeological sites as revealed by the Natal Museum Archaeological Database should be avoided during the placement of development footprints. The identification of yet undiscovered archaeological sites would be addressed by way of archaeological and heritage field surveys of the footprint areas, once these have been established. Should archaeological sites be identified, suitable mitigation measures will have to be outlined.	

WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF HISTORIC BUILDINGS OR STRUCTURES**	**CONSTRUCTION, OPERATION**
DISCUSSION	The existence of historic buildings and structures within the study area was revealed during the desktop study, when the first edition topographic sheets were found to depict a number of historic buildings and structures. Due to the large extent of the study area, and the relatively high number of these depicted features, the historic structures and buildings depicted on these maps were not individually recorded nor included in the existing heritage significance maps. The possible presence of even more historic structures appears likely.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Damage or destruction of farm buildings and associated structures. Destruction or damage of such sites older than 60 years, would requiree a permit from the responsible heritage authority.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	An archaeological and heritage field survey of any additional footprint areas not yet assessed. Should such sites be identified, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF GRAVES AND CEMETERIES**	**CONSTRUCTION**
DISCUSSION	The existence of graves and cemeteries has been confirmed during the desktop study work, with the presence of 17 cemeteries within the	

	study area revealed during an assessment of historic topographic maps. Furthermore, the cemetery database of the Genealogical Society of South Africa was also accessed which has four cemeteries located within the study area. The individual positions of these cemeteries were recorded and were included in the sensitivity maps. The possibility that more cemeteries may be located within the study area is a distinct possibility.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified graves and cemeteries and the discovery of such sites can seriously hamper construction and development timelines. Damage, destruction or removal of such sites requires a permit from various responsible authorities, including the Heritage Authority (NHRA, section 36), Provincial Health Department and the SA Police Service. Such a process can take up to 12 months to finalise. Fieldwork can provide valuable information on the presence of such sites in the study area and provide timeous management of such sites, which may include the realignment of the proposed development activities. In the event that identified graves and cemeteries cannot be avoided, a grave relocation process needs to be initiated, bearing in mind that such a process impacts on the spiritual and social fabric of the next of kin and associated communities.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	Avoidance of the identified cemeteries and graves in future proposed exploration footprints (where possible) and an archaeological field survey of any additional footprint areas not yet assessed. Should graves and cemeteries be identified, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas need to be demarcated. Alternatively, mitigation measures such as the physical relocation of the graves in question (including aspects such as detailed social consultation) needs to be planned and scheduled to fit within the timing of the project phases. It must be understood that such a process may have an impact on the spiritual and social fabric

		of the next of kin and associated communities.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF UNMARKED GRAVES**	**CONSTRUCTION**
DISCUSSION	From experience on similar sites and the knowledge of cultural customs and traditions, it is known that stillborn babies and deceased infants occasionally were buried within the homesteads of black rural communities. These children were sometimes buried underneath the floors and walls of houses and huts and the burials were not marked, but were known to the immediate family.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified graves and the discovery of such sites can seriously hamper construction and development timelines. Damage, destruction or removal of such sites requires a permit from various responsible authorities, including the Heritage Authority (NHRA, section 36), Provincial Health Department and the SA Police Service. Such a process can take up to 12 months to finalise. Social consultation with present and former residents of the study area can provide valuable information on the presence of such sites in the study area and provide timeous management of such sites, which may include the realignment of the proposed development activities. Archaeological monitoring of the development footprint areas will identify any unmarked human skeletal remains. In the event that such graves cannot be avoided, a grave relocation process needs to be initiated, bearing in mind that such a process impacts on the spiritual and social fabric of the next of kin and associated communities.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	A social consultation process with current and former residents of the study area can assess whether such sites are located within the study area. Archaeological monitoring during construction will also identify any human skeletal remains.	
WHEN IS MITIGATION REQUIRED		During design and before construction, social consultation needs to take place to

		assess whether such sites are located within the footprint areas. Archaeological monitoring during the construction phase will also identify any human remains.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE, DAMAGE OR DESTRUCTION OF PALAEONTOLOGICAL RESOURCES**	**CONSTRUCTION, OPERATIONAL**
DISCUSSION	The palaeontological significance of the study area is not known at the moment. However, during the EIA Phase a palaeontologist will be appointed to undertake a palaeontological desktop study of the footprint areas.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified palaeontological resources and the discovery of such resources can seriously hamper construction and development timelines. Damage, destruction or removal of such sites require a permit from the responsible heritage authority (NHRA, section 35).	Destruction or damage during the construction of the pipelines and other development components.
EIA INVESTIGATION REQUIRED	The mitigation measures recommended in the palaeontological desktop study must be undertaken.	
WHEN IS MITIGATION REQUIRED		During design and before construction, the mitigation measures outlined in the palaeontological desktop study will have to be undertaken.

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ANNEXURES

1. INTRODUCTION

PGS Heritage was appointed by Environmental Impact Management Services (EIMS) to undertake a Heritage Scoping Report for the proposed Motuoane Ladysmith Exploration Right. The study area is located north of Ladysmith and within the Emnambithi / Ladysmith Local Municipalities of the Uthukela District Municipality and is situated within the Kwazulu-Natal Province.

2. SCOPE OF WORK

PGS Heritage was appointed by EIMS, to undertake a Heritage Scoping Assessment (HSA), that will be used (with other specialist desktop studies) to assess the feasibility of the proposed project as well as to design the proposed project in such a way that impacts are minimised. The HSR is aimed at identifying potential heritage resources located within the study area and surrounds and to identify the potential impacts that may be experienced by the resources as a result of the proposed project. In addition, the scoping study will serve as a Plan of Study for the HIR, which will include a detailed investigation of the heritage resources and the impact the proposed project may have on them. Mitigation measures will then also be suggested that will contribute to the overall EMPR for the whole project.

The scope of work for the Scoping Phase of the project can be itemised as follows:

- Desktop description of the baseline receiving environment specific to the field of expertise (general surrounding as well as site specific environment);
- Identification and description of any sensitive receptors in terms of heritage features that occur in the study area, and the manner in which these sensitive receptors may be affected by the activity;
- Screening to identify any critical issues relating to cultural heritage (potential fatal flaws) that may result in project delays or rejection of the application;
- Provide a map identifying sensitive receptors in the study area, based on available maps, database information & site visit verification;
- Provide a GIS sensitivity map of the study area;
- Identification and description of any impacts that may result from the proposed activities (both mining and supplementary) during all phases of the project, including cumulative, residual and latent impacts. All phases of the project should be considered and these phases shall be classified as: (a) Planning and Design (b) Construction (c) Operation (d) Decommissioning and (e) Rehabilitation and Closure.
- Identification of any legislated constraints (e.g. "No-Go" areas or buffer zones) and preparation of a map illustrating No-Go areas and buffers (if relevant);
- Identify any gaps in knowledge, data or information that could hamper the impact identification and evaluation process;

- Identification and justification (screening to obtain key issues) of impacts which require further investigation during the EIA phase (including further specialist inputs);
- Identify any legal provisions relevant to the specific field of expertise and the proposed activity (including relevant legislation, both National and Provincial, Department Guidelines and Management Frameworks);
- Provide a detailed plan of study for the EIA and EMP, including;
- A description of the tasks that should be undertaken and the manner in which these tasks should be undertaken;
- A description of the proposed methodology;
- Presentation of the study findings to the client.

2.1 Site Location

The study area extends north from approximately Ladysmith, through Watersmeet, east of Besters and south of Droogdal. The Sunday's River cuts across the central portion of the study area, the Klip River down the south-western component of the study area and the San River across a small section of the study area situated immediately to the west of Ladysmith. The N11 highway between the N3 and Newcastle, runs along but outside the southern and eastern boundaries of the study area, and only cuts through the study area on its south-eastern extremity.

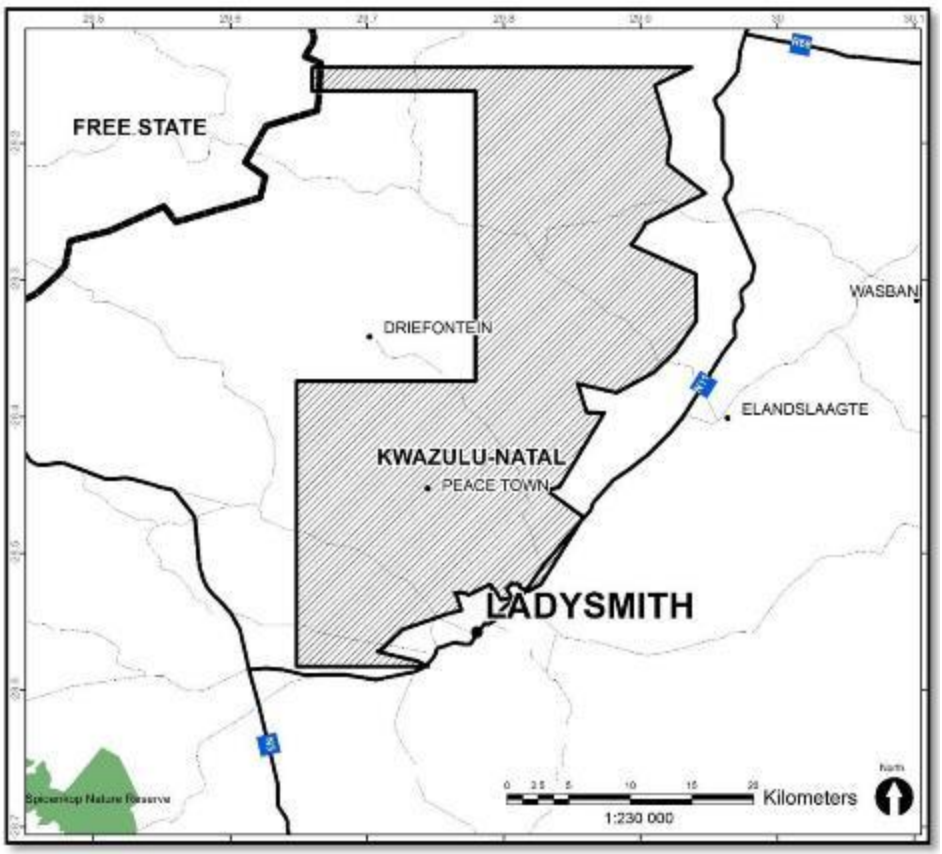

Figure 1 - The study area within its regional context. This plan was supplied by the client.

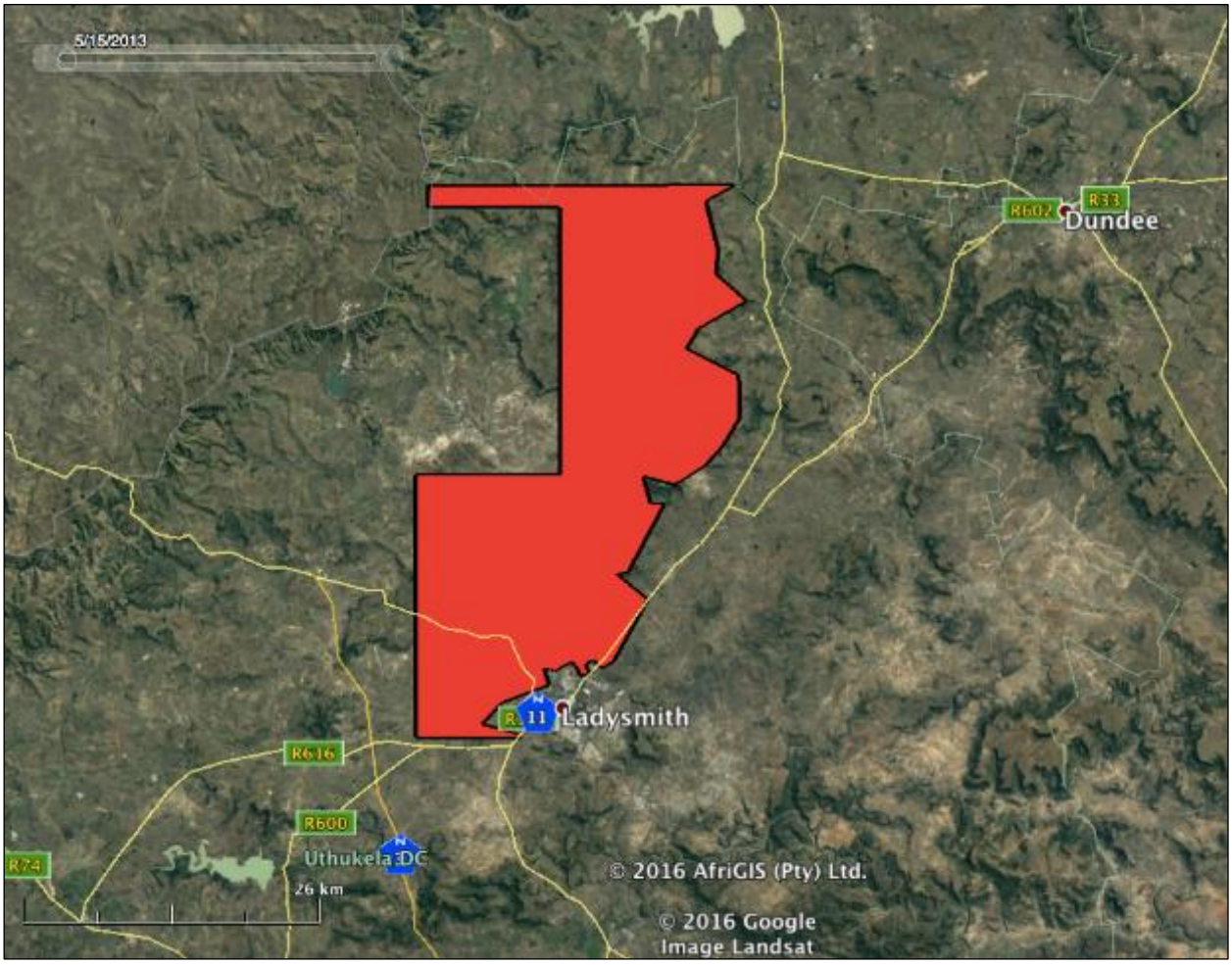

Figure 2 – Google Earth image depicting the study area within its regional context

The coordinates defining the study area boundary are as follows:

- Northernmost point near Droogdal - S 28.144671 E 29.883234
- Westernmost point near Kleinfontein - S 28.374515 E 29.648497
- Easternmost point near Indanyana - S 28.236826 E 29.946909
- Southernmost point near Ladysmith - S 28.583069 E 29.743895
- Approximate Centre Point near Klipfontein - S 28.391967 E 29.815803

As such, the overall study area for the present Heritage Scoping Report covers an area of approximately 77 490 hectares.

Locality maps depicting the study area within its regional context can be seen in Figures 1 and 2.

3. METHODOLOGY

An evaluation of the archaeological and historical background of the study area was required to establish the possible heritage resources to be found. Therefore, a literature search of published sources, archival sources and internet sources were undertaken to compile a general background of the study area and surrounding landscape. This was followed by study area specific research to identify potential heritage impacts which may be located within the study area. This component comprised an assessment of archival and historical maps as well as an examination of Google Earth satellite imagery. All of the desktop study findings were used to compile heritage sensitivity maps for the study area.

It is important to note that the archaeological and heritage sites revealed during the desktop study do not represent the entire heritage site database of the study area. As such, a more detailed footprint-specific heritage inventory would be required during the Heritage Impact Report phase of the project.

4. LEGISLATIVE AND POLICY FRAMEWORK

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

i. National Environmental Management Act (NEMA), Act 107 of 1998
ii. National Heritage Resources Act (NHRA), Act 25 of 1999
iii. Minerals and Petroleum Resources Development Act (MPRDA), Act 28 of 2002
iv. Development Facilitation Act (DFA), Act 67 of 1995

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

i. National Environmental Management Act (NEMA), Act 107 of 1998:
    a. Basic Environmental Assessment (BEA) – Section (23)(2)(d)
    b. Environmental Scoping Report (ESR) – Section (29)(1)(d)
    c. Environmental Impacts Assessment (EIA) – Section (32)(2)(d)
    d. Environmental Management Plan (EMP) – Section (34)(b)
ii. National Heritage Resources Act (NHRA), Act 25 of 1999:
    a. Protection of Heritage resources – Sections 34 to 36; and
    b. Heritage Resources Management – Section 38
iii. Minerals and Petroleum Resources Development Act (MPRDA), Act 28 of 2002:
    a. Section 39(3)
iv. Development Facilitation Act (DFA), Act 67 of 1995:

a. The GNR.1 of 7 January 2000: Regulations and rules in terms of the Development Facilitation Act, 1995. Section 31.

The NHRA stipulates that cultural heritage resources may not be disturbed without authorization from the relevant heritage authority. Section 34(1) of the NHRA states that, "no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority…" The NHRA is utilized as the basis for the identification, evaluation and management of heritage resources and in the case of CRM those resources specifically impacted on by development as stipulated in Section 38 of NHRA, and those developments administered through NEMA, MPRDA and the DFA legislation. In the latter cases the feedback from the relevant heritage resources authority is required by the State and Provincial Departments managing these Acts before any authorizations are granted for development. The last few years have seen a significant change towards the inclusion of heritage assessments as a major component of Environmental Impacts Processes required by NEMA and MPRDA. This change requires us to evaluate the Section of these Acts relevant to heritage (Fourie, 2008b):

The NEMA 23(2)(b) states that an integrated environmental management plan should, "…identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage".

A study of subsections (23)(2)(d), (29)(1)(d), (32)(2)(d) and (34)(b)and their requirements reveals the compulsory inclusion of the identification of cultural resources, the evaluation of the impacts of the proposed activity on these resources, the identification of alternatives and the management procedures for such cultural resources for each of the documents noted in the Environmental Regulations. A further important aspect to be taken account of in the Regulations under NEMA is the Specialist Report requirements laid down in Section 33 of the regulations (Fourie, 2008b).

MPRDA defines 'environment' as it is in the NEMA and therefore acknowledges cultural resources as part of the environment. Section 39(3)(b) of this Act specifically refers to the evaluation, assessment and identification of impacts on all heritage resources as identified in Section 3(2) of the National Heritage Resources Act that are to be impacted on by activities governed by the MPRDA. Section 40 of the same Act requires the consultation with any State Department administering any law that has relevance on such an application through Section 39 of the MPRDA. This implies the evaluation of Heritage Assessment Reports in Environmental Management Plans or Programmes by the relevant heritage authorities (Fourie, 2008b).

In accordance with the legislative requirements and EIA rating criteria, the regulations of the South African Heritage Resources Agency (SAHRA) and Association of Southern African Professional Archaeologists (ASAPA) have also been incorporated to ensure that a comprehensive and legally compatible HSR report is compiled.

The heritage impact assessment criteria to be utilised in the HIR are described in more detail in ***Annexure A***; while the Environmental Impact Scoring criteria to be utilised in the HIR, are provided in ***Annexure B***.

4.1 Assumptions and Limitations

The following assumptions and limitations with regard to the present study exist:

- The aim of the Heritage Scoping Report is to identify the possible types of heritage resources that might be present in the study area, as well as possible hotspots for the locality of such resources. From this, the possible impacts from development activities must be predicted. It must be noted that the findings of this report will require confirmation by undertaking a physical survey as part of the final evaluation of the development footprints during the EIA Phase. Since the current information is based only on a literature and archival search and investigation of other desktop resources (maps and satellite imagery), **this report can certainly not be seen as at the level required for a HIR**.

- Due to the large extent of the study area assessed for this Heritage Scoping Report (approximately 77 490 hectares), it is clear that not all possible heritage sites located within the study area could be included in this report. A case in point of this would be the large number of possible heritage buildings and structures (farmhouses, farm buildings and farmworker accommodation) depicted on the First Edition Topographical Map Sheets. Due to their large number, the large extent of the study area and temporal constraints, these numerous possible heritage sites were not included in the findings of this report. Fieldwork focussed on the development footprints during the EIA phase would address this aspect.

- Due to the large extent of the study area, this Heritage Scoping Report does not include any findings or assessments relating to palaeontological heritage. Once the EIA phases commences the palaeontological significance of the actual footprint areas will be assessed by way of a palaeontological desktop study, subsequent to which further mitigation measures may be required.

- The sensitive areas associated with the South African War (the Siege of Ladysmith and the battles of Rietfontein, Modderspruit, Nicholson's Nek, Surprise Hill and Rifleman's Ridge) were defined using information such as battle maps and descriptions found in numerous publications. However, as with all aspects of history, the exact extents of these battlefields and siege lines can likely be seen as an estimation only. As a result, the sensitive areas associated with these areas were made larger than what the battlefields necessarily themselves were. Furthermore, fieldwork focussed on the development footprints during the EIA phase would also assist in addressing any potential for impacts taking place to such sites.

Terminology/Abbreviations

Table 2- Abbreviations

ACRONYMS	*DESCRIPTION*
ASAPA	Association of South African Professional Archaeologists
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
DMR	Department of Mineral Resources
EIA practitioner	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme Report
ESA	Early Stone Age
GPS	Global Positioning System
HIA	Heritage Impact Assessment
HIR	Heritage Impact Report
HSR	Heritage Scoping Report
I&AP	Interested & Affected Party
LSA	Later Stone Age
LIA	Late Iron Age
MSA	Middle Stone Age
NEMA	National Environmental Management Act
NHRA	National Heritage Resources Act
PASA	Petroleum Agency South Africa
PHRA	Provincial Heritage Resources Authority
PSSA	Palaeontological Society of South Africa
RoD	Record of Decision
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Agency

The following definitions are taken from the National Heritage Resources Act, no 25 of 1999 (NHRA, section 2):

Archaeological resources

This includes:

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

Cultural significance

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

Development

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

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

Fossil

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

Heritage

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

Heritage resources

This means any place or object of cultural significance.

Holocene

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

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.

5. TECHNICAL DETAILS OF THE PROJECT

5.1 Overview of Proposed Project

This project entails exploration for hydrocarbons and associated gas. The exploration techniques to be employed during the operations include *inter alia* geological mapping, geochemical soil sampling, water sampling and drilling for geological core samples.

Approximately four (4) boreholes will be drilled. The boreholes will be drilled in order to obtain core samples (rock samples), which will be analysed to determine hydrocarbon content (if any). **No well stimulation (e.g. fracking) will be undertaken during this drilling process.**

The proposed Motuoane Ladysmith Exploration Project, if approved, will allow Motuoane Energy to determine if there is an economically viable resource available in the area. It is important to note that the exploration right does not approve any production activities. As such, any future intention to undertake production of hydrocarbons within the exploration right area would require a further application, investigation (including comprehensive EIA) and public consultation process.

The Motuoane Ladysmith Exploration Project covers an area of approximately 77 490 hectares. The total area to be disturbed by exploration activities will be minimal based on the relatively non-invasive exploration techniques (4 X (30mx30m) drill sites = 0.36 ha with associated access roads). **As indicated above, no no well stimulation (e.g. fracking) is to take place during this exploration activity.** This proposed project does not include hydrocarbon production (i.e. a production right application would be required at a later stage should the applicant wish to pursue this option and additional public consultation would be required during this process).

5.2 Proposed Drilling Activities

Drilling of approximately four boreholes will provide solid core samples that can be analysed for the presence of hydrocarbons and the physical properties of the rocks.

Drilling requires the clearance of an area of 30m by 30m at each drill site for the placement of the drill rig with subsequent rehabilitation of the disturbed area following completion of the drilling operation. Typical boreholes size is NQ -75.5 mm in diameter on the inside.

Diamond core drilling is the most common style of exploration drilling, which produces a solid core sample that is extracted for examination on the surface. This method of drilling provides an accurate assessment of the deposit as no other particles have a chance to contaminate the sample.

The key technology to diamond drilling is the actual diamond drill bit, which is comprised of industrial diamonds set into a soft metallic matrix. The drill bit is mounted onto a drill stem, which is connected to a rotary drill. Water (~5m^3/day and obtained from licensed sources and not the local environment) is injected into the drill pipe to wash out the rock cuttings produced by the bit. Return water will be stored in sumps, which comprise compartmentalised steel tanks that will be placed on surface to contain the drilling mud. No sumps will therefore be dug into the soil. This water will be recycled (sediments removed) and reused in the drilling process. No disposal of water or sediments into the environment will be permissible).

On completion of the exploratory drill sites, the boreholes would be suitably capped to prevent ingress or egress of materials, substances, etc. and the disturbed area will be reinstated and rehabilitated (EIMS, 2016).

Figure 3

A typical drill rig used during diamond core drilling. This image was supplied by the client (EIMS, 2016).

6. GENERAL BACKGROUND TO THE STUDY AREA AND SURROUNDING LANDSCAPE

6.1 Historical and Archaeological Overview of the Study Area and Surrounding Landscape

The KwaZulu-Natal Province has a rich archaeological and historical history going back millions of years and includes significant aspects such as Later Stone Age rock art, Battlefields and Iron Age stonewalled enclosures. The general surroundings of the study area became a melting pot of contact and conflict as it represents one of many frontiers where San hunter-gatherers, Nguni agro-pastoralists, Dutch Voortrekkers and British Colonists all came together. The ravages of war also swept across these plains, and in particular the South African War (1899-1902).

The archaeological history of the area can broadly be divided into a Stone Age, Iron Age and Historic Period. Both the Stone and Iron Ages form part of what is referred to as the Pre-Colonial Period (Prehistoric Period) whereas the Historic Period is referred to as the Colonial Period (Historic Period) (refer **Figure 2**).

In the table below a detailed archaeological and historical overview of the study area and surrounding landscape is presented in a chronological manner. This overview is based on intensive archival and literature research and whenever possible, the relative distances between the study area and mentioned sites, features and events are provided.

It must be noted that such an overview, which is based on available literature and archival research, would necessarily reflect a bias toward a traditional white history of the region as this would have been the focus of publications and archival documents during the last 150 years.

In the sections that follow, known heritage resources from within the study area as revealed by way of various techniques will be outlined and briefly discussed.

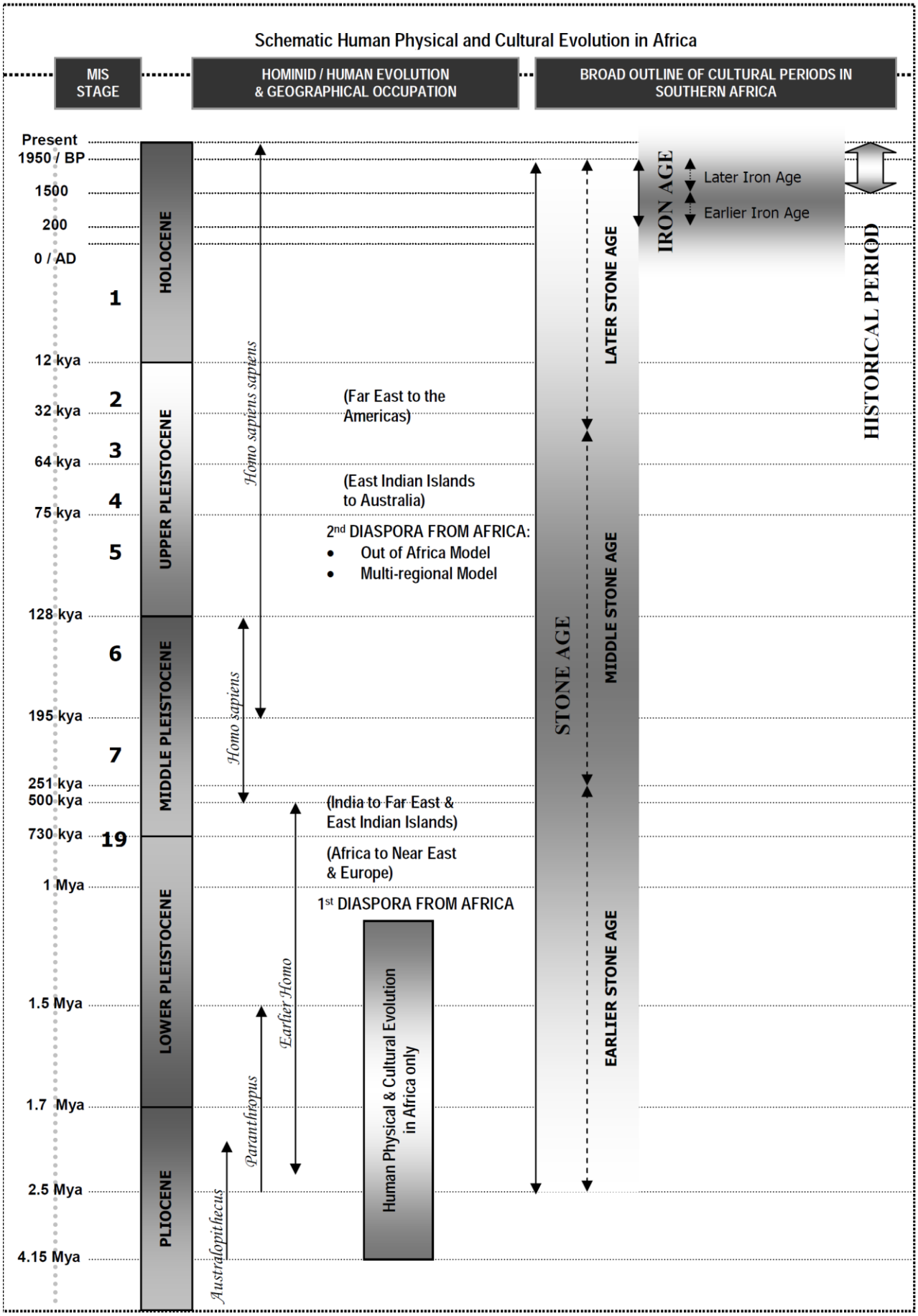

Figure 4 – Human and Cultural Time line in Africa (Morris, 2008)

Table 3- Archaeological and Historical Overview of the Study Area and Surrounding Landscape

DATE	DESCRIPTION
The Study Area during the Stone Age	
With the exception of the Later Stone Age, very little is known about the Stone Age archaeology of the study area and its immediate surroundings. As will be shown below, some work was done by the pioneer archaeologist of Kwazulu-Natal, Professor Oliver Davies, during the twentieth century. For the purposes of the present study, the Natal Museum was visited to access their Archaeological Database. Of the eight archaeological sites from the database that fall within the study area, five are Stone Age sites. Two of these sites comprise rock shelters (2829BD 1 & 2829BD 2), one site consists of three indivdiual rock shelters and contains rock art (2829BB 8) while the remaining two sites comprise lithics that were revealed by erosion (2829DA 4 & 2829BC 5).	
2.5 million to 250 000 years ago	The Earlier Stone Age (ESA) is the first and oldest phase identified in South Africa's archaeological history and comprises two technological phases. The earliest of these is known as Oldowan and is associated with crude flakes and hammer stones. It dates to approximately 2 million years ago. The second technological phase is the Acheulian and comprises more refined and better made stone artefacts such as the cleaver and bifacial hand axe. The Acheulian dates back to approximately 1.5 million years ago. The exact Stone Age typology of the lithics observed at sites 2829DA 4 and 2829BC 5 are not presently known, but may include Early Stone Age lithics as well.
>250 000 to 40 000 years ago	The Middle Stone Age (MSA) is associated with flakes, points and blades manufactured by means of the prepared core technique. This phase is furthermore associated with modern humans and complex cognition (Wadley 2013). As is the case with the Early Stone Age, it is possible that the lithics observed at sites 2829DA 4 and 2829BC 5 comprise Middle Stone Age material.
40 000 years ago to c. 1800s	The Later Stone Age (LSA) is the third archaeological phase identified and is characterised by an abundance of very small stone tools known as microliths as well many rock art sites across the country. This period is associated with hunter-gatherers (San) as well as early pastoralists (Khoekhoe), Within the study area and its immediate surroundings, a significant tangible aspect of the Later Stone Age is present in the form of rock shelters, where accumulated middens and rock paintings provide valuable information to archaeologists in attempting to better understand this well known phase in our history. As indicated before, three of the known archaeological sites from within the study area that is listed on the database of the Natal Museum comprise Later Stone Age rock shelters, of which one also has rock art (Natal Museum Archaeological Database, 2016). Dr. Aaron Mazel, presently of the Newcastle University, carried out extensive archaeological research on the rock shelters of the uKhahlamba-Drakensberg and Biggarsberg areas of the Thukela basin (Mazel & Watchman, 2003). This research project started in 1981, and over the course of the next decade or more, Dr. Mazel studied the history of Holocene hunter-gatherers by way of archaeological excavations on rock shelters in these areas of Kwazulu-Natal. In terms of the Biggarsberg especially, excavated rock shelters include Mgede, Sikhanyisweni, Mzinyashana, Maqonqo and Nkupe (Mazel, 1988 & 1996). Of these, the rock shelter at Nkupe is the closest of these sites to the study area, and is situated on the higher slopes of the south-western end of the prominent hill known as One Tree Hill or Mkupe. Located on the farm Quaggas Kirk, near its boundary with Dagbreek, the site is located no more than a few hundred meters from the study area.

During his research, Dr. Mazel also identified two more rock shelters on the same hill where Nkupe is located. One of these two shelters contained five paintings of humans and the other shelter only one painting (Mazel, 1988). Although the exact location of these two sites are not known, it seems highly likely that they are located within the southern end of the study area.

Dr. Mazel carried out three archaeologicas excavations at Nkupe, during the early 1980s, which established that Nkupe Shelter was "…*one of the key sites for documenting and explaining the Thukela Basin hunter-gatherer Holocene past. It contains probably one of the most complete and detailed 7000-2000 BP sequences known in Southern. Africa, and, in addition, produced a substantial quantity of subsistence and material cultural remains* (Mazel, 1988:321).

Mitchell (1999) states the research of Dr. Mazel in the uKhahlamba-Drakensberg and Biggarsberg areas of the Thukela basin, represented the "most extensive observations" of the Later Stone Age period in the Mixed Woodland Biome of southern Africa. Dr. Mazel's research focussed on the alliance networks between the different hunter-gatherer groups within this area, which revealed that before 4000 BP a single network may have extended through this area, with the Maqonqo Shelter (containing far more ostrich eggshel and seashell ornaments than any of the other sites during this period) identified as of particular significance within this network. The abandonment of Maqonqo coincided with "…*the emergence of three, perhaps four, smaller social regions, each associated with a distinct set of assemblages. Backed microlithic assemblages at sites in the Ndaka social region, for example, are dominated by segments, those in the Toleni region by backed points and blades (although segments still occur), and those in the Injasuthi region by backed points and blades without segments*." (Mitchell, 1999:169).

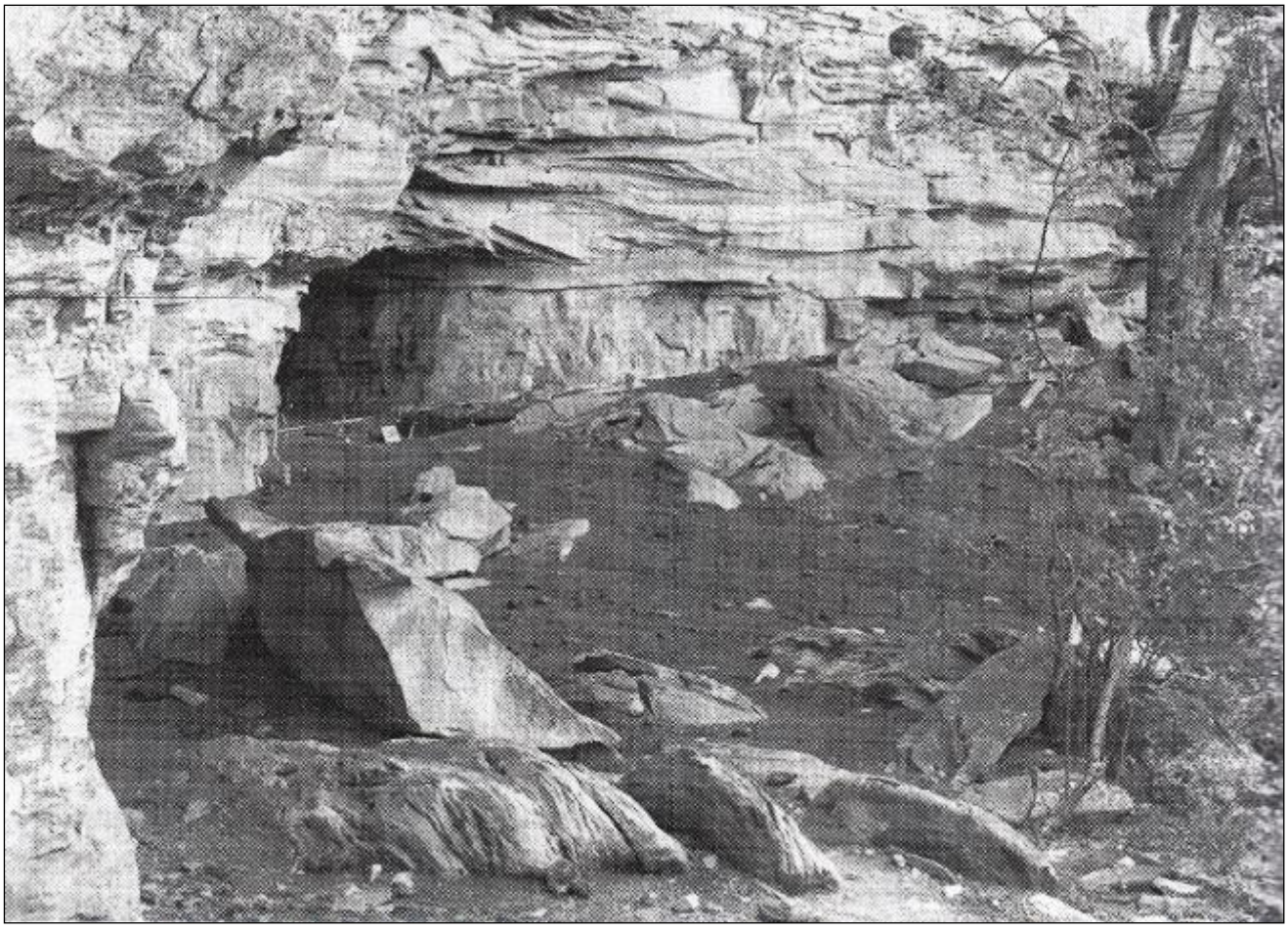

Figure 5 –Nkupe Shelter during the archaeological excavations of the early 1980s (Mitchell, 1999:168).

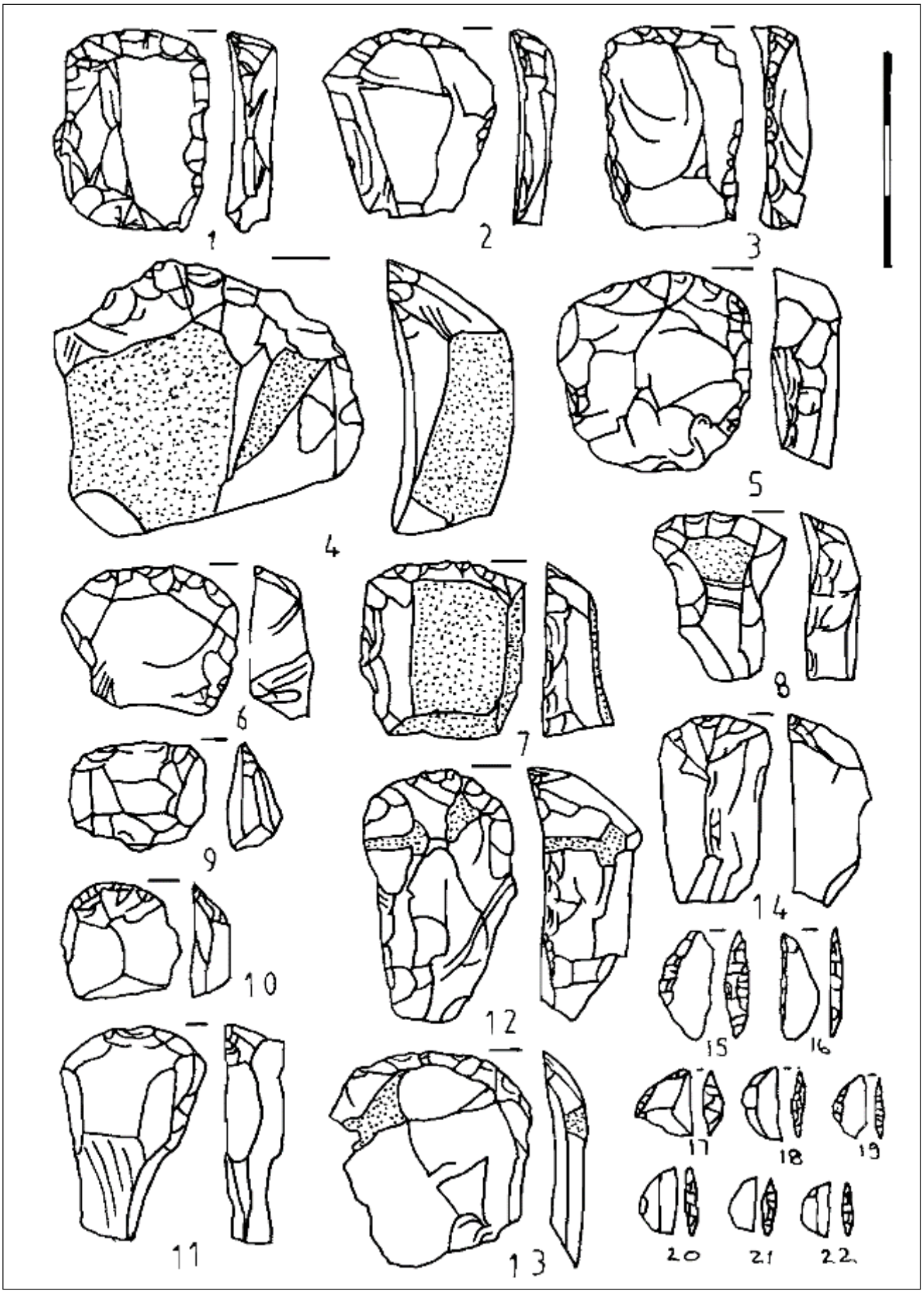

Figure 6 –Scrapers and backed pieces excavated from Nkupe Shelter (Mazel, 1988:341).

The Study Area during the Iron Age	
The arrival of early farming communities during the first millendium, heralded in the start of the Iron Age for South Africa. The Iron Age is that period in South Africa's archaeological history associated with pre-colonial farming communities associated with agricultural and pastoralsit farming activites, metal working, cultural customs such as lobola as well as the tangible representation of the significance of cattle imprinted on their settlement layouts (known as the Central Cattle Pattern) (Huffman, 2007). Although the earliest phase of this period (known as the Early Iron Age) already started in AD 200 in certain sections of Southern Africa, its arrival in the general surroundings of the study area would only have commenced in AD 1350, during the early stages of the Late Iron Age (Huffman, 2007).	
AD 1350 – AD 1750	Ongoing research in KwaZulu-Natal has focused on the second phase of the Blackburn sequence, known as Moor Park. During the fourteenth century, the Moor Park farmers were the first to colonize the higher altitude grasslands of South Africa's interior. In doing so, they opened up possibilities for greater economic specialization and interdependence, not least because of the impossibility of smelting iron where suitable fuel was lacking. The same lack of timber also encouraged the adoption of stone as a building material (Mitchell and Whitelaw, 2005). The Moor Park facies of the Blackburn Branch of the Urewe Tradition is associated with pottery characterised by punctates, rim notching and appliqué (Huffman, 2007).
c. 1500	During this period, black Nguni-speaking peoples started populating the area today known as KwaZulu-Natal. Documents dating to as early as 1550 indicate that these farming communities had generally uniform customs and language (Van Jaarsveld, 1998). In the words of John Laband: "*After about AD 1500 the evidence indicates that the Iron Age people of the Natal-Zululand region were culturally, linguistically and physically the direct ancestors of today's black population, and that their distinctive Nguni-speaking culture had developed within their own region*" (Laband, 1995:13).
Early 1800s	According to an undated archival map which depicts the distribution of Black groups between the Drakensberg Mountains and the Indian Ocean during the early nineteenth century, three main groups appear to have occupied the study area and its surroundings, namely the amaBhele, amaZizi and abakwaMiya (National Archives, Maps, 3/1631 I). To the north, just outside the study area, the Hlubi kingdom was located with the abaMkulise to the south-east. While the information contained on this map may not be absolutely accurate, it does provide a window, scratched or tinted as it may be, into the pre-Mfecane history of the study area and surroundings. In terms of the amaBhele, Bryant (1929) describes their area of settlement before the start of the Mfecane as enclosed by the Biggarsberg as well as the Klip and Tukela rivers. Similarly, Wright and Mazel (2007) indicates that during the early 1800s a number of Bhele chiefdoms were located between the present-day towns of Ladysmith and Dundee. From these descriptions it is clear that at the time, at least a component of the present study area was settled by the amaBhele. In terms of the Zizi, Wright and Mazel (2007) also indicate that they were living along the foothills of the Drakensberg areas, between the upper regions of the Klip (Mnambithi) and Busmans (Mtshezi) rivers, during this time. The land of the amaZizi would therefore have been located to the west of that of the amaBhele, and potentially small sections of the western and south-western ends of the study area may have formed part of the Zizi land. However, if the information contained on the archival map is taken as accurate, a significant component of the study area would have falled in the land of the abakwaMiya. Some references suggest that this group formed part of the Mbehle (Bird, 1965).

	Further to the east and south-east, kingdoms and groups such as the Ngwane, Ndandwe, Mtethwa and Zulu were also located at the time. As will be shown below, especially the first and last of these groups would still have a significant role to play in the history of the study area and its surroundings.

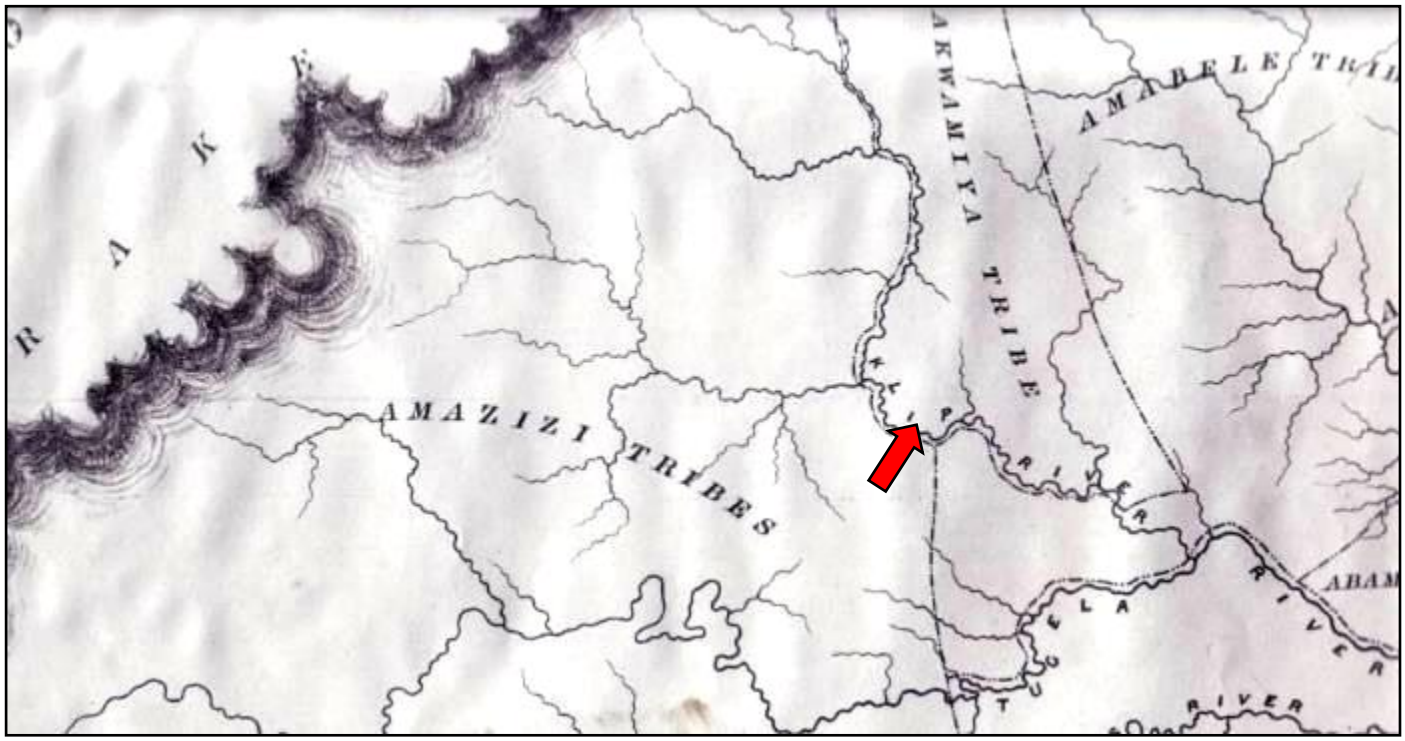

Figure 7 – Detail view of the undated archival map which depicts the distribution of black groups within the study area and its surrounding landscape (National Archives, Maps, 3/1631 I). The position of Ladysmith is shown.

1818 – c. 1848	Certainly one of the more significant individuals during the initial years of the Mfecane in terms of the study area and surroundings, was Matiwane of the Ngwane. Matiwane originally stayed along the White Umfolozi river, which is to the north-east of the study area (Peires, 1995) (Wright, 1995). He was attacked by Zwide of the Ndwandwe, after which he fled in a western direction where they attacked the amaHlubi, immediately north of the present study area. This attack took place in 1818, during the reign of the Hlubi leader Mthimkhulu, and started a period in the history of the Hlubi that is known as *izwekufa* – the destruction of the nation. In this period, the amaHlubi were attacked and defeated by the amaNgwane of Matimane. In the words of Houston & Mbhele (2011:103), the Hlubi "…*were driven away from their land and deprived of their cattle and food. Mthimkhulu was killed. The consequence of this event was the dispersal of the tribe to different areas like the Transkei, the Orange Free State and the Transvaal. Many people hid in caves and forests where there was very little food*." With time, Matiwane and his amaNgwane swerved in a south-western direction and crossed over the Biggarsberg, which as mentioned before formed one of the historic geographical boundaries of the Bhele chiefdoms. Matiwane subsequently continued in a south-western direction, and finally reached the Tukela river valley. Matiwane and his amaNgwane later established themselves in the vicinity of the present Bergville, from where they attacked and usurped the Zizi and Bhele groups along the foot of the Drakensberg mountains. While some of these groups fled southward, others submitted to Matiwane's rule. The Ngwane soon had a paramountcy dominating the Thukela river area (Wright, 1995). In terms of the study area, Peires (1995) indicates that at some point during this time, Matiwane and his amaNgwane stayed in proximity to present-day Ladysmith where they encountered Zizi and Hlubi groups.

Meanwhile, these years also saw the rapid growth of the once small subordinate clan named Zulu, and its early rulers Shaka kaSenzangakhona (c. 1787 – 22 September 1828) and Dingane kaSenzangakhona (c. 1795 – 1840) (see for example Laband, 1995).

During the reign of Shaka, largely peaceful relations were maintained between the Zulu and Hlubi kingdoms, however, with other groups less so. It was in fear of King Shaka that Matiwane of the amaNgwane, decided to abandon his settlements in the study area and surroundings to flee across the Drakensberg (Bryant, 1929).

After the assassination of King Shaka on 22 September 1828, he was succeeded by his half-brother Dingane kaSenzangakhona. The coronation of Dingane as the new king of the Zulu, provided an opportunity for Matiwane to cross back over the Drakensberg mountains and re-establish themselves at their former settlements near present-day Ladysmith. However, he was summoned to King Dingane's capital uMgungundlovu near present-day Ulundi and executed at a small hill outside the Zulu settlement. This hill saw many more executions during King Dingane's rule, including the killing of Piet Retief and his Voortrekkers deputation and was known as KwaMatiwane (the Place of Matiwane) (Lock & Quantrill, 2002).

The presence of Matiwane and the amaNgwane within the study area, is still commemorated in the names of three farms from this area, namely Matowaans Kloof 1063, Matuanas Hoek 1182 and Matowaans Kop 1393. As will be shown below, the early Voortrekker parties moving through the area also refer to 'Kaptein Matowan' who resided near Ladysmith at the time. However, the available historic information suggest that the Ngwane ruler would already have been assassinated by the time that the first Voortrekker parties crossed over the Drakensberg Mountains.

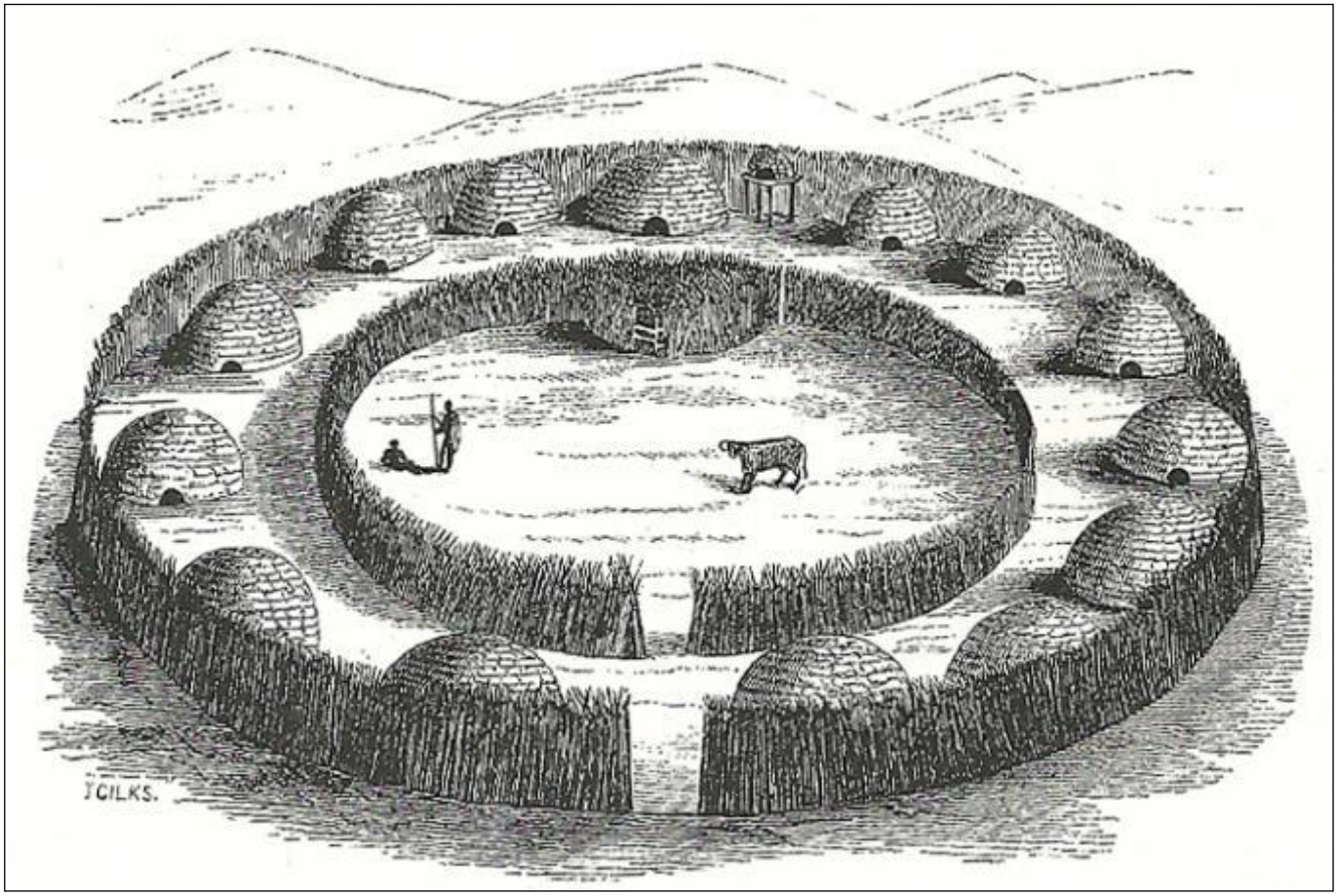

Figure 8 – A nineteenth century depiction of a typical Zulu umuzi (homestead) (Reader's Digest, 1994:81).

The Early Colonial Period	
The early Colonial Period within the study area and surroundings was characterised by the arrival of white people on a permanent basis in the area. This commenced with the establishment of a trading station at Port Natal by six Englishmen in 1824. Furthermore, during the 1830s a mass migration of roughly 2 540 Afrikaner families (comprising approximately 12 000 individuals) from the frontier zone of the Cape Colony to the interior of Southern Africa took place. These people were later to be known as Voortrekkers (those who travel ahead) and formed part of the first mass movement of whites into the interior of Southern Africa (Visagie, 2011). The arrival of white people, with a long-term view of occupation and settlement, into the lands of established kingdoms such as the Zulu, led to a period of conflict, which eventually led to the destruction of the Anglo-Zulu War of 1879. This period also saw the first establishment and surveying of formally proclaimed properties and farms within the study area.	
1837 - 1838	The first Voortrekker parties crossed over the Drakensberg Mountains in 1837. While the events associated with the arrival and early activities of Voortrekkers would have a significant impact on the wider region as a whole, these events occurred some distance away from the present study area. For instance, the two passes used by the Voortrekkers (known today as Retief's Pass and De Beer's Pass) are located 48.8 km to the west and 15.9 km to the north-west respectively. Furthermore, the first laagers established by the Trekkers in present-day Kwazulu-Natal are roughly 31 km from the study area. Similarly, the Battle of Blood (Ncome) River is located roughly 59.6 km north-east of the study area. In all likelihood, the nearest events of this period to the present study area would have been the movement of the Voortrekker parties and commandoes from their laagers situated further to the south to the Zulu Kingdom to the north-east, with a place by the name of Danskraal of special significance for the study area. Danskraal has been suggested as historically significant due to two main reasons, the first of which is that during the trek of the so-called *Wenkommando* under Commandant Andries Pretorius en route to what would become known as the Battle of Blood (Ncome) River (16 December 1838), the commando appears to have camped here in December 1838, and although some historic debate has taken place regarding the historic accuracy of the Voortrekker Vow as well as the exact geographic locality where the Vow was first declared, some historians suggest that in fact this historic event took place at the Voortrekker camp at Danskraal (Spies, 1983) (De Jongh, 1987). The second historic association with Danskraal, and the event which gave it its name, occurred in 1840 when the Voortrekker commando known as the *Beestekommando* or Cattle Commando, while camped here, received a force of 200 Ngwane warriors sent by Matiwane to assist the Voortrekkers with their attack on Dingane. The warriors performed a dance in front of the Voortrekker Commando, which led to the naming of the place (Spies, 1983). In view of the historic information provided above, it seems doubtful for the amaNgwane ruler Matiwane to still have been alive when the Voortrekkers travelled through the area. The reason for this is that the available historic information suggests that Matiwane was killed by Dingane in c. 1830. It seems possible that the Voortrekkers actually met Matiwane's son, namely Zikhali, who, in accordance with Nguni custom, would have been named Zikhali kaMatiwane. Based on this, it would appear that it was Zikhali, and not his father Matiwane, who offered to assist the Voortrekkers's Cattle Commando of 1840. The relatively recent killing of his father by Dingane would certainly have given Zikhali enough reason to exact revenge on the Zulu monarch. Eleven years later, in 1851, the farm Danse Kraal 1020 was surveyed and proclaimed immediately north of Ladysmith in apparent recognition of the historic events of the place. A significant portion of this farm falls within the present study area. During the Centenary Celebrations of the Great Trek in 1938, a monument was erected on the outskirts of Ladysmith, on a portion of the farm Danse Kraal.

Figure 9 – Depiction of an oxwagon crossing a river during the Great Trek (Reader's Digest, 1994:116).

1839 – 1843	With the trader settlement of Port Natal recently been destroyed by Dingane and the threat of the Zulu monarch destroyed during military actions in 1838 and 1840, the Voortrekkers established the Republic of Natalia. Two towns were established by them during this time as well, namely Pietermaritzburg (named after Piet Retief and Gert Maritz) and Congella (in the vicinity of the present-day Durban) (Laband, 1995).
1842	In 1842, after short hostilities which included the Battle of Congella and the Siege of Durban, Captain Smith with a force of 300 men occupied Port Natal (Henderson & Pay, 1939). On 31 May 1844 the territory was formally annexed to the Cape Colony (Erasmus, 2014). In 1845 the first Lieutenant-Governor, Martin West, was appointed (Erasmus, 2014) (Henderson & Pay, 1939).
1847 - 1848	After the British annexation of the Voortrekker Republic of Natalia, many of the remaining Voortrekkers in present-day Kwazulu-Natal departed to the Transorangia as well as to the north of the Vaal River. The remaining 40 or so Voortrekker families still living in Natal, decided to establish a new Voortrekker republic known as the Klip River Republic in proximity to the present-day town of Ladysmith. On 7 January 1847 a treaty was signed between the Voortrekkers and the Zulu monarch, Mpande kaSenzangakhona for the former to acquire the land located between the Buffalo River in the north and the Tukela River in the south for a price of 1,000 *Rijksdaalders*. Seven years before, the Voortrekkers and Mpande had joined forces to defeat Dingane, and Mpande was crowned as Zulu king in 1840 as a result (www.wikipedia.org). One of the men at the forefront of the negotiations with the Zulu monarch, was well-known Voortrekker leader Johannes Hendrik (Hans Dons) de Lange, who some sources suggest had enjoyed a personal friendship with Mpande (De Villiers, 2012). The Klip River Republic had only a short existence, and was annexed by Great Britain in 1848 (Erasmus, 2004).
1848	During the reign of Mpande (1840 – 1872), the relations between the Zulu and Hlubi worsened to such an extent that the Hlubi king Langalibele moved his people soutward to the surroundings of present-day Estcourt and requested protection from the Colonial Authorities in Natal. Ironically, less than thirty years after their move into the colonial fold, the Hlubi was involved in a bitter war with the colonial authorities (Wright & Mazel, 2007).

20 June 1850	The town of Ladysmith was proclaimed on 20 June 1850. The original intention was to name the town Windsor for a local trader by the name of George Windsor, however as the proclamation date for the town grew closer, the decision was made to rather name the town in honour of Juana Maria de los Dolores de Leon, the Spanish wife of the Governor of the Cape Colony, Sir Harry Smith (Erasmus, 2004).
1850s	During the 1850s a number of the farms from within the study area were surveyed by *inter alia* George Moodie, Charles Tebbut Bell and G.D. Greaves. The largest number of these farms appear to have been surveyed during 1851 and 1852 (Surveyor General of South Africa).

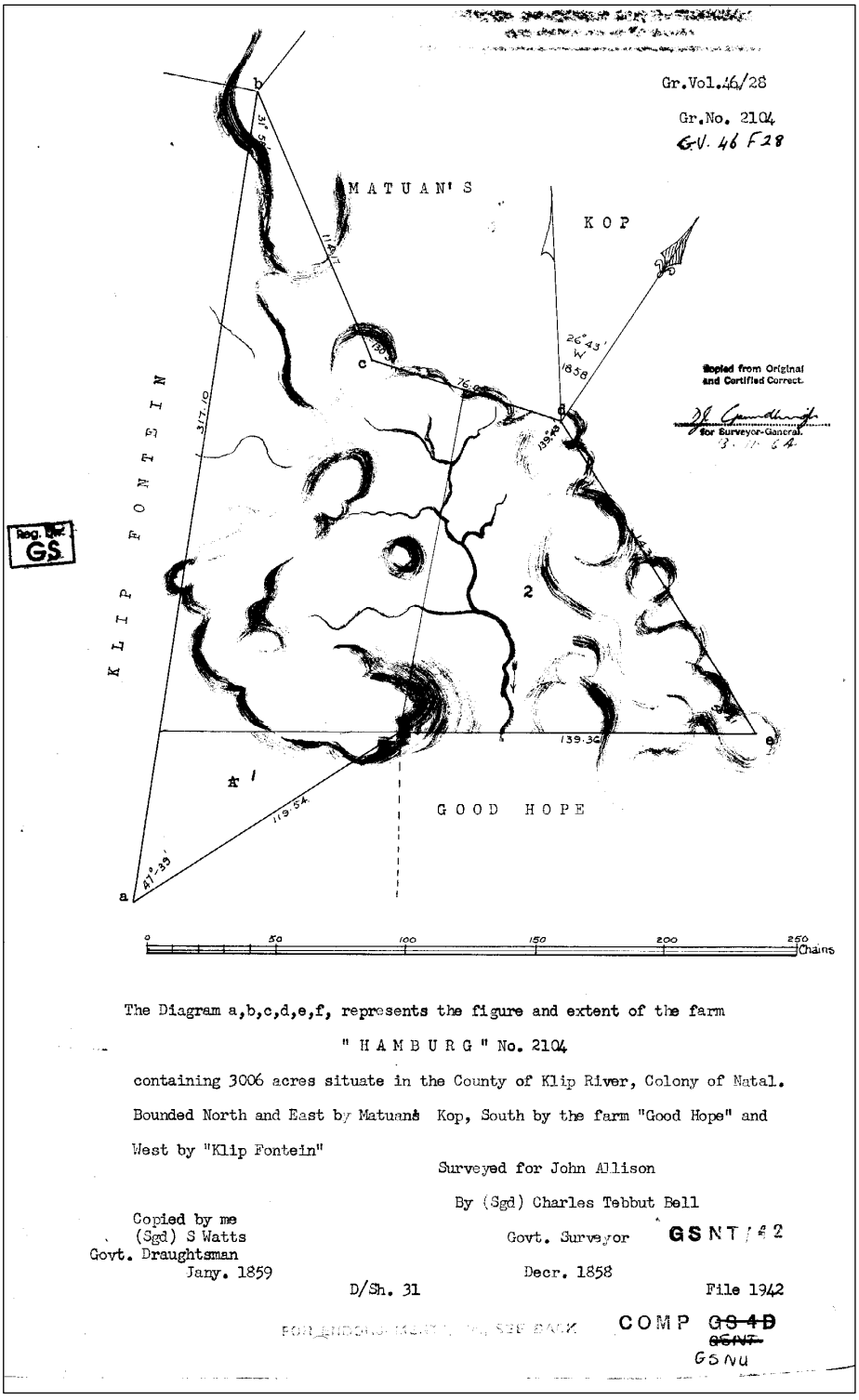

Figure 10 – An example of one of the early survey diagrams for the farm Hamburg located within the study area. The farm was surveyed by Charles Tebbut Bell in December 1858 for the property's first owner, John Allison (Chief Surveyor-General of South Africa).

26 March 1861	After the energetic events of the 1830s and 1840s for which he became famous, Voortrekker leader Johan Hendrik (Hans Dons) de Lange settled down on his farm Valsfontein, near Newcastle. Here, in December 1860 he killed a black man named Ncatiya "…*in circumstances that were never properly clarified*…" (Laband, 2009:61). Following this incident, De Lange was arrested to stand trial for murder in Ladysmith. The court found De Lange guilty of murder, and he was hanged in Ladysmith on 26 March 1861. Johan Hendrik de Lange was buried on the farm of his son-in-law, Izak van Niekerk. In 1955 a monument was erected at the grave (Federasie van Afrikaanse Kultuurvereniginge, 1980). The grave of Hans Dons de Lange is located within the present study area, on the farm Rooival 1101. The execution of Hans Dons de Lange caused extensive outrage among the Voortrekkers and their descendants still living in Natal in that they believed that the Ladysmith court never fully investigated the matter. The fact that De Lange was executed for killing a black man also played a role in the feeling of outrage.
Figure 11 – Johan Hendrik (Hans Dons) de Lange with his wife Catharina Cornelia Lombard (Visagie, 2011:135).	
The Anglo-Zulu War (1879)	
1879	The Anglo-Zulu War was fought between Great Britain and the Zulu of King Cetshwayo kaMpande. After an initial Zulu victory at Isandlwana (22 January 1879), the tide turned in favour of the British and eventually led to the Battle of Ulundi (4 July 1879) where the Zulus were defeated and King Cetshwayo's capital destroyed (Knight, 2002). The closest battle to the study area is Rorke's Drift (22 – 23 January 1879), located roughly 59 km to the east. However, during the war a fort was built at Ladysmith to protect the residents of the town in case of a Zulu attack (Erasmus, 2004). Ladysmith was not attacked during the war.

The Transvaal War (1880 – 1881)	
The Transvaal War followed shortly on the Zulu War, was fought between Great Britain and the South African Republic, and followed on the British Annexation of the Transvaal in 1877. The nearest prominent battles of the war are located some distance to the north, including Laing's Nek (28 January 1881), Schuinshoogte (8 February 1881) and Amajuba (26 February 1881), where incidentally, the British commander Major-General Sir George Pomeroy Colley was also killed. After the rout at Amajuba (75 km north of the study area), the British government decided to sue for peace. An armistice was signed on 6 March 1881, and an official peace agreement on 23 March 1881 at O'Neil's cottage on the slopes of Amajuba. It is clear that the events outlined above were far located from the present study area. However, the immediate surroundings of the study area possess some significance relating to the war. After the British rout at Amajuba on 26 February 1881, and before the official peace agreement of 23 March 1881, a number of events took place which can be directly associated with the immediate surroundings of the study area.	
Late January - Mid February 1881	From late January to early February 1881, large numbers of British reinforcements landed at Durban. These reinforcements were under the command of Colonel Sir Evelyn Wood, and within a short spate of time started moving from Durban to Newcastle and the front. The route that Wood's column used was the so-called old road between Durban and Newcastle, which crossed the Biggarsberg Mountains at Mkupe Pass, a short distance to the east of the northern end of the study area. In an attempt to halt the arrival of unwanted reinforcements, the commanding officer of the Transvaal forces, General Piet Joubert, ordered General Nicolaas J. Smit to occupy the Mkupe Pass with a large body of mounted men in an attempt to stop the reinforcements from passing through. Upon realising the extensive size of Wood's column, however, he ordered the withdrawal of Smit from the pass. General Smit managed to abandon the pass just before the arrival of the first of the reinforcements on their way to Newcastle and arrived back at Joubert's laager on 18 February 1881.

Figure 12 –General Nicolaas J. Smit (www.karoo-southafrica.co.za) and Colonel Sir Evelyn Wood (www.wikipedia.org).

Early March 1881	The events surrounding the occupation of Mkupe Pass by General Smit must have played on Sir Evelyn Wood's mind, for shortly thereafter he ordered that a line of forts be built all along the road from Ladysmith to Newcastle. These forts, aimed at defending the strategically significant arterial lifeline along which supplies, ammunition and men had to be pumped, were also to be used as signal stations for easier communication between the front and Durban. Forts were subsequently erected at Sunday's River, Mkupe, Dannhauser, Ingagane and Newcastle. None of these forts were built within the study area; however, the forts at Mkupe and Sundays River were located the closest. Built on a knoll known as One Tree Hill, the fort at Mkupe would later became known as Fort Mistake (due to a cartographic error made in 1910 and for a number of years thereafter, when the names of the two hills here were swopped around with the hill west of the road mistakenly named One Tree Hill and the one to the east Mkupe Hill) and is located 4.9 km east of the study area (www.talana.co.za).
	*Figure 13 – This depiction of the construction of Fort Mistake was made by C.E. Fripp of The Graphic in early March 1881. It shows the fort in the foreground with a tented camp of the British unit building the fort visible in the lower background. In the middle background, Mkupe Hill, located just outside the study area, is clearly visible (www.talana.co.za).*
Middle March 1881	A group of Free State Burghers crossed over the Drakensberg from the Free State Republic into Natal and established their laager at Leeuwkop directly opposite Mkupe Hill. Fearing an imminent attack, the British mounted heavy guns on the buttress of Mkupe Hill. The British also erected a stone redoubt overlooking the transport road with a large wooden stockade above it on the flat summit of Mkupe Hill (www.talana.co.za). It would appear that the stone redoubt was built on a lower point with the wooden stockade built above it for defensive support. This fort was named Fort Mkupe after the hill on which it was erected. Incidentally, Mkupe is an isiZulu word which means "Eagle's Nest" (www.talana.co.za), with the fort known as Fort Eagle's Nest as well. An interesting historical fact about Fort Mkupe, is that it was commanded by Colonel Buller, who as General Sir Redvers Buller, would command the entire British Army during the first months of the South African War. The details of the battle between the Free State burgers and the British at Mkupe Pass are not known, except that the attack of the Free State Boers proved unsuccessful and that the battle lasted for an entire day. Significantly, the battle represents the last action of the war. Based on information that is presently available, Leeukop appears to be 23 km northwest of Mkupe Hill. This would suggest that the placement of heavy guns on Mkupe Hill would have been done on the buttress that extends from Mkupe Hill in a north-western direction. While the location of the wooden stockade positioned on the flat summit of Mkupe Hill is reasonably well defined, the position of the stone redoubt less so. Nonetheless, the positions of the gun emplacements, stone redoubt and wooden stockade (if evidence of these still exist) would all be less than 2 km from the present study area boundaries. Furthermore, the attack of the Free State burgers would have taken them around the northern end of the study area to Mkupe Pass which is roughly 3 km from the study area.

Figure 14 – This depiction of Fort Mkupe by C.E. Fripp of The Graphic is titled "Fort Eagle's Rest, Biggarsberg" and was made during March 1881 (The Graphic, 23 April 1881).

The Study Area during the 1880s and 1890s	
1890	The Maria Ratschitz Mission Station was established in 1890. After Abbott Franz Pfanner of the Trappist Monks heard that a group of African Methodists were intending to sell their communal farm Telapi, in the Biggarsberg Mountains, he decided to make an offer for the farm, that was 3 228 hectares in extent. Abbot Pfanner bought the farm and renamed it Maria Ratschitz (Brain, 1982). The mission station is located 7.3 km east of the study area.
January 1890	During the 1880s, the Natal Government decided to extend the railway line between Durban and Pietermaritzburg further to the north. In June 1886 the line reached Ladysmith, and Elandslaagte by April 1889 (Hocking, 1995).

The South African War (1899 – 1902)

The South African War was fought between the Boer Republics of the Transvaal and Free State on the one side and the Great Britain on the other. It is known as the South Africa War as the victims and participants of the war were not excluded to British or Boer alone.

A number of historically significant events and battles from within the study area occurred during the war. These include the battles of Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (which formed part of an assault on Lancer's Hill) (3 & 4 November 1899) and the British raid on the Boer gun position at Surprise Hill (10 & 11 December 1899). Sections of the Siege of Ladysmith (2 November 1899 – 27 February 1900) also occurred within the study area, with the Boer positions at Rifleman's Ridge, Lancer's Nek, Telegraph Ridge, Thorneyhill Ridge, Surprise Hill and Pepworth Hill all located within the study area.

These battles and events are outlined in some detail in the section that follows and as a result will not be discussed any further in this historic overview.

The Twentieth Century

From the mid-twentieth century onward, the government's efforts to implement the system of Apartheid would have its effects within the study area as well and the focus was placed on a number of the historic settlements from within the study area which the Apartheid government wanted to forcibly relocate. A brief outline of the respective individual histories of these settlements will be discussed below.

6.2 The South African War and the Study Area

6.2.1 The Siege of Ladysmith (1 November 1899 - 27 February 1900)

The first battle of the South African War in present-day KwaZulu-Natal occurred at Talana Hill, outside Dundee on 20 October 1899. This battle followed on the declaration of war on 11 October 1899 and the invasion of the Natal Colony by the forces of the Transvaal and Free State Republics. On 21 October 1899, a second battle took place when a Boer force near Elandslaagte station was attacked by a British contingent from Ladysmith, the British took the Boer position and retreating Boers were slaughtered in the subsequent British cavalry charge. Despite the British victory at Elandslaagte, the victorious British forces there as well as the garrison at Dundee were ordered to withdraw towards Ladysmith (Von Der Heyde, 2013).

Figure 15 – The garrison of Dundee marches through muddy terrain to Ladysmith after the Battle of Talana Hill (Von der Heyde, 2013:156).

On 24 October 1899, the safety of the British force en route from Dundee to Ladysmith became threatened by a strong Boer position held by Free State Commandos on the farm Rietfontein, a short distance north-east of Ladysmith. The position held by the Boer forces overlooked the road and railway line leading into Ladysmith, and threatened the advance of the British garrison from Dundee. As a result, British forces from Ladysmith were ordered to attack the Free Staters and in this way enable the British coloum from Dundee to reach Ladysmith safely (Von Der Heyde, 2013). These events are known as the Battle of Rietfontein, and is largely located within the study area.

In an attempt to prevent the Boer forces from surrounding and taking Ladysmith, the officer in command of Ladysmith, Sir George White, ordered an attack on Pepworth Hill and Long Hill in the direction of Modder Spruit to the east and a simultaneous attack on Nicholson's Nek north of Ladysmith. The Battle of Ladysmith (also individually known as the

Battles of Modderspruit and Nicholson's Nek) took place on 30 October 1899. The attack at Modderspruit was repulsed while the one at Nicholson' Nek resulted in the surrender of the British force (Von Der Heyde, 2013).

The Boers closed the circle around Ladysmith and thus the formal siege of Ladysmith commenced. The siege was characterised by artillery bombardments from both sides. On the Boer side, no less than four of the famous Long Tom cannons were stationed on positions outside Ladysmith and took part in the siege.

Figure 16 – Two scenes from inside Ladysmith during the siege. On the left, an artist's impression of the moment a Long Tom shell struck the Ladysmith Town Hall. Below, one of many Birtish soldiers from inside Ladysmith during the siege proudly displaying their unexploded Long Tom shells picked up from town (Changuion, 2001:35 & 46).

Figure 17 – The Long Tom known as Klapperkop Tom on Middle Hill, south-west of Ladysmith (Changuion, 2001:29).

During the siege, the British raided Boer artillery positions and succeeded in damaging the Long Tom on Gun Hill (east of the study area) and a Howitzer on Surprise Hill. On 6 January 1900 a determined Boer attack was launched on Platrand (Wagon Hill), south-west of Ladysmith. The Boer generals believed that a successful taking of this hill would mean the end of the siege, thereby allowing the forces besieging Ladysmith to reinforce the commandoes preparing for a battle along the Tugela. The Battle of Platrand lasted from the early hours of the morning until late that afternoon when a thunder storm gave the Boers cover to withdraw. This was the last attempt by the Boers to take the town.

The siege continued until the British breakthrough at Pieter's Hill during the Battle of Tugela Heights (14 – 27 February 1900) which allowed for the final relief of Ladysmith by a column under Lord Redvers Buller on 27 February 1900 and the long-awaited ending of the siege (Von Der Heyde, 2013).

Of all the battles discussed in this section, only the action on Surprise Hill as well as the attack on Pepworth Hill took place within the study area. These battles are discussed in the next section. The siege itself, however, also had a significant role to place within the study area. During the research undertaken for the present study area, the maps of the siege published in a number of different references were assessed, including the ones by Todd & Fordham (1980), Changuion (2001) and Gillings (1999). These maps all show similar layouts and positions, with only small differences between some of them. All these maps were studied for the purposes of recording the Boer positions on the sensitivity maps, however the map published in Gillings (1999) proved to be most useful in the recording of these positions as well as the recording of the Boer siege lines. A copy of this map was obtained from the Military History Museum of South Africa in Johannesburg.

From north-east to west, the Boer positions located within the study area are Pepworth Hill, an Unknown Ridge west of Pepworth Hill, Surprise Hill, Thornhill Kop, Telegraph Ridge, Lancer's Nek and Rifleman's Ridge. The latter ridge is partially located within the study area. According to Changuion (2001), the following can be said about these positions:

- Pepworth Hill: The Long Tom known as Schanskop Tom was placed on this hill between 29 October and 30 November 1899. A 12 pounder was also positioned on the same hill. The headquarters of the Transvaal forces and camp of General Piet Joubert was positioned behind Pepworth Hill, on the farm Rietfontein.
- Unknown Ridge: A 12 pounder was positioned here. The Johnnesburg Police was positioned between this ridge and Surprise Hill.
- Surprise Hill: A 4.7 Howitzer was emplaced on this hill. Below this ridge, on its south-eastern end, an 8-inch mortar was positioned. The focus of the attack on Surpise Hill on 11 December 1899 was the Howitzer positioned there.
- Thornhill Kop: One 12 pounder and two 37 mm artillery pieces were emplaced on top of this ridge. The Pretoria Commando held this area.

- Telegraph Ridge: Two 12 pounders were emplaced on this ridge. The Winburg and a section of the Kroonstad Commandos were occupying this position. Furthermore, the headquarters of the Free State forces and camp of its commanding officer, Commandant Prinsloo, was located behind this ridge.
- Lancer's Nek: Seemingly held by the Bethlehem and Vrede Commandos.
- Rifleman's Ridge: One 9 pounder was positioned here. Another section of the Kroonstad Commando was positioned at the ridge.

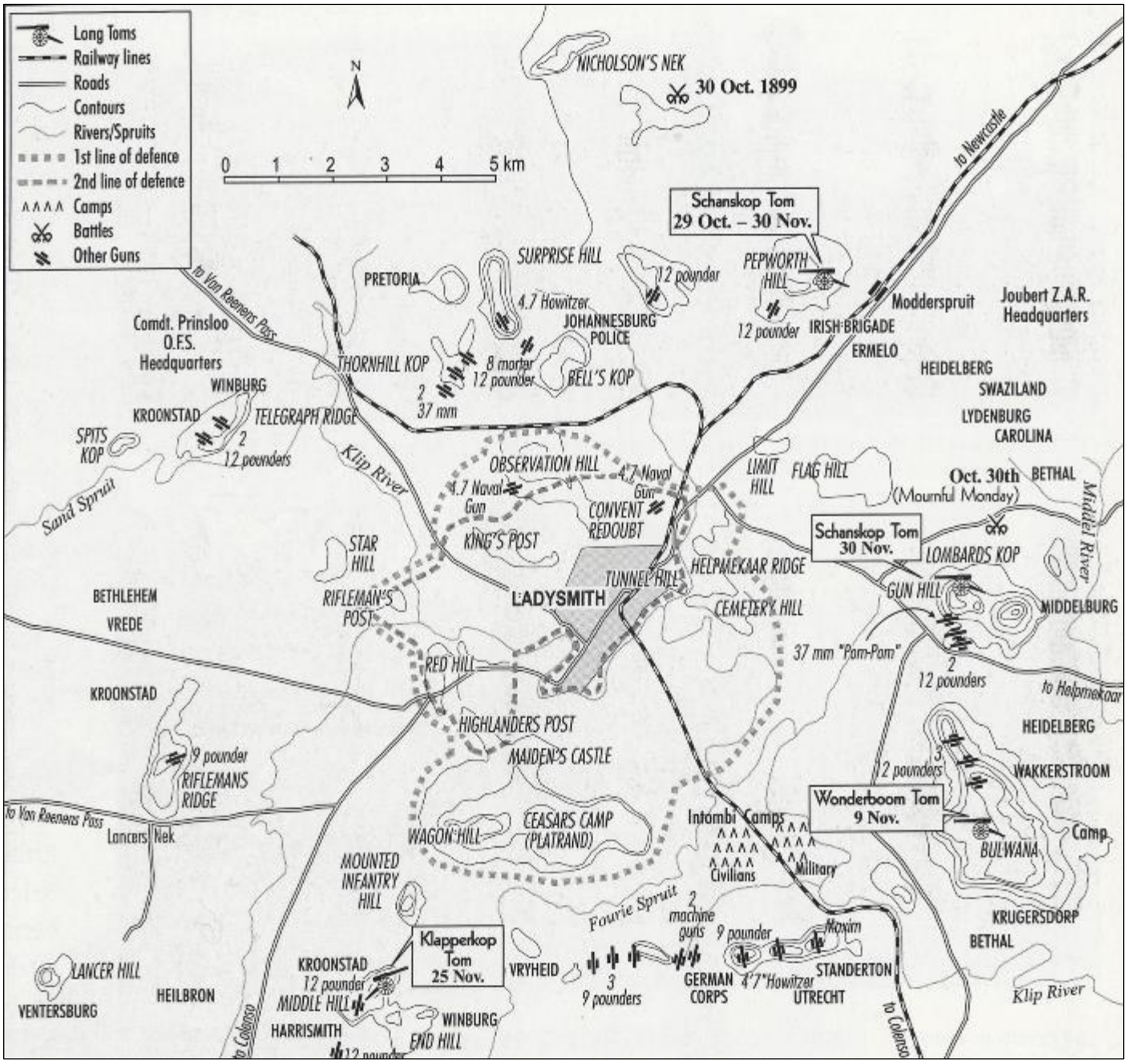

Figure 18 – Layout plan of the siege of Ladysmith (Changuion, 2001:30).

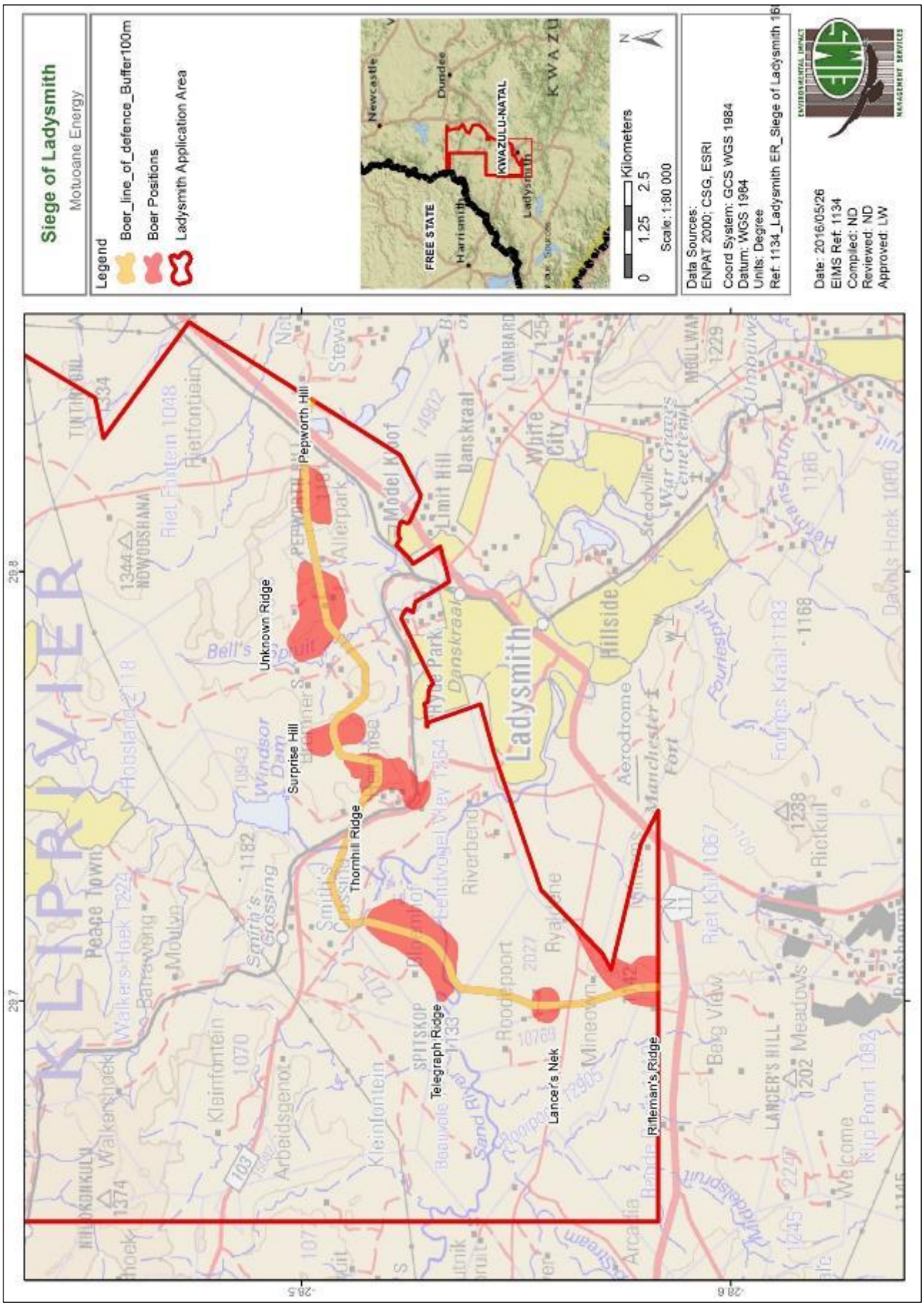

Figure 19 – Map depicting the components of the Siege of Ladysmith (2 November 1899 – 27 February 1900) that are located within the study area. The orange polygons depict the known Boer positions from within the study area during the siege while the yellow line show the approximate position of the Boer siege line.

6.2.2 Battlefields and Skirmishes from within the Study Area

6.2.2.1 Introduction

During the historical background research for the present study, only battlefields and skirmishes associated with the South African War (1899-1902) could be identified within the present study area. Furthermore, these actions can all be associated with the first few months of the war.

6.2.2.2 The Battle of Rietfontein (24 October 1899)

After the Battle of Talana Hill (located near Dundee some distance outside of the study area) on 20 October 1899, the commanding officer Colonel Henry Yule withdrew from Dundee under orders from General Sir George White at Ladysmith. A Boer force of 1,000 men comprising members of the Free State commandos of Harrismith, Vrede and Winburg then occupied a line of ridges on the farm Rietfontein which overlooked the railway line and road leading out from Ladysmith to Dundee. This force was commanded by General Andries Cronjé and its officers included Christiaan de Wet, who as the commander of the Free State forces during the last two years of the war would become world famous. The Boer forces holding the position at Rietfontein possessed one Krupp gun that was placed on the eastern side of a prominent ridge known as Tinta Nyoni Mountain. This latter mountain was occupied by members of the Kroonstad and Winburg Commandos, while the Harrismith Commando occupied a ridge to the west known as Ndwatshana Hill.

Upon hearing of the strong Boer position, General White realised the threat posed to the safety of the Dundee garrison under Colonel Yule which had to march past the Boer positions to reach Ladysmith. As a result, on 24 October 1899 White marched out of Ladysmith along the road to Dundee with a strong force of 5,300 men comprising the 5th Lancers, 19th Hussars, Border Mounted Rifles, Devonshire Regiment, Gloucestershire Regiment, Imperial Light Horse, King's Royal Rifle Corps, Liverpool Regiment, Natal Carbineers and the Natal Field Artillery.

The 5th Lancers advanced at the fron of the British force, and although being fired upon from the Boer position at Tinta Nyoni Mountain, decided to push ahead to strengthen the right flank of General White's attack where more Free State commandos occupied the ridges. As the main force under General White marched into range, the single Boer Krupp gun commenced firing, barely missing White and his officer staff. Two batteries of artillery immediately swung to the left and after crossing the railway line returned fire at the Krupp gun from a distance of 4,500m. The Krupp gun was subsequently hit and withdrawn.

With the threat of the Boer artillery abated, the British infantry advanced on Tinta Nyoni and successfully reached the southern crest. General White's objective of pushing the Boer forces away from the road was satisfactorily achieved

at a low cost to men. However, inexplicably, Colonel E.P. Wilford of the Gloucestershire Regiment then ordered a charge across the summit of the ridge, which led to a high loss of life.

At the same time, the Kroonstad Commando on the Ndwatshana Hill located west of Tinta Nyoni saw an opportunity to outflank the attacking infantry, and moved south from their position. Their flanking movement was stopped by the Natal Carbineers.

By the same afternoon General White had withdrawn his force to Ladysmith and Colonel Yule's column passed to the east of the railway. As a result of the efforts of General White, the Free State commandos were not able to attack Yule's column, which proceeded safely to Ladysmith (Breytenbach, 1969) (Changuion, 2001) (Von Der Heyde, 2013).

The map of the battlefield that was published in Breytenbach (1969) was primarily used to establish the location of the battle in relation to the study area. A comparison of this map and an overlay of the First Edition Topographic Sheet on Google Earth Pro revealed that almost the entire battle took place within the present study area.The only components located outside of the study area are the eastern end of Tinta Nyoni Mountain and the position of the 5th Lancers to the east.

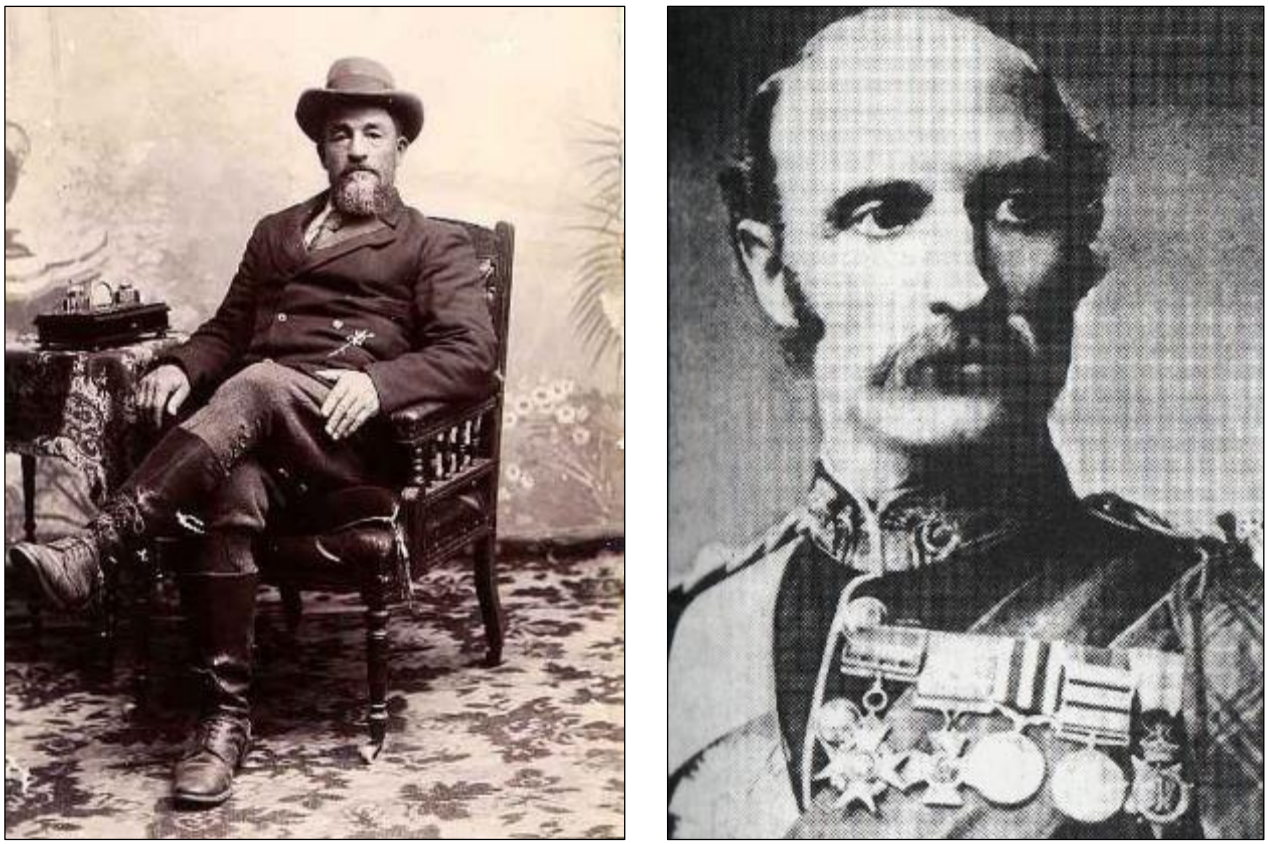

Figure 20 – Two of the prominent officers present at the battle. Left: Vice-Commandant Christiaan de Wet (later General and commander of the Free State forces) photographed shortly after the war (Van Schoor, 2007). Right: General Sir George White, who commanded the British forces at the battle and was also in command of Ladysmith during the siege (Changuion, 2001:15).

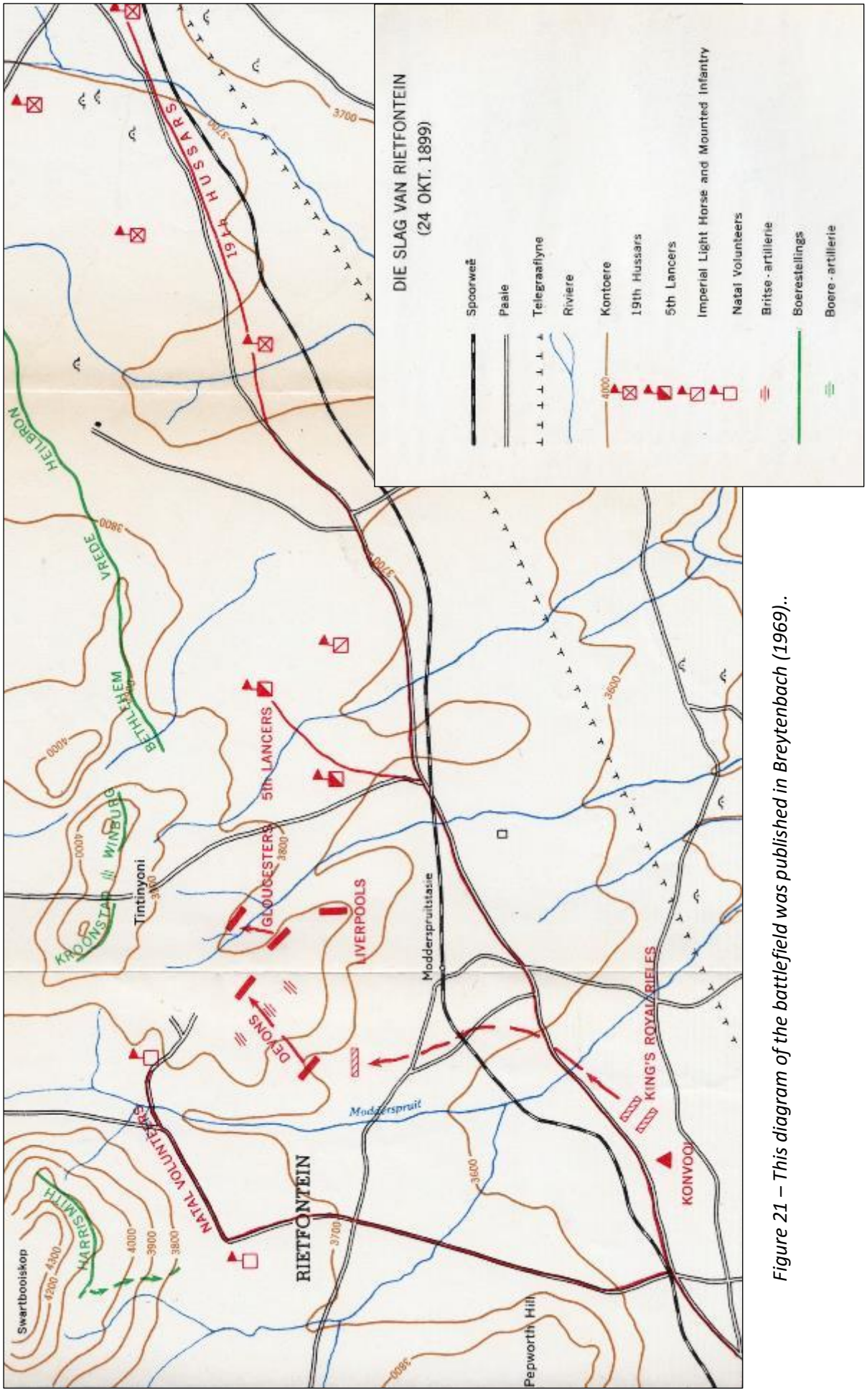

Figure 21 – This diagram of the battlefield was published in Breytenbach (1969)..

6.2.2.3 The Battle of Ladysmith (Modderspruit and Nicholson's Nek) (30 October 1899)

The Battle of Ladysmith of 30 October 1899 was as a desperate attempt by General Sir George White to forcefully stop the Boer armies from surrounding and besieging Ladysmith. The battle comprised two separate actions. The action north-east of Ladysmith was aimed at the Boer positions at Pepworth Hill and Long Hill and the other the occupation of Nicholson's Nek on the road leading north out of Ladysmith. The objective of this latter occupation was to stop the Free State commandos from rushing to the defence of their Transvaal comrades-in-arms at Pepworth and Long Hill, and secondly to prevent the Transvaal forces from successfully retreating from these positions and join forces with the Free State forces north of Ladysmith.

At daybreak, on the morning of 30 October 1899, two British infantry brigades supported by cavalry and artillery units departed from Ladysmith. The objective of Colonel Geoffrey Grimwood in command of one of the infantry brigades was Long Hill, whilst Colonel Ian Hamilton in command of the second infantry brigade was heading for Pepworth Hill. In anticipation of the British attack, General Piet Joubert of the Transvaal forces had ordered that the men and guns be vacated from Long Hill and positioned further to the east. This was achieved before the battle commenced, and without the knowledge of the British. The Boer forces waiting for the British attack from their new position east of Long Hill was commanded by General Louis Botha, who himself would within a few months be promoted to the position of overall commander of the Transvaal forces.

Figure 22 – An unknown artist's impression of the Battle of Modderspruit (Changuoin, 2001:22). Ladysmith town would be to the left of this image with the Boer position on Pepworth Hill, with its Long Tom clearly shown, visible on the right. Officers of the Transvaal State Artillery can be seen to the middle right of the image with a telescope.

With the Boer position at Long Hill already vacated, Colonel Grimwoord experienced no difficulty in taking this position. However, reaching the summit he came under severe attack from General Botha's men on his eastern flank. Only with the assistance of his supporting cavalry was Grimwood able to retreat from Long Hill. Meanwhile, Colonel Ian Hamilton's men had engaged the Long Tom on Pepworth Hill in an artillery duel, and his advance was threatening the position commanded by General Piet Joubert. At this inopportune time, General White, fearing that Hamilton's men were to be outflanked by the Boer forces east of Long Hill, ordered Hamilton to retire back to Ladysmith. With Pepworth Hill no longer under attack, the Long Tom emplaced there was able to freely fire on Hamilton's retreating brigade and caused a number of casualties. Fortunately for the British, a naval long 12-pounder gun had just reached Ladysmith from Durban. This gun was immediately brought into the battle and managed to cover the retreat.

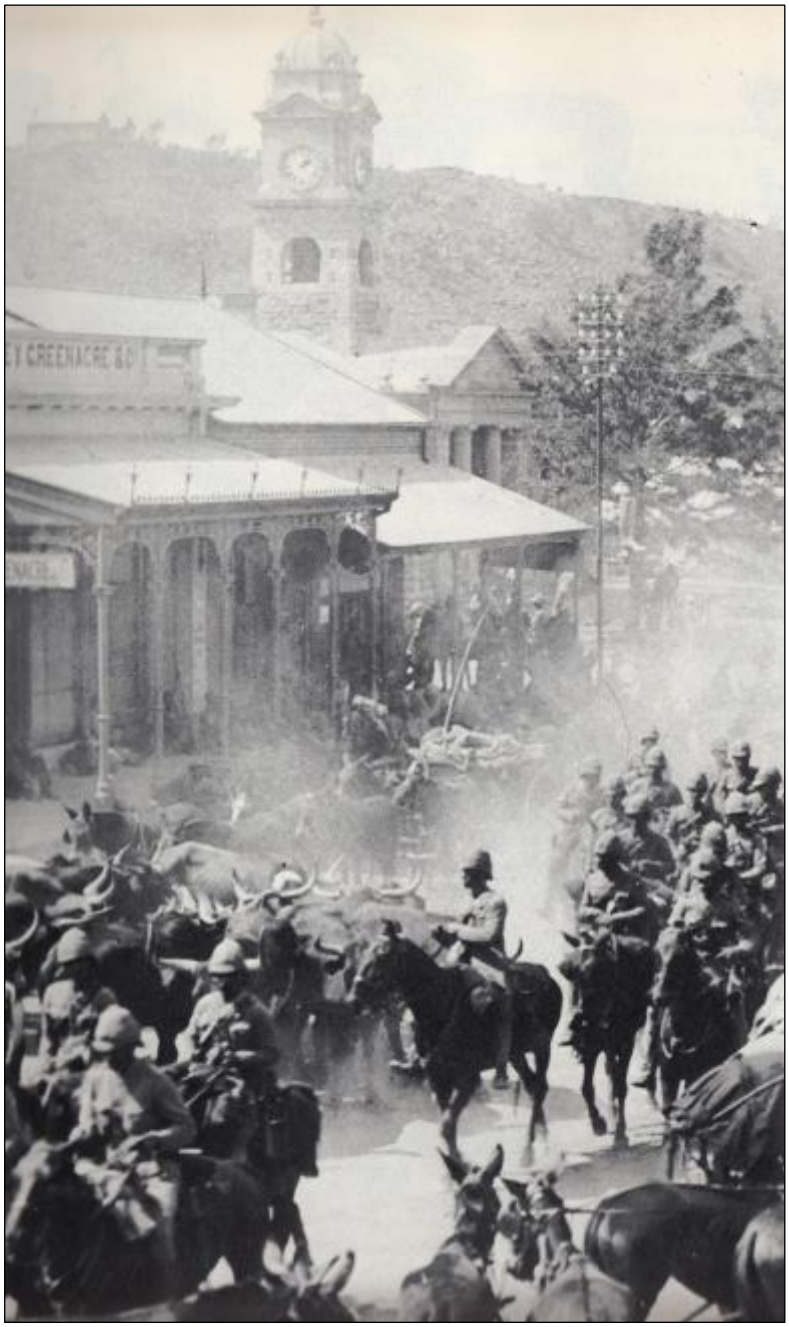

Figure 23 – The photograph on the left represents a cropped view of the arrival of the retreating brigades of Colonels Grimwood and Hamilton in Ladysmith after the Battle of Modderspruit (Pakenham, 1979). One of the men behind the rout of the British attack, namely General Louis Botha, can be seen on the right. As indicated in the text, Botha commanded the Boer forces east of Long Hill (Changuion, 2001:117).

By mid-morning General White realised that the entire battle plan had failed, and sent orders to the force at Nicholson's Neck to retreat back to town. However, unbeknownst to White, his men north of Ladysmith were by this stage already in serious trouble.

The advance on Nicholson's Nek had commenced the evening of 29 October 1899, when a force of 1,100 men comprising the Royal Irish Fusiliers and Goucestershire Regiment supported by a mountain battery and reserve ammunition on mule-drawn carts, departed from Ladysmith. The column fell under the overall command of Lieutenant Colonel F.R.C. Carleton of the Royal Irish Fusiliers. Guided by a local farmer, the column advanced slowly northward and passed in proximity to Bell Spruit. Realising that they were not going to reach Nicholson's Nek by daybreak, Lieutenant Colonel Carleton ordered his men to ascent a flat-topped steep-sided ridge to their left, known as Trenchgula (or Cayingubo) Hill. During the ascent, a Boer sentry on the summit was alterted to the advancing British and after firing towards it, rushed down the hill to find reinforcements. The resulting noise caused the mules to panic and they stampeded down the hill taking essential components of the mountain gun as well as the entire force's spare ammunition with them. With some effort, the officers were able to restore order and the ascent of Trenchgula was continued. At the summit, Lieutenant Colonel Carleton ordered his men to position themselves on the southern end of the ridge and placed the Gloucestershire Regiment on the western flank and the Royal Irish Fusiliers on the eastern flank, overlooking the road leading up to Nicholson's Nek. The northern, western and eastern ends of the position was hastily fortified by stone sangars.

By dawn the expected attack took place. A Boer force of 900 men under the command of Vice-Commandant Christiaan de Wet and Commandant Steenekamp with the Free State commandos and Commandant Van Dam of the Johannesburg Police encircled the mountain and attacked the British position across the higher lying rise from the north. By 11 am the forward defences on this side of the position had been pushed back. Furthermore, after the failed attack north-east of Ladysmith, the Transvaal men from Pepworth Hill and Long Hill were now able to assist the Free Staters and Johannesburg Police and completely surrounded Lieutenant Colonel Carleton's position. Running low on ammunition, and suffering heavy casulaties, the men along the northern end of the British position surrendered. When the message of the surrender was passed to Lieutenant Colonel Carleton further back, he also received the message from General Sir George White of the failed attack north-east Ladysmith. Realising that there would be no hope of retreat or assistance from the two infantry brigades under Grimwood and Hamilton, Carleton burned his maps and papers and instructed his men to surrender. Before surrendering, Carleton sent a message by riders to General White in Ladysmith informing him of the surrender. One of these riders, John Norwood, later received the Victoria Cross for rescuing a fellow messenger who was wounded in the ride back to Ladysmith (Von der Heyde, 2013).

In his official report of the battle, General Sir George White indicated that the losses suffered by his forces during the Battle of Ladysmith were 1,272 officers and men. For all ranks, these numbers comprised 69 killed, 249 wounded and 947 missing. The largest majority of the latter group were taken prisoner by the Boer forces at Nicholson's Nek. The

Boer losses in the battle were 16 killed and 50 wounded (Breytenbach, 1969).

Two days after the Battle of Ladysmith, the railway line south of the town was cut and Ladysmith was entirely besieged. The siege of Ladysmith would last 118 days until 27 February 1900 (Von der Heyde, 2013).

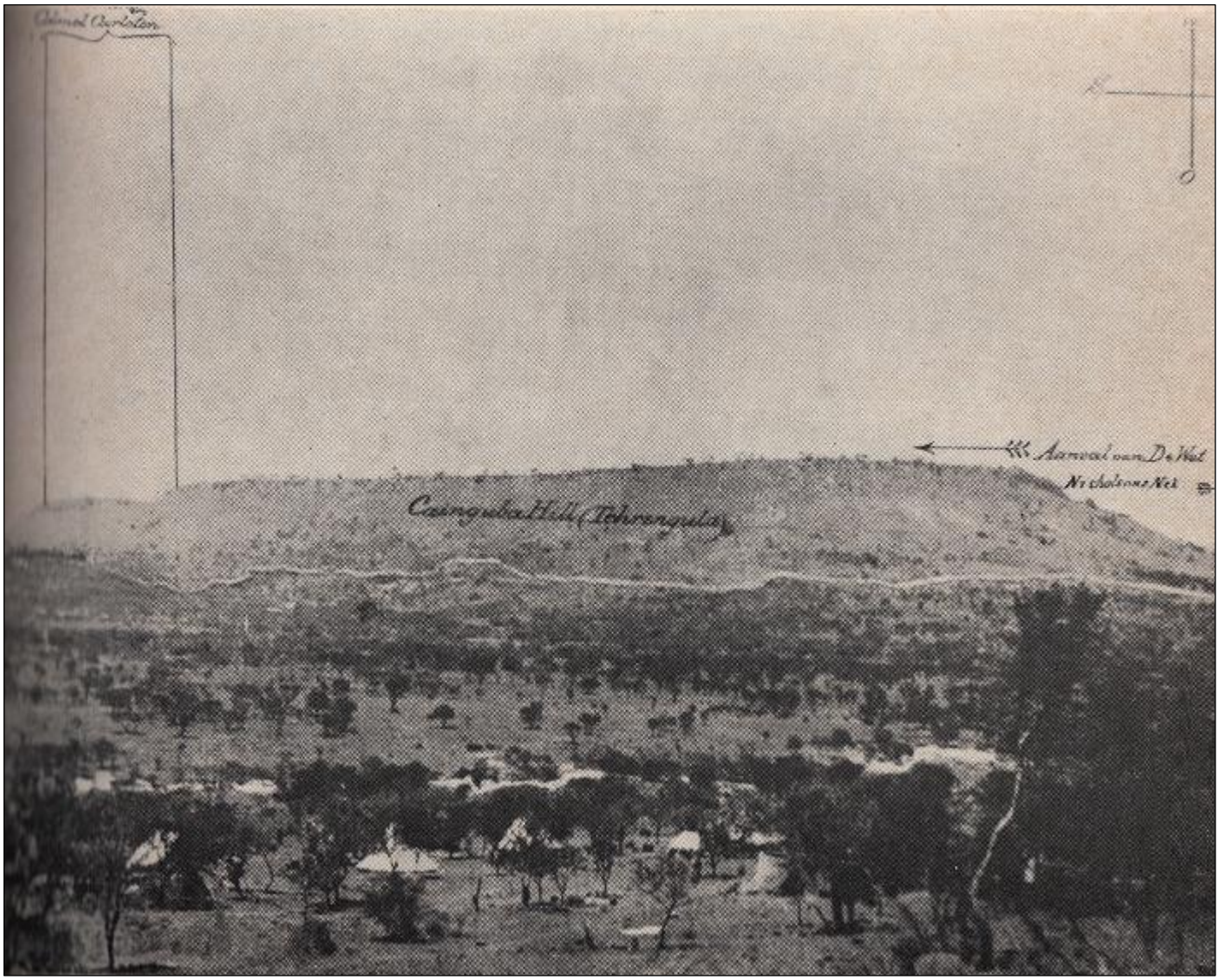

Figure 24 – Contemporary photograph of Trenchgula Hill as seen from the east. The position of Lieutenant Colonel Carleton's men on the southern point of this hill is marked by the two vertical lines on the left. The start of the attack of the Free State forces under Vice-Commandant De Wet is shown by the arrow on the right. The road leading from Ladysmith to Nicholson's Nek can be seen on the lower eastern slope of Trenchgula Hill (Breytenbach, 1969).

The map of the battlefield that was published in Breytenbach (1969) was primarily used to establish the location of the battle in relation to the study area. A comparison of this map and an overlay of the First Edition Topographic Sheet on Google Earth Pro revealed that while almost the entire Battle of Modderspruit took place outside the study area, Pepworth Hill is located within the study area. Furthermore, the entire Battle of Nicholson's Nek is also located within the study area.

6.2.2.4 Actions and battles associated with the Siege of Ladysmith

6.2.2.4.1 Rifleman's Ridge (3 & 4 November 1899)

On 3 November 1899, a British cavalry force comprising sections of the Imperial Light Horse under the command of Major Karri Davies, discovered a strongly held Boer position at Lancer's Hill south-west of Ladysmith. The Boer position was held by the Heilbron Commando under Commandant Steenekamp and Vice-Commandant Christiaan de Wet, the Bethlehem Commando under Commandant Piet de Wet and the Winburg Commando under Commandant Theunissen.

Major Davies requested reinforcements from Ladysmith and a strong British force comprising the 18th and 19th Hussars and 5th Dragoon Guards supported by the 21st Battery of the Royal Field Artillery was sent out from Ladysmith the following morning. The British force combined with the imperial Light Horse of Major Karri Davies, and the combined force fell under the overall command of Major-General J.F. Brocklehurst.

While the British main attack comprising two sections of the Imperial Light Horse were unable to take Lancer's Hill, Brocklehurst's right flank comprising the 18th and 19th Hussars occupied Rifleman's Ridge unopposed. Meanwhile, Brocklehurst's left flank comprising the remaining two sections of Imperial Light Horse had attacked Middle Hil, but was beaten back by a strong Boer counter attack.

Reinforcements in the form of the 42nd and 53rd Royal Field Artillery as well as the Natal Mounted Volunteers were sent by General White from Ladysmith. Supported by the combined artillery fire of the three batteries of the Royal Field Artillery, the 5th Dragoon Guards were able to assist the sections of Imperial Light Infantry to retreat in an orderly fashion from Lancer's Hill whereas the Natal Mounted Volunteers, with some difficulty, were able to assist the remaining sections of Imperial Light Infantry at Middle Hill to do the same.

By late that evening the entire British force had returned to Ladysmith, having suffered a total of 34 casulaties. These casulaties comprised four killed, 29 wounded and one missing. The losses suffered on Boer side were one killed and nine wounded (Breytenback, 1969).

No diagrams or maps of this battle are available. However, only the northernmost component of this battle comprising the occupation of Rifleman's Ridge by the 18th and 19th Hussars is located within the study area.

6.2.2.4.2 Surprise Hill (10 & 11 December 1899)

Only a small number of attacks or raids were made by the British garrison at Ladysmith. The most famous of these is the raid on Gun Hill on the night of 7 on 8 December 1899. During the raid, considerable damage was caused to the

Long Tom (known as the Schanskop Tom) on Gun Hill and a Boer Maxim gun was also captured (Changuion, 2001).

While the events associated with the raid on Gun Hill occurred outside the present study area, the success of the raid provided the stimulus for a second raid a couple of nights later on the 4.7-inch Krupp Howitzer positioned on Surprise Hill, north-west of Ladysmith. Surprise Hill (also known as Vaalkop), and all events associated with this raid, took place within the present study area.

On the evening of 10 December 1899, five companies of the Second Batallion of the Rifle Brigade under command of Lieutenant Colonel Charles Metcalfe moved out of Ladysmith towards Surprise Hill. They were led by two local farmers, Thornhill and Ashby. While some of the Rifle Brigade companies extended to the east and west of Surprise Hill to cover the flanks, the main attacking force ascended the hill as quietly as possible from the front and was able to reach the gun position before their presence became known to the Boers. A vicious hand-to-hand battle ensued around the gun, which resulted in losses on both sides. The men of the Royal Engineers and Royal Artillery who formed part of the raiding party, were then brought from the rear to blow up the Howitzer. Using gun-cotton, the first explosion failed to destroy the gun and alerted many of the Boers on the nearby hills of the raid. A second charge of gun-cotton had to be placed, and after a painstaking delay of some 25 minutes, the gun was successfully destroyed in the second explosion.

Meanwhile, the Boer forces started enclosing the hill from all sides and Colonel Metcalfe instructed his men to fix bayonets and charge down the hill towards Ladysmith. The Rifle Brigade stormed down the hill and reached its foot with little loss of life. However, just before reaching the safety of Ladysmith, their escape was blockedcby a small but determined force from the Pretoria Commando who attempted to cut off the Rifle Brigade's escape by positioning themselves in a donga across the escape route. The skirmish around this donga resulted in a number of casualties on both sides. Incidentally, the small force from the Pretoria Commando included Deneys Reitz, the son of the former State President of the Free State Republic F.W. Reitz and later government minister in the Union of South Africa. The surviving raiders returned safely back to a hero's welcome in Ladysmith (Macdonald, 1900).

While the exact losses on both sides are not presently known, Macdonald (1900) indicates that on British side 11 men had been killed, 43 wounded and six captured. He adds that on Boer side 28 men lost their lives and 23 were wounded.

A monument to the raid and fallen Rifle Brigade members was erected by the raid survivors shortly after the relief of Ladysmith. Later, this monument was vandalised. A new monument, in honour of the fallen on both sides, was built and officially opened in 2009. See for example the blog of Robin Smith for more information on the raid as well as these monuments (http://surprisehill.blogspot.co.za/2012_02_01_archive.html).

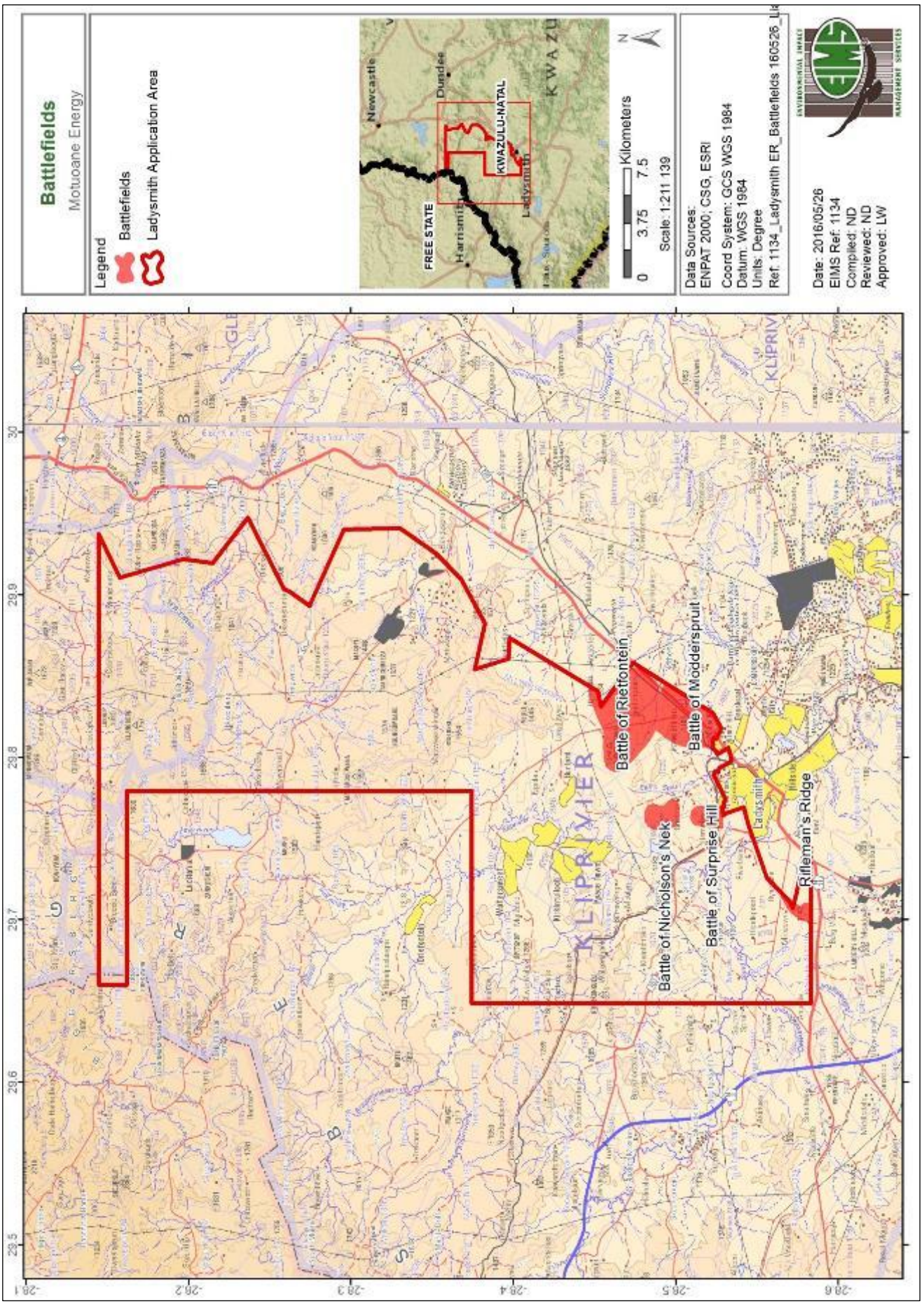

Figure 25 – Map depicting the known battles from within the study area. These battles are all associated with the South African War (1899-1902).

6.3 Cemeteries obtained from the Genealogical Society of South Africa Database

The Genealogical Society of South Africa has a list of cemeteries as recorded by its members and other volunteers. The cemeteries listed on this database are recorded on Google Earth, and this was used to establish whether any of the cemeteries contained on this database is located within the present study area. As a result, it was established that four of these cemeteries are located within the study area (www.genza.co.za).

Table 4- List of cemeteries as depicted on the Genealogical Society of South Africa Database.

CEMETERY NAME	COORDINATES	COMMENTS
Rooival	S 28.394033 E 29.733000	Fenced farm cemetery at Watersmeet which includes the grave of Voortrekker leader Johan Hendrik (Hans Dons) de Lange who was executed by the British Colonial government on 26 March 1861 after being convicted of killing a black person. Two large rectangular cement lined areas associated with the De Lange grave seem to suggest that more graves are located here.
Arcadia	S 28.568000 E 29.650008	Three graves of military interest.
Mielietuinhoek	S 28.231667 E 29.926417	Farm cemetery containing 14 graves.
Up George	S 28.219000 E 29.896367	Farm cemetery containing 4 graves.

Figure 26 – The cemetery at Rooival where Voortrekker leader Hans Dons de Lange is buried (www.genza.co.za).

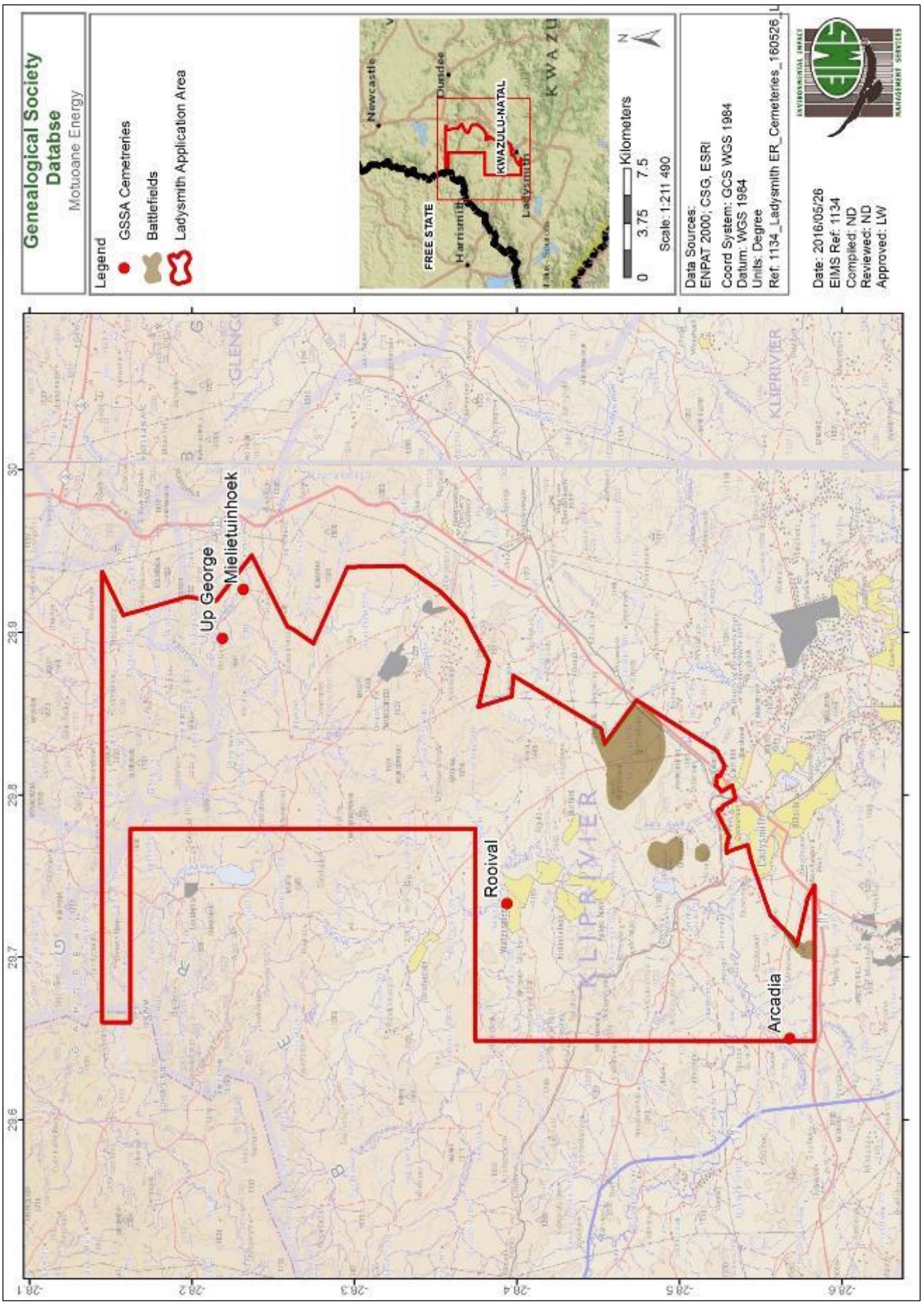

Figure 27 – Map depicting the cemeteries listed on the database of the Genealogical Society of South Africa that are located within the study area.

6.4 Examination of Archival and Historic Maps

Maps obtained from the Directorate: Surveys and Mapping in Cape Town were used to compile a historic layering of the study area and at the same time also to provide augmentative information to the identified heritage sites. Overlays were made on Google Earth. This allowed for the recording of GPS coordinates for each depicted feature and also to assess the position of these map features in relation to heritage sites identified during the present study. Due to the massive extent of the study area, it proved impractical to include all possible heritage features such as farm buildings, and farm worker accommodation in this study. As a result, and for the purposes of this study, all points marked as graves and cemeteries are included. This does of course not mean that the historic farmsteads or farmworker houses are not necessarily of no heritage importance.

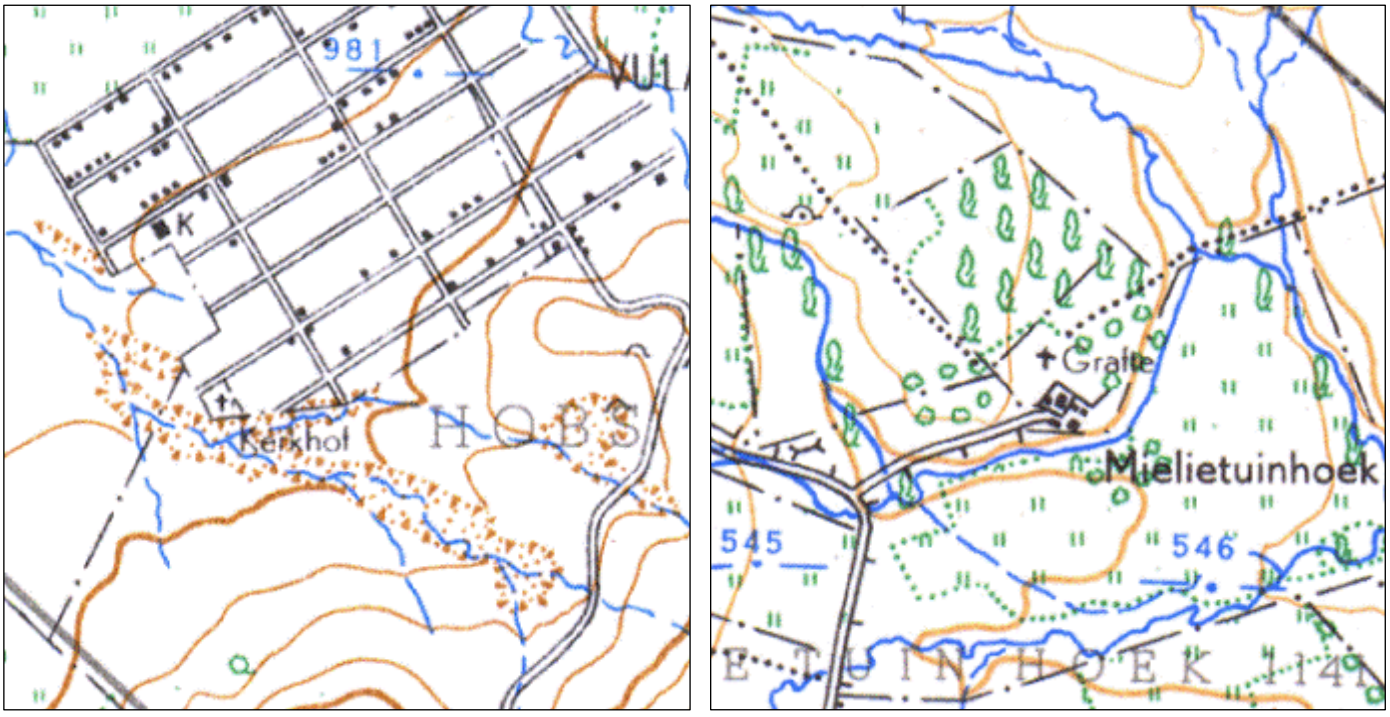

Figure 28 – Examples of cemeteries depicted on the First Edition topographical sheets. On the left a section of the 2829BD Topographical Sheet that was surveyed in 1962 is shown. The depicted cemetery is included in this report as FEM Site 14. On the right, a section of the 2829BB Topographical Sheet that was surveyed in 1958. The depicted cemetery is included in this report as FEM Site 18.

6.4.1 First Edition of the 2829DA Topographical Sheet

In this section the First Edition of the 2829DA Topographical Sheet will be discussed. This map sheet was based on aerial photography carried out in 1945, was surveyed in 1954 and drawn in the Trigonometrical Survey Office in 1956. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table below.

Table 5- List of sites depicted on the First Edition of the 2829DA Topographic Sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 1	Map only	S 28.567540 E 29.649729	A cemetery is depicted on the map. The cemetery is associated with a feature identified on the map as "An Old Stone Fortification". A polygon was drawn around this feature to mark its position on the sensitivity maps.
FEM Site 2	Map only	S 28.558511 E 29.655225	An "Ou Klipskans" is depicted here, which means 'Old Stone Breastwork'. A polygon was drawn around the feature to mark its position on the sensitivity maps.
FEM Site 3	Map only	S 28.540765 E 29.732164	A cemetery is depicted on the map. The cemetery may be associated with the South African War (1899-1902).
FEM Site 4	Map only	S 28.525401 E 29.683636	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.

6.4.2 First Edition of the 2829DB Topographical Sheet

In this section the First Edition of the 2829DB Topographical Sheet will be discussed. This map sheet was based on aerial photography carried out in 1945, was surveyed in 1953 and drawn in the Trigonometrical Survey Office in 1957. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table below.

Table 6- List of sites depicted on the First Edition of the 2829DB Topographical sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 5	Map only	S 28.529194 E 29.763669	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 6	Google Earth	S 28.520253 E 29.765774	A monument is depicted on the map. Using Google Earth, a small white rectangular feature was identified a short distance away. This point was used to mark the position of the monument. The monument in question is the Rifle Brigade Monument and plaque commemorating the British Raid on Surprise Hill on 10 and 11 December 1899.

6.4.3 First Edition of the 2829BD Topographical Sheet

In this section the First Edition of the 2829BD Topographical Sheet will be discussed. This map sheet was based on aerial photography carried out in 1944, was surveyed in 1962 and drawn in the Trigonometrical Survey Office in 1963. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table below.

Table 7- List of sites depicted on the First Edition of the 2829BD Topographical sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 7	Map only	S 28.486845 E 29.771427	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used. From the Google Earth imagery, it seems possible that the cemetery was relocated for the construction of a road. However, this is not certain at present.
FEM Site 8	Map only	S 28.482323 E 29.824751	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 9	Map only	S 28.479845 E 29.828279	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used. This cemetery is one of the places that was used to bury the individuals who were killed in the nearby Battle of Rietfontein (24 October 1899).
FEM Site 10	Map only	S 28.473970 E 29.822478	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 11	Map only	S 28.467761 E 29.833408	A grave is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 12	Map only	S 28.458058 E 29.813595	A grave is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 13	Map only	S 28.455072 E 29.809645	A grave is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.
FEM Site 14	Google Earth	S 28.464691 E 29.755243	A cemetery is depicted on the map. Using Google Earth, a number of white grave-like features were identified a short distance away. These features were used to mark the position of the cemetery.

FEM Site 15	Google Earth	S 28.357568 E 29.880516	A cemetery is depicted on the map. Using Google Earth, what appears to be a very large cemetery was identified. A polygon was drawn around this feature to mark its position on the sensitivity maps.
FEM Site 16	Google Earth	S 28.334053 E 29.901781	A cemetery is depicted on the map. Using Google Earth, what appears to be a large cemetery was identified. A polygon was drawn around this feature to mark its position on the sensitivity maps.
FEM Site 17	Map only	S 28.254359 E 29.796110	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used.

6.4.4 First Edition of the 2829BB Topographical Sheet

In this section the First Edition of the 2829BB Topographical Sheet will be discussed. This map sheet was based on aerial photography carried out in 1944, was surveyed in 1958 and drawn in the Trigonometrical Survey Office in 1960. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table below.

Table 8- List of sites depicted on the First Edition of the 2829BB Topographical sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 18	Google Earth	S 28.231627 E 29.926343	A cemetery is depicted on the map. Using Google Earth, a rectangular enclosure was observed a short distance away. This enclosure was used to mark the position of the cemetery.
FEM Site 19	Google Earth	S 28.171179 E 29.819024	An “Old Fort” is depicted on the map. Using Google Earth, a structure was observed a short distance away. This feature was used to mark the position of the site. It is not presently certain to which period in the history of the study area this forticiation belongs. However, the site was most likely built during the Transvaal War (1880-1881) or South African War (1899-1902).

6.4.5 First Edition of the 2829BA Topographical Sheet

In this section the First Edition of the 2829BA Topographical Sheet will be discussed. This map sheet was based on aerial photography carried out in 1955, was surveyed in 1964 and drawn in the Trigonometrical Survey Office in 1965. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table.

Table 9- List of sites depicted on the First Edition of the 2829BA Topographical sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 20	Map only	S 28.158925 E 29.663239	Brandon's Pass over the Drakensberg is depicted here. This pass has a strong association with the South African War and was used as a crossing point over the mountain range during the war. Blockhouses were also built in this area during the latter stages of the war by the British forces to stop the movement of Boer commandoes over the pass. The pass as depicted on the map was recorded as a path on Google Earth for inclusion on the sensitivity maps.

6.4.6 First Edition of the 2829BC Topographical Sheet

In this section the First Edition of the 2829BC Topographical Sheet will be discussed. This map sheet is dated to 1963. The cemeteries, monuments and military sites depicted within the study area on this map sheet are listed in the table.

Table 10- List of sites depicted on the First Edition of the 2829BC Topographical sheet

SITE NUMBER	CONFIRMATION	COORDINATES	COMMENTS
FEM Site 21	Map only	S 28.394464 E 29.734590	A cemetery is depicted on the map. No clear indications for a cemetery could be found on Google Earth, and as a result the map depiction was used. The grave of Voortrekker leader Johan Hendrik (Hans Dons) de Lange forms part of this cemetery.

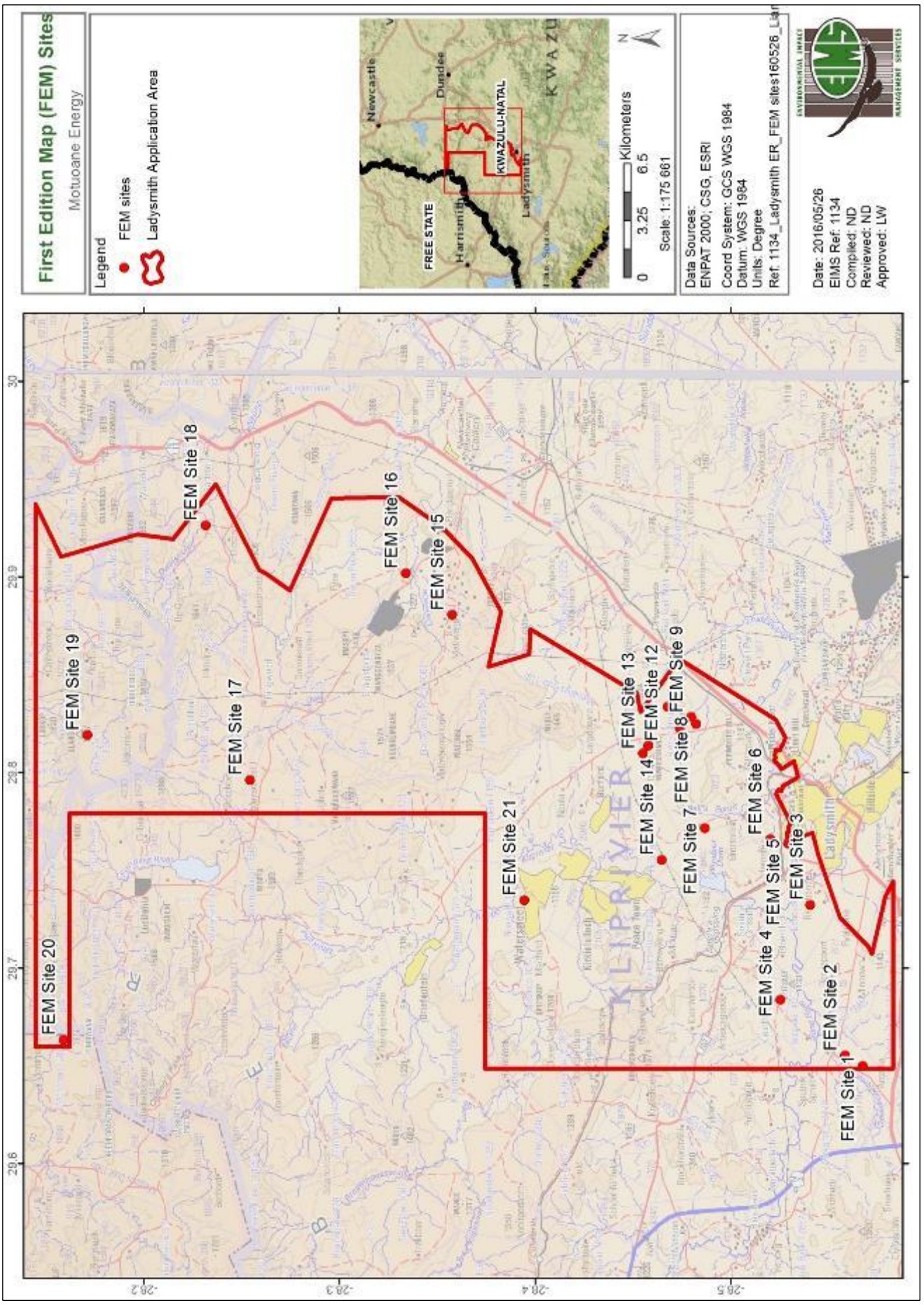

Figure 29 – Map depicting the sites identified from the First Edition Topographical Map Sheets. All these sites from within the entire study area are shown.

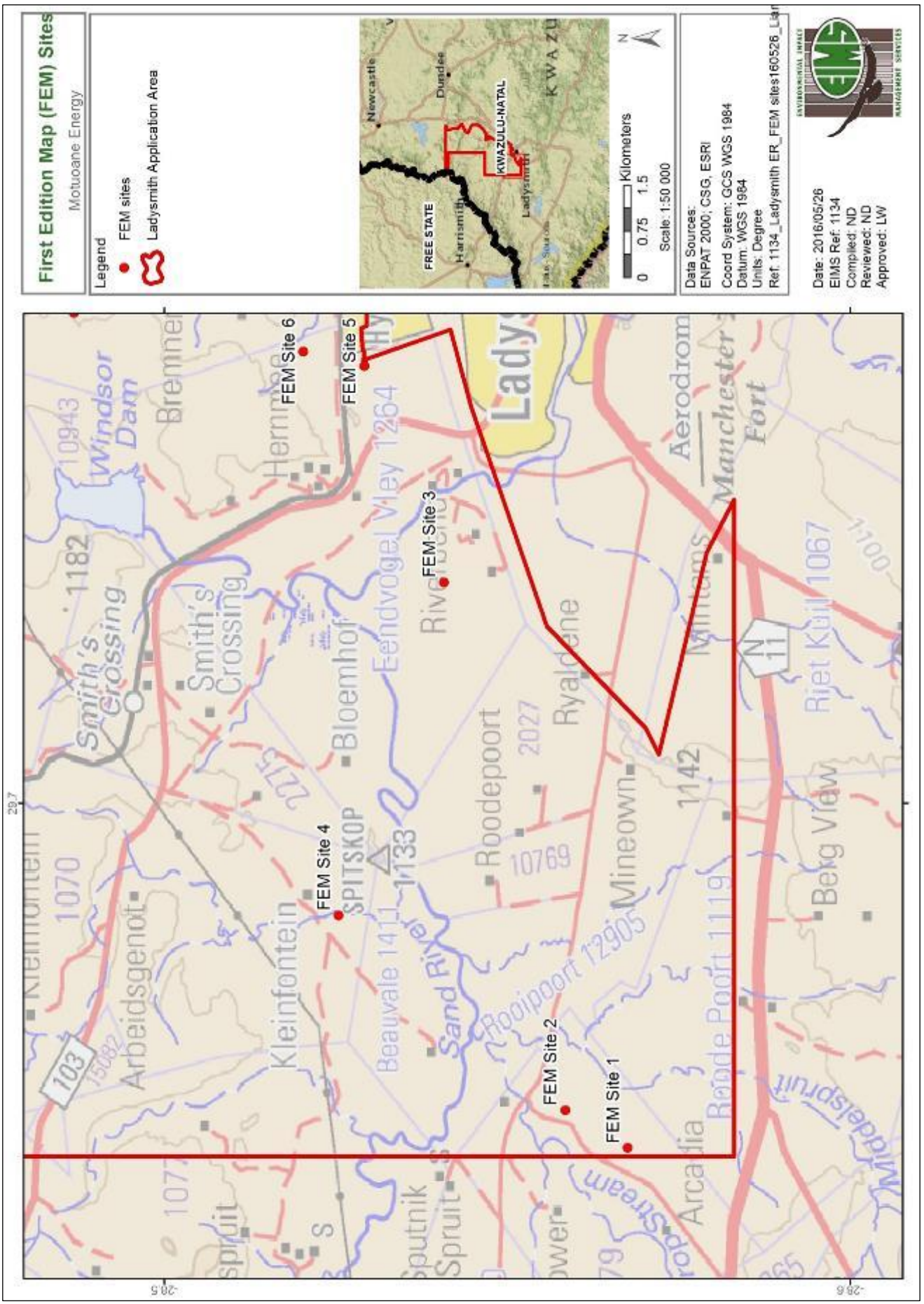

Figure 30 – Map depicting a closer view of the south-western end of the study area, showing the sites identified from the First Edition Topographical Map Sheets.

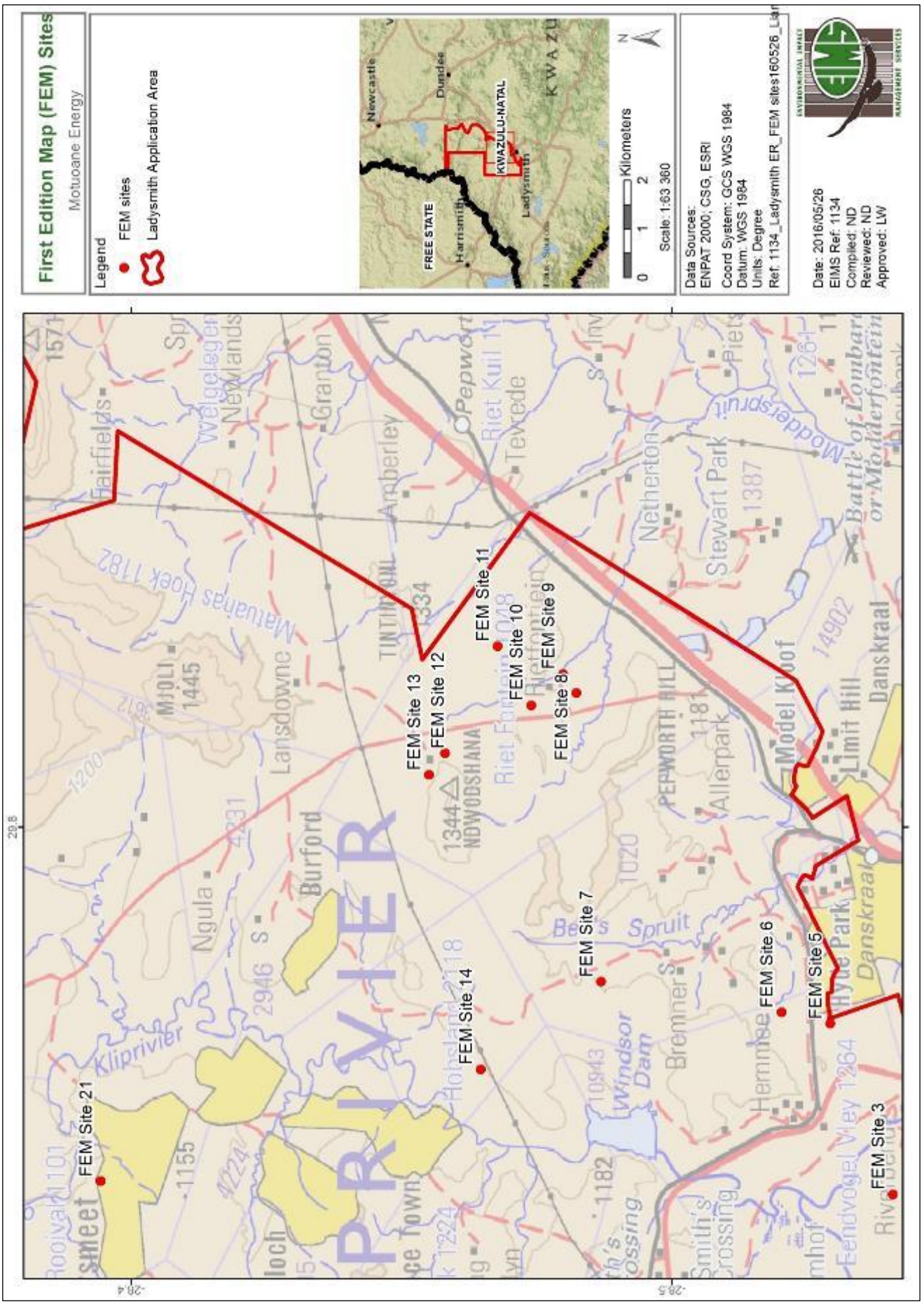

Figure 31 – Map depicting a closer view of the central-eastern end of the study area, showing the sites identified from the First Edition Topographical Map Sheets.

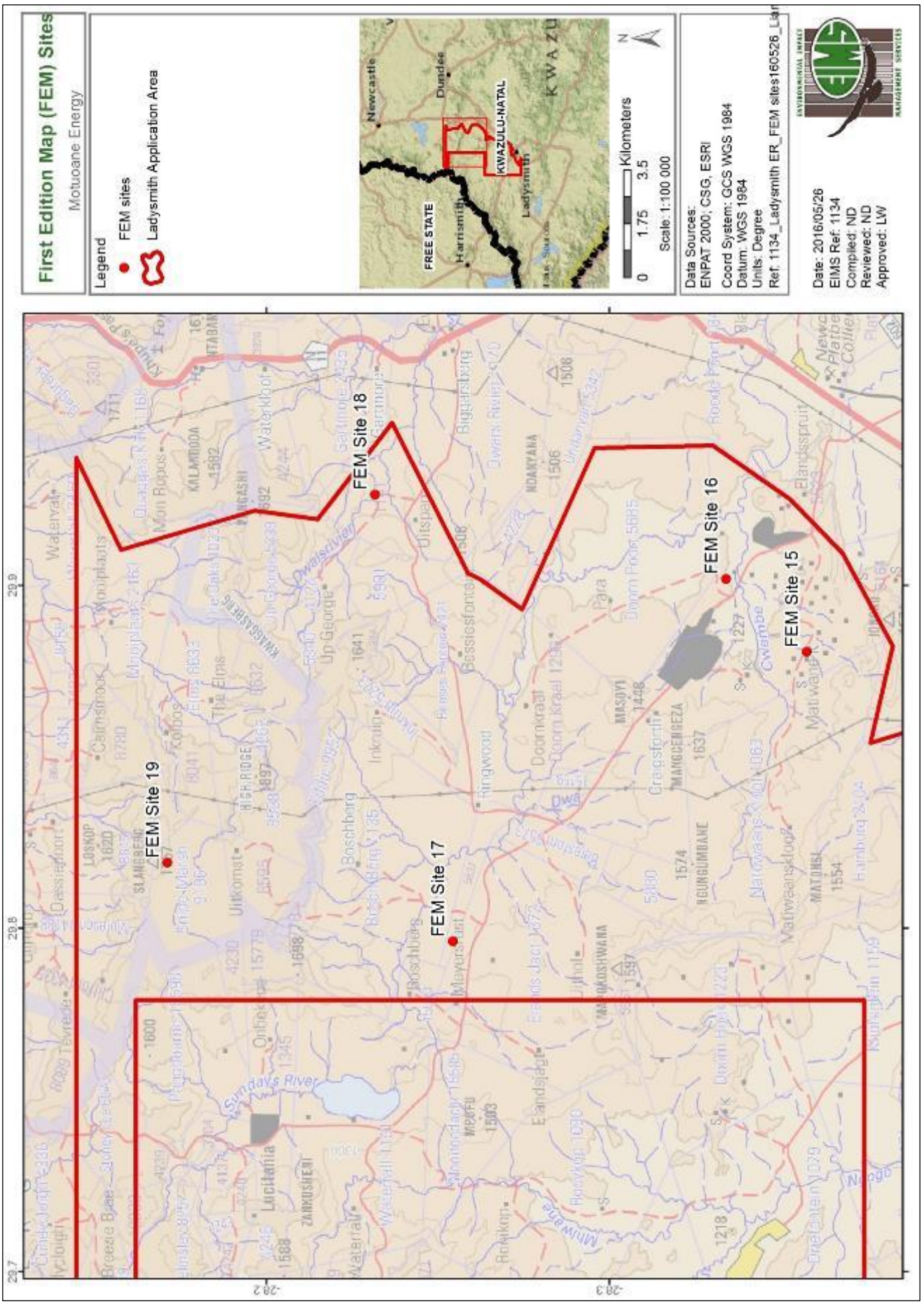

Figure 32 – Map depicting a closer view of the northern end of the study area, showing the sites identified from the First Edition Topographical Map Sheets.

6.5 Archaeological Database of the Natal Museum

The Natal Museum in Pietermaritzburg was visited on Monday, 6 June 2016 to access the museum's archaeological database. A study of the database maps revealed that eight archaeological sites listed on the museum database are located within the present study area.

Of the eight archaeological sites from the database that fall within the study area, five are Stone Age sites. Two of these sites comprise rock shelters (2829BD 1 & 2829BD 2), one site consists of three indivdiual rock shelters and contains rock art (2829BB 8) while the other two sites comprise lithics that were revealed by erosion (2829DA 4 & 2829BC 5). The remaining three sites from within the study area (2829DB 11, 2829DB 45 & 2829DB 46) can all be associated with the Late Iron Age.

Table 11- List of know archaeological site as contained in the archaeological database

SITE NUMBER	DESCRIPTION
2829DB 11	Late Iron Age site comprising an eroded area of grey soil and dolerite rubble including slag droplets, furnace fragments, plain thick pottery and upper grindstones.
2829DB 45	Late Iron Age site comprising a large stonewalled site that was laid out to utilise a kloof as an entrance.
2829DB 46	Possible Late Iron Age stonewalled site revealed using aerial photographs.
2829DA 4	Erosion activity has revealed heavily rolled and patinated flakes and one cleaver.
2829BD 1	The site comprises a shelter, with deposits of bone, pottery and stone present.
2829BD 2	The site comprises a shelter.
2829BC 5	The site is a donga on the Harrismith road from Ladysmith. The artifacts include a small dolorite cleaver.
2829BB 8	The site comprises three shelters, with rock paintings.

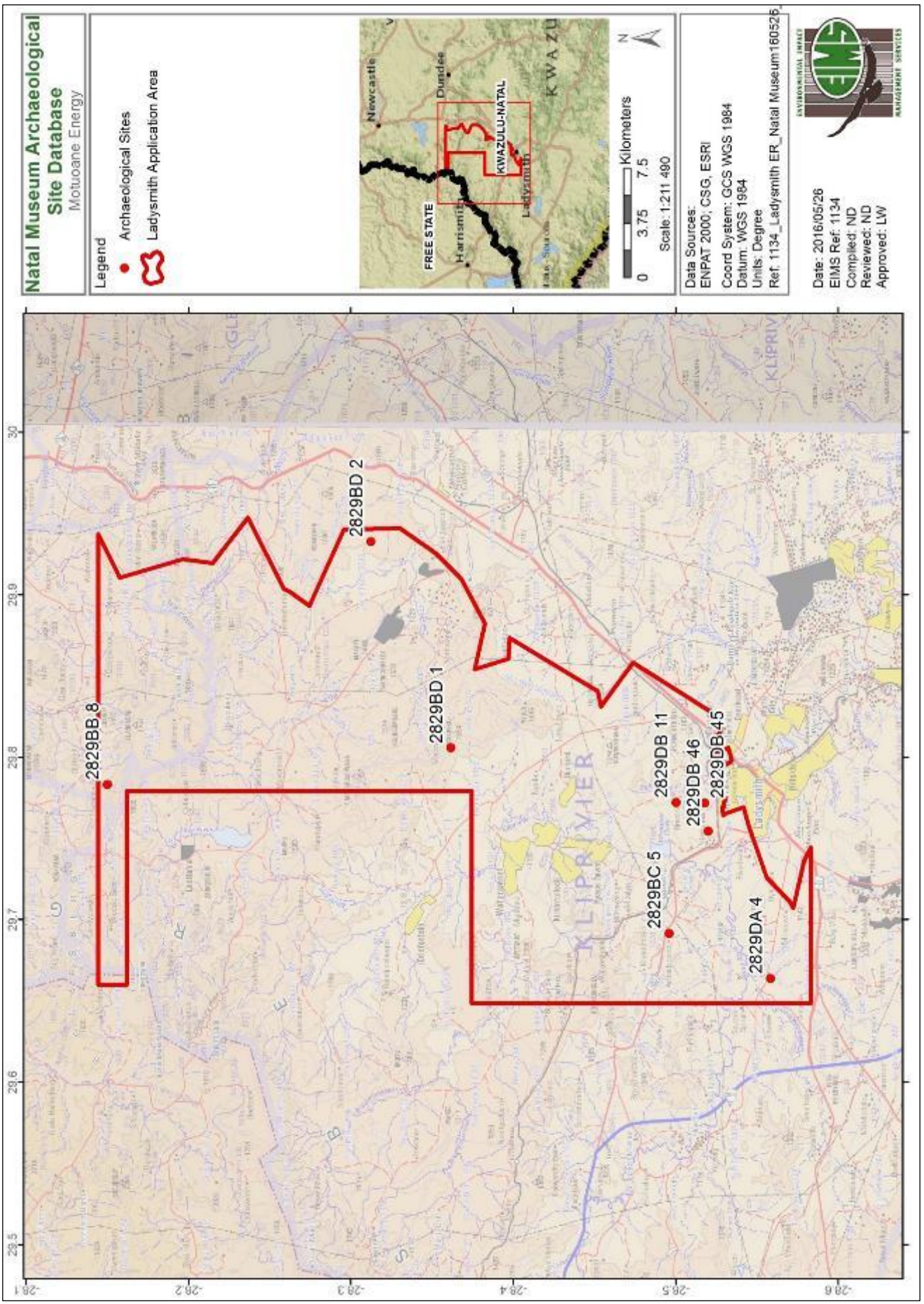

Figure 33 – Map depicting the localities of known archaeological sites from within the study area as revealed during an assessment of the Natal Museum Archaeological Database.

6.6 Historic Settlements from within the Study Area

6.7.1 Introduction

The first editions of the available topographical map sheets have revealed the presence of a number of historic settlements located within the study area. These include Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. In the section that follows, a brief discussion about each of these settlements will be provided.

6.7.2 Besters / Kumalosville

While Besters is a nearby railway siding, the settlement of Kumalosville appears to have been started in January 1908 when "…*Mr Daniel Bester sold 250 acres of land to an African syndicate whose trustees were Chief J.H. Kumalo and Messrs. T. Kumalo and E. Lutango*." (Brown, n.d.:4).

Kumalosville was designated a black spot by the Apartheid government and in October 1963 its residents were relocated to Hobsville. Kumalosville was subsequently demolished (Brown, n.d.).

6.7.3 Watersmeet, Peace Town and Burford

For this section it is important to note that the settlements of Watersmeet and Burford were located on farms bearing the same names while Peace Town was located on the farm Kirkintulloch.

The origins of these settlements commence in 1845 when Reverend John Allison of the Wesleyan Mission formed a syndicate with three black missionaries namely Johannes Khumalo, Jonathan Xaba and Abraham Turala. In the subsequent years the syndicate purchased a number of farms from private landowners, including the farm Driefontein in 1867, Kleinfontein in 1868 and Doorn Hoek in 1878.

Johannes Khumalo, one of the evangelists who co-founded the original syndicate in 1845, established a second syndicate which also acquired a number of farms, namely Burford in 1882, Kirkintulloch in 1883 and Watersmeet in 1892.

Due to forced removals from nearby farms, the properties owned by these syndicates became increasingly settled. This was augmented by the low rentals charged by these syndicates as well as the proximity of these farms to employment centres such as Ladysmith. During the Apartheid years, these farms were designated as black spots and attempts were made to relocate the people living there (Emnambithi / Ladysmith Local Municipality, 2011).

6.7.4 Vulandondo

The settlement of Vulandondo was a resettlement area created by the Apartheid government for the resettlement of the residents of Kumalosville/Besters in October 1963. In 1972 the settlement was relocated again, this time to Ezakheni (Surplus People Project, 1983).

6.7.5 Matowaans Kop

The farm Matiwanes Kop was bought between 1870 and 1880 by a syndicate consisting of "*…120 people of the Shabalala Tribe*." The land was subdivided during the early twentieth century and property rights were transferred to individuals. From the 1940s onward, the community lived under threat of forced removal. In 1980 the government expropriated the land. However, the community refused to leave their land. This refusal came to a head in June 1990, when the community won back their land rights (Newsletter of the Association for Rural Advancement, 1992).

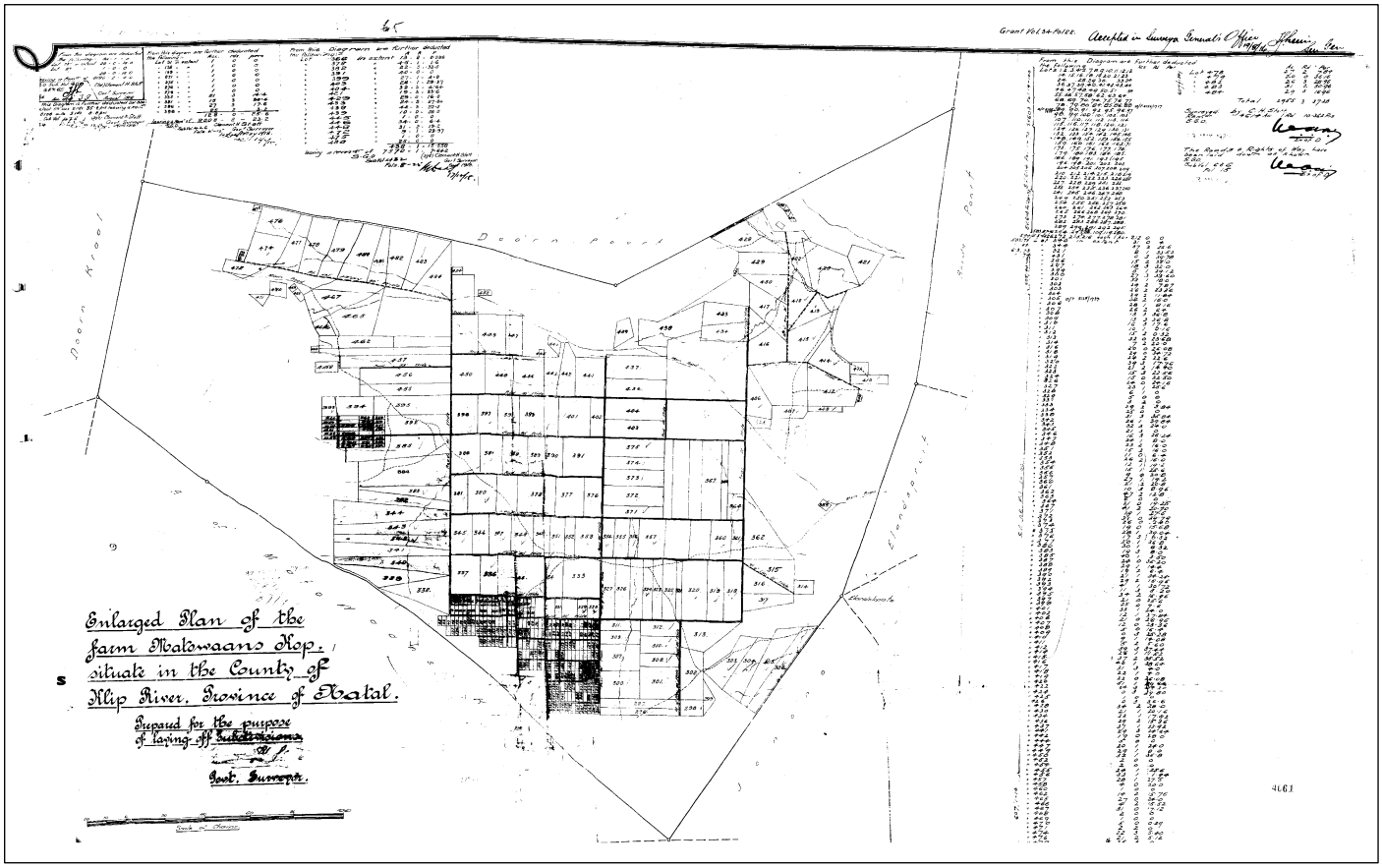

Figure 34 – Survey diagram of the subdivision of the farm Matiwaans Kop to allow for the registration of individual property rights. This particular survey diagram was approved by the Surveyor General on 19 August 1916 (Chief Surveyor-General of South Africa).

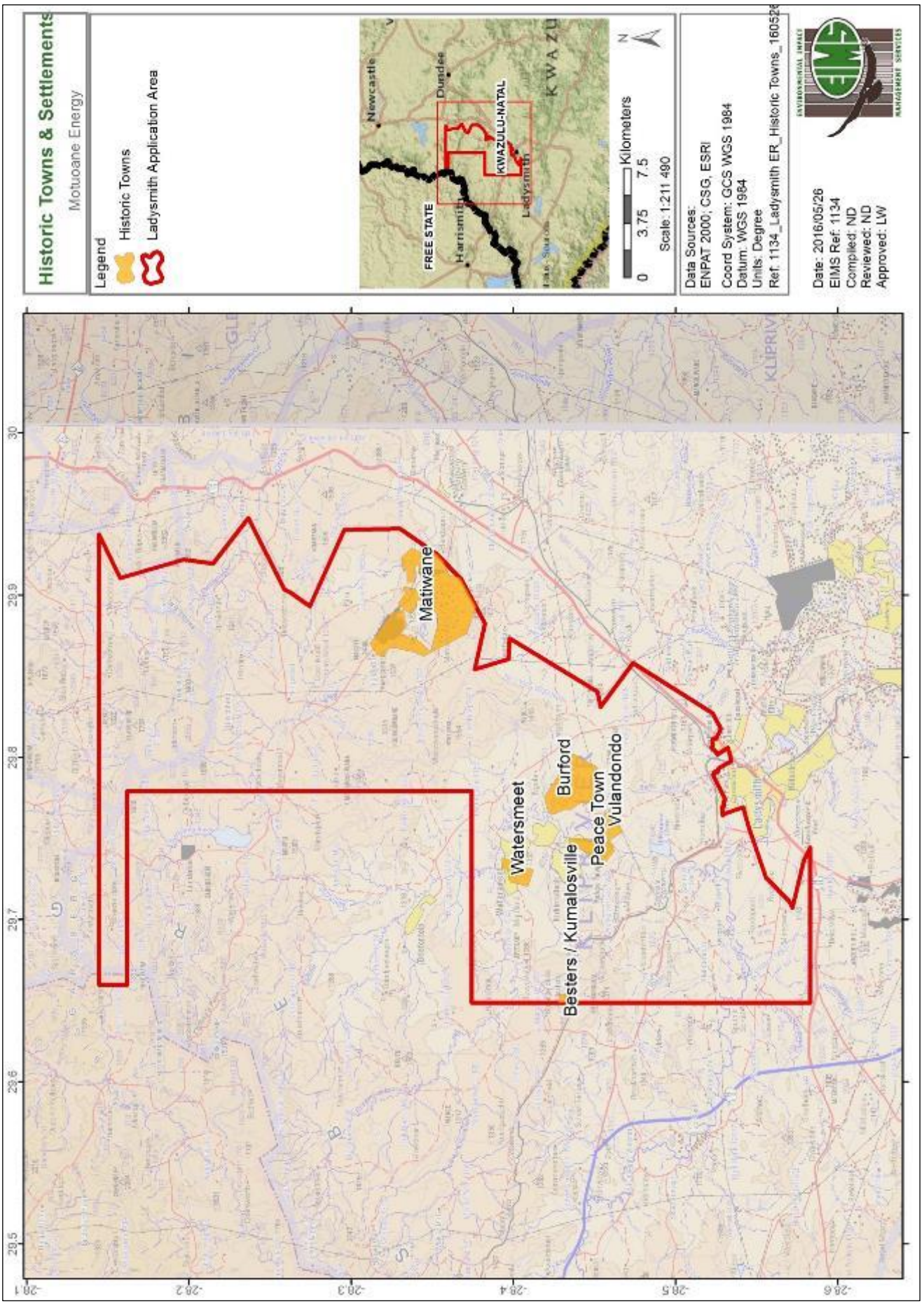

Figure 35 – Map depicting the localities of historical settlements and towns located within the study area. The approximate extents of these features as revealed by the First Edition Topographic Maps are shown in orange.

7. DESCRIPTION OF POTENTIAL IMPACTS

7.1 Potential Fatal Flaws

Fatal flaws would constitute environmental characteristics, which cannot or may not interact with the proposed development. From a heritage point of view, fatal flaws can be seen as a heritage resource/s present on the site that will halt the project and that cannot be mitigated due to site constraints such as limited space to implement buffer or no-go zones. In most case the implementation of buffer zones and extensive conservation management plans can change possible fatal flaws as noted in **Table 27**.

Table 12—Examples of heritage resources are provided below that could constitute a fatal flaw on a development site where buffer zones and exclusion zones are impossible to implement

Heritage Resource	Example
Rock Art	Rock art, in the form of paintings or engravings situated within a development area are seen as immovable resources and can only be moved under exceptional circumstances.
National or Provincial Heritage Sites	Site specific monuments like battles or major sites or structures with considerable significance.
Sacred Sites	Immovable sites associated with religion or cultural groupings, such as sacred pools, historic initiation school sites, etc.
Archaeological sites of National Significance	Sites such as Mapungubwe Hill or an archaeological landscape such as the Limpopo Valley or The Cradle of Humankind.
Cultural Landscapes of significance	Landscapes such as valleys and vistas held as being of national or international importance.

7.2 Identified Non-Fatal Flaws

i. The archival and historical desktop study has revealed that sections of the Siege of Ladysmith (2 November 1899 - 27 February 1900) were located within the present study area. This siege represents one of the three major sieges which the Boer forces undertook during the first few months of the war, the other two being Kimberley and Maheking. The research undertaken for the present study has shown that sections of the Boer siege lines were located within the study area, as were the main Boer positions at Rifleman's Ridge, Lancer's Nek, Telegraph Ridge, Thornhill Kop, Surprise Hill, an Unknown Ridge as well as Pepworth Hill. The positions and approximate extents of these historically significant features were recorded and included in this report.

ii. The archival and historical desktop study has also revealed that a number of battles of the South African War (1899-1902) occurred within the study area, namely Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (as part of the British assault on Lancer's Hill) (3 & November 1899) as well as the British raid on a Boer artillery position at Surprise Hill (10 & 11 December

1899. The positions and approximate extents of these historically significant features were recorded and included in this report.

iii. The Archaeological Database of the Natal Museum was accessed for this study to assess whether any known archaeological sites are located within the present study area. A study of the database maps revealed that eight archaeological sites listed on the museum database are located within the present study area. Of the eight archaeological sites from the database that fall within the study area, five are Stone Age sites. Two of these sites comprise rock shelters (2829BD 1 & 2829BD 2), one site consists of three indivdiual rock shelters and contains rock art (2829BB 8) while the other two sites comprise lithics that were revealed by erosion (2829DA 4 & 2829BC 5). The remaining three sites from within the study area (2829DB 11, 2829DB 45 & 2829DB 46) can all be associated with the Late Iron Age.

iv. With the use of historical topographic sheets, a total of 21 sites were identified on the First Editions of the Topographic Sheets. Seventeen of these 21 sites comprise cemeteries, with the remaining four sites comprised of military structures (2), a memorial as well as a historic mountain pass. The positions of these sites were recorded and included in this report. At the same time, the existence of a number historic structures and buildings (including farmhouses) were revealed. However, due to the massive extent of the study area, their individual positions could not be recorded. However, the significance of these built structures can only be assessed at the ground verification stage. It is also important to note that the presence of historical structures is often associated with individual graves or cemeteries. The possible presence of graves can only be verified at the ground verification stage. Furthermore, and as indicated elsewhere, experience has shown that according to African tradition, graves of small children were traditionally buried in close proximity to the houses of their parents. This feature should be addressed as part of the project social consultation process.

v. An assessment of the cemetery database of the Genealogical Society of South Africa was made. This assessment has shown that four of the cemeteries contained in the database are located within the present study area. These four cemeteries are located on the farms Rooival, Arcadia, Mielietuinhoek and Up George. The positions of these cemeteries were recorded and included in this report.

vi. Six historic settlements or towns were identified within the study area during the historic background study. These settlements are also depicted on the First Edition maps sheets. These settlements are Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. The historic research has shown that many of these settlements had origins dating back to the mid-nineteenth century. The positions of these settlements as well as their approximate extents were recorded and included in this report.

7.3 Identification of Areas for Further Specific Fieldwork

As noted above, the presence of a number of heritage sites from within the study area were revealed during this study. These include battlefields and sites associated with the South African War, known archaeological sites, known cemeteries as well as historic settlements. Any identified sites identified as part of this Heritage Scoping Report should

ideally be avoided in the placement of development footprints. Furthermore, once these development footprints have been finalized, will have to be covered by detailed fieldwork during the Heritage Impact Assessment.

7.4 Identification of Areas of Heritage Sensitivity

All the relevant sources of heritage information used in this study was summarised in a heritage sensitivity map. This map provides a zoned depiction of the study area wherein areas of varying heritage sensitivity are indicated and will be used in conjunction with the other sensitivity maps produced by the specialists to assess the feasibility of the proposed development and to allow the planning of the layout of the proposed development in such a way that the least possible impact is generated.

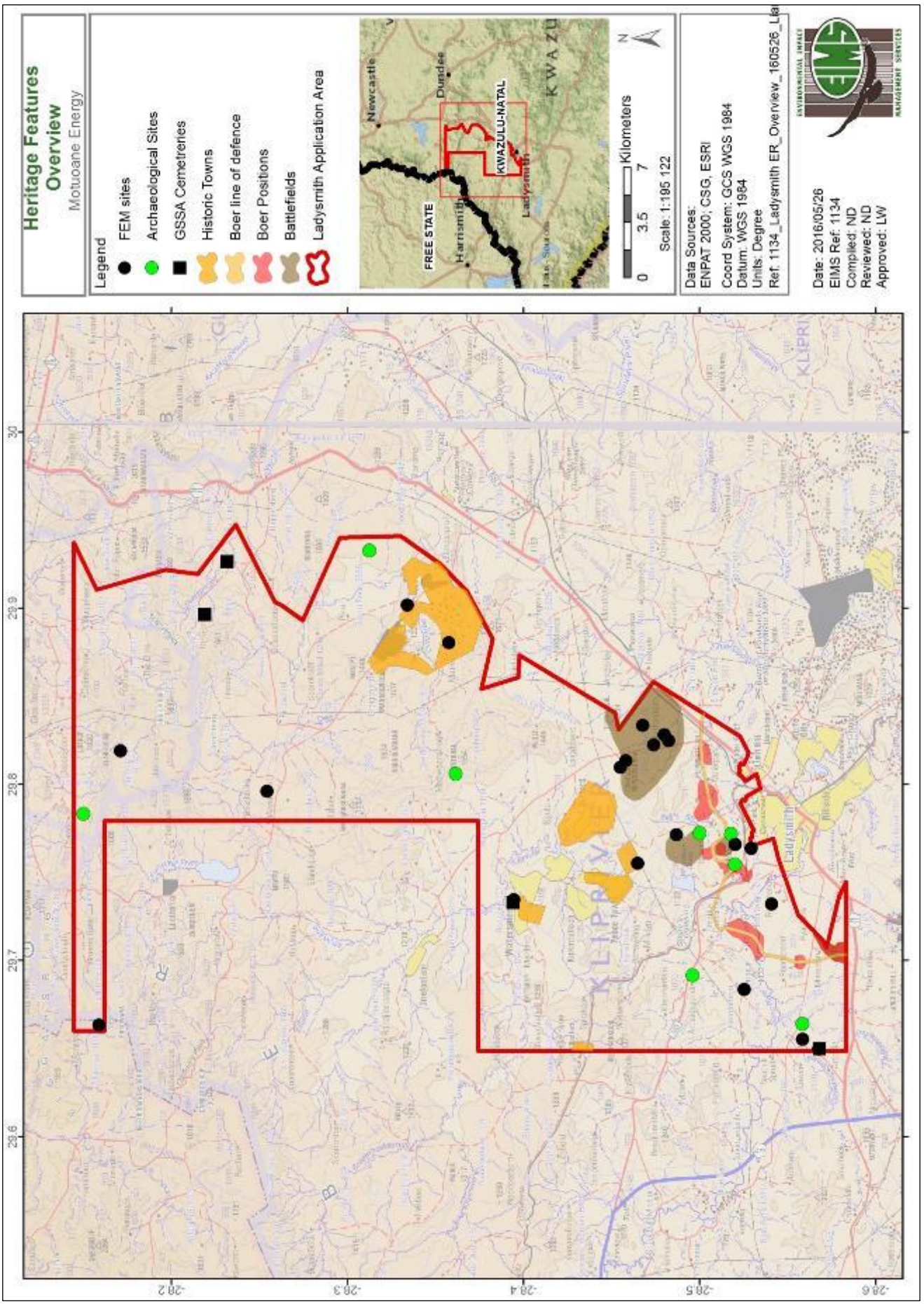

Figure 36 – Map depicting the combined heritage sensitive areas across the study area.

8. DETAILED PLAN OF STUDY FOR THE EIA AND EMP

The following will be required to develop a final HIA to manage the heritage resources within the proposed development areas.

8.1 Methodology

8.1.1 Physical Surveying

The fieldwork component will consist of a detailed walk through of the proposed footprint areas and is aimed at locating heritage resources falling within these areas. The locations of all heritage resources that are recorded during the survey will be documented using a hand-held GPS. Furthermore, the documentation will reflect a brief qualitative description and statement of significance for each site and include a photographic record of all the identified sites.

It is important to also note that informal social consultation (i.e. with local community members, residents and knowledgeable individuals) may be undertaken during the fieldwork component. The aim of social consultation is to identify any tangible and intangible resources (i.e. sacred places, myths and indigenous knowledge resources) that may exist.

8.1.2 *Deliverables*

A report will be written which would include the following components:

- The identification and mapping of all heritage resources in the affected area;
- An assessment of the significance of such resources in terms of the heritage assessment criteria;
- An assessment of the impact of the development of such heritage resources;
- If heritage resources will be adversely affected by the proposed development, consideration of the alternatives;
- Proposed mitigation of any adverse effects during and after the completion of the proposed development.

9. POTENTIAL IMPACTS AND FURTHER WORK FOR EIA PHASE

The desktop evaluation of the study area and surrounds has shown that the possibility exists of finding various heritage resources in the proposed study area, including Stone Age sites, Late Iron Age stonewalled settlements, historical structures, graves and cemeteries as well as battlefields.

Once the final study area has been defined, this will have to be assessed by way of detailed walkthroughs during the HIA phase of the project. This will allow for an assessment of the actual impact of the proposed development on any heritage sites located there i.e. a footprint area specific heritage impact assessment.

Table 13- Potential Impacts to Consider for the Heritage Impact Assessment Phase

	IMPACT	STAGE OF PROJECT
ISSUE	**DISTURBANCE OR DESTRUCTION OF COMPONENTS OF THE SIEGE OF LADYSMITH**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study has revealed that components of the Siege of Ladysmith (2 November 1899 – 27 February 1900) are located within the present study area. These comprise a section of the line held by the Boer forces during the siege, as well as some of their positions such as Pepworth Hill, Surprise Hill, Thornhill Ridge, Telegraph Ridge, Lancer's Nek as well as the Rifleman's Ridge.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	The Siege of Ladysmith can be defined as battlefields. Such battlefields are protected by the NHRA, and under certain circumstances the core components of a particular battle site can be defined as a cultural landscape worth protecting. The area within which this component of the battle took place was included in the sensitivity mapping. This area should ideally be excluded from any future work. However, should any footprints be located within or near this area, archaeological fieldwork and further archival and historical research coupled with the compilation of a heritage impact assessment should represent sufficient identification of any remaining tangible heritage aspects.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The area included in the sensitivity map should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on the battle whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should tangible or intangible sites or features be identified that will be impacted upon by the proposed development, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be

		demarcated. Alternatively, mitigation measures such as the archaeological excavation and mitigation of identified tangible components of the siege must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF BATTLEFIELDS**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study has revealed that a number of battles associated with the South African War (1899 – 1902) occurred within the study area. These include Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (as part of the British assault on the position at Lancer's Hill) (3 & 4 November 1899) as well as the British raid on the Boer artillery position at Surprise Hill (10 & 11 December 1899).	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Battlefields are protected by the NHRA, and under certain circumstances the core components of a particular battle site can be defined as a cultural landscape worth protecting. The area within which this component of the battle took place was included in the sensitivity mapping. This area should ideally be excluded from any future work. However, should any footprints be located within or near this area, archaeological fieldwork and further archival and historical research coupled with the compilation of a heritage impact assessment should represent sufficient identification of any remaining tangible heritage aspects.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The area included in the sensitivity map should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on the battle whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should tangible or intangible sites or features be identified that will be impacted upon by the	

	proposed development, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF HISTORIC SETTLEMENTS**	**CONSTRUCTION**
DISCUSSION	The archival and historical desktop study as well as the assessment of the First Edition Topographic Sheets has revealed the existence of a number of historic settlements within the study area. These include Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. The historic research undertaken for the present study area has shown that many of these settlements had origins dating back to the mid-nineteenth century	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified archaeological sites can seriously hamper construction and development activities and timelines. Destruction or damage of such sites requires a permit from the responsible heritage authority (NHRA, section 35). Fieldwork can provide valuable information on such sites in the study area and provide timeous management through various mitigation measures, including the realignment of the construction activities, if necessary.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The areas included in the sensitivity maps should ideally be avoided during the placement of development footprints. If this proves impossible, archaeological and heritage field surveys of the development footprint areas must be undertaken once these have been established. This should be augmented by further archival desktop study work on these concentration camps whenever development footprints closer than 1 000 m to the recorded sensitive area are proposed. Should archaeological sites be identified, suitable mitigation measures will have to be outlined.	

WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF ARCHAEOLOGICAL SITES**	**CONSTRUCTION**
DISCUSSION	The Archaeological Database of the Natal Museum was accessed which revealed that eight archaeological sites are known to be located within the study area. These comprise five Stone Age sites and three Late Iron Age sites. The possibility certainly exists for more archaeological sites to be located within the study area, Once the development footprint areas have been confirmed, an archaeological foot survey must be undertaken of these footprint areas to identify any archaeological sites located there. This would assist in developing a comprehensive Heritage Management Plan for the construction activities.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified archaeological sites can seriously hamper construction and development activities and timelines. Destruction or damage of such sites requires a permit from the responsible heritage authority (NHRA, section 35). Fieldwork can provide valuable information on any such sites from the study area and provide timeous management of such sites, including the realignment of the construction activities, if necessary.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	The known archaeological sites as revealed by the Natal Museum Archaeological Database should be avoided during the placement of development footprints. The identification of yet undiscovered archaeological sites would be addressed by way of archaeological and heritage field surveys of the footprint areas, once these have been established. Should archaeological sites be identified, suitable mitigation measures will have to be outlined.	

WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF HISTORIC BUILDINGS OR STRUCTURES**	**CONSTRUCTION, OPERATION**
DISCUSSION	The existence of historic buildings and structures within the study area was revealed during the desktop study, when the first edition topographic sheets were found to depict a number of historic buildings and structures. Due to the large extent of the study area, and the relatively high number of these depicted features, the historic structures and buildings depicted on these maps were not individually recorded nor included in the existing heritage significance maps. The possible presence of even more historic structures appears likely.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Damage or destruction of farm buildings and associated structures. Destruction or damage of such sites older than 60 years, would requiree a permit from the responsible heritage authority.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	An archaeological and heritage field survey of any additional footprint areas not yet assessed. Should such sites be identified, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas (if required) need to be demarcated. Alternatively, mitigation measures such as the archaeological excavation of sites must be planned and scheduled to fit within the timing of the project phases.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF GRAVES AND CEMETERIES**	**CONSTRUCTION**
DISCUSSION	The existence of graves and cemeteries has been confirmed during the desktop study work, with the presence of 17 cemeteries within the	

	study area revealed during an assessment of historic topographic maps. Furthermore, the cemetery database of the Genealogical Society of South Africa was also accessed which has four cemeteries located within the study area. The individual positions of these cemeteries were recorded and were included in the sensitivity maps. The possibility that more cemeteries may be located within the study area is a distinct possibility.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified graves and cemeteries and the discovery of such sites can seriously hamper construction and development timelines. Damage, destruction or removal of such sites requires a permit from various responsible authorities, including the Heritage Authority (NHRA, section 36), Provincial Health Department and the SA Police Service. Such a process can take up to 12 months to finalise. Fieldwork can provide valuable information on the presence of such sites in the study area and provide timeous management of such sites, which may include the realignment of the proposed development activities. In the event that identified graves and cemeteries cannot be avoided, a grave relocation process needs to be initiated, bearing in mind that such a process impacts on the spiritual and social fabric of the next of kin and associated communities.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	Avoidance of the identified cemeteries and graves in future proposed exploration footprints (where possible) and an archaeological field survey of any additional footprint areas not yet assessed. Should graves and cemeteries be identified, suitable mitigation measures will have to be outlined.	
WHEN IS MITIGATION REQUIRED		During design and before construction no-go areas need to be demarcated. Alternatively, mitigation measures such as the physical relocation of the graves in question (including aspects such as detailed social consultation) needs to be planned and scheduled to fit within the timing of the project phases. It must be understood that such a process may have an impact on the spiritual and social fabric

		of the next of kin and associated communities.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE OR DESTRUCTION OF UNMARKED GRAVES**	**CONSTRUCTION**
DISCUSSION	From experience on similar sites and the knowledge of cultural customs and traditions, it is known that stillborn babies and deceased infants occasionally were buried within the homesteads of black rural communities. These children were sometimes buried underneath the floors and walls of houses and huts and the burials were not marked, but were known to the immediate family.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified graves and the discovery of such sites can seriously hamper construction and development timelines. Damage, destruction or removal of such sites requires a permit from various responsible authorities, including the Heritage Authority (NHRA, section 36), Provincial Health Department and the SA Police Service. Such a process can take up to 12 months to finalise. Social consultation with present and former residents of the study area can provide valuable information on the presence of such sites in the study area and provide timeous management of such sites, which may include the realignment of the proposed development activities. Archaeological monitoring of the development footprint areas will identify any unmarked human skeletal remains. In the event that such graves cannot be avoided, a grave relocation process needs to be initiated, bearing in mind that such a process impacts on the spiritual and social fabric of the next of kin and associated communities.	Destruction or damage during exploration activities.
EIA INVESTIGATION REQUIRED	A social consultation process with current and former residents of the study area can assess whether such sites are located within the study area. Archaeological monitoring during construction will also identify any human skeletal remains.	
WHEN IS MITIGATION REQUIRED		During design and before construction, social consultation needs to take place to

		assess whether such sites are located within the footprint areas. Archaeological monitoring during the construction phase will also identify any human remains.
	IMPACT	**STAGE OF PROJECT**
ISSUE	**DISTURBANCE, DAMAGE OR DESTRUCTION OF PALAEONTOLOGICAL RESOURCES**	**CONSTRUCTION, OPERATIONAL**
DISCUSSION	The palaeontological significance of the study area is not known at the moment. However, during the EIA Phase a palaeontologist will be appointed to undertake a palaeontological desktop study of the footprint areas.	
EXISTING IMPACT	None known.	
PREDICTED IMPACT	Unidentified palaeontological resources and the discovery of such resources can seriously hamper construction and development timelines. Damage, destruction or removal of such sites require a permit from the responsible heritage authority (NHRA, section 35).	Destruction or damage during the construction of the pipelines and other development components.
EIA INVESTIGATION REQUIRED	The mitigation measures recommended in the palaeontological desktop study must be undertaken.	
WHEN IS MITIGATION REQUIRED		During design and before construction, the mitigation measures outlined in the palaeontological desktop study will have to be undertaken.

10. CONCLUSIONS AND RECOMMENDATIONS

PGS Heritage was appointed by Environmental Impact Management Services (EIMS) to undertake a Heritage Scoping Report for the proposed Motuoane Ladysmith Exploration Right. The study area is located north of Ladysmith and within the Emnambithi / Ladysmith Local Municipalities of the Uthukela District Municipality and is situated within the Kwazulu-Natal Province.

The purpose of the Heritage Scoping report is to identify at a desktop level what the probability is of heritage resources being identified in the study area. This is important because heritage resources are protected in terms of the National Heritage Resources Act, No 25 of 1999, (NHRA) from *inter alia*, destruction or damage, excavation or removal, or other disturbance, without a permit from the responsible heritage resources authority. The National Heritage Resources Act, No 25 of 1999, (NHRA) states that heritage resources are unique and non-renewable and, as such, any impact on such

resources must be seen as significant (NHRA, section 5(1)(a)). The NHRA specifically protects certain categories of heritage resources, i.e.: structures, archaeological and paleontological (including meteorological) sites and material and graves and burial grounds (NHRA, sections 34, 35 and 36). Furthermore, Section 38 of the NHRA provides for and regulates the compilation of impact assessment reports of heritage resources that may be affected by construction or development activities.

The desktop research for the Heritage Scoping Report has revealed that the study area and surrounding landscape have a long and diverse historical and archaeological history and that significant potential exists for archaeological and historical sites and material to be located within the study area. The research has also identified specific possible heritage sensitive areas within the study area.

The Scoping Report will be followed by a a Heritage Impact Assessment (HIA), which would include the findings of this desktop study report and would provide recommendations for mitigation (destruction, recording and/or avoidance) of the confirmed heritage resources to be impacted upon by the proposed development. The period in-between the existing Heritage Scoping Report and the Final Heritage Impact Assessment Report will be used to finalise any footprints relating to the proposed exploration activities.

The Heritage Scoping Report has highlighted a number of heritage aspects, some of which would require further assessment and mitigation in the subsequent Heritage Impact Assessment report. These aspects include two sensitivities associated with the South African War (1899-1902) namely the Siege of Ladysmith (2 November 1899 – 27 February 1900) as well as a number of battlefields. Other aspects identified include historic settlements, archaeological sites, historic buildings and structures, cemeteries, palaeontology as well as unmarked graves from within the study area.

Siege of Ladysmith (2 November 1899 – 27 February 1900)

The South African War (1899-1902) had a significant impact across the country, and also within the study area. The archival and historical desktop study has revealed that sections of the Siege of Ladysmith (2 November 1899 - 27 February 1900) were located within the present study area. This siege represents one of the three major sieges which the Boer forces undertook during the first few months of the war, the other two being Kimberley and Maheking. The research undertaken for the present study has shown that sections of the Boer siege lines were located within the study area, as were the main Boer positions at Rifleman's Ridge, Lancer's Nek, Telegraph Ridge, Thornhill Kop, Surprise Hill, an Unknown Ridge as well as Pepworth Hill. The positions and approximate extents of these historically significant features were recorded and included in this report.

Areas of expected sensitivity in terms of the siege were highlighted on the sensitivity map. If at all possible, this area should be avoided in the placement of development footprints. Furthermore, archaeological field surveys of the proposed development footprint areas during the Heritage Impact Assessment should identify any tangible remains of the battle and the associated heritage impact assessment would address any percieved significant impacts on this battle and its associated tangible remains. Additionally, such field assessments must be augmented by further archival and historical research, especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment.

Battlefields associated with the South African War (1899 – 1902)

The archival and historical desktop study has also revealed that a number of battles of the South African War (1899-1902) occurred within the study area, namely Rietfontein (24 October 1899), Modderspruit (30 October 1899), Nicholson's Nek (30 October 1899), Rifleman's Ridge (as part of the British assault on Lancer's Hill) (3 & November 1899) as well as the British raid on a Boer artillery position at Surprise Hill (10 & 11 December 1899. The positions and approximate extents of these historically significant features were recorded and included in this report.

Areas of expected sensitivity in terms of the siege were highlighted on the sensitivity map. If at all possible, this area should be avoided in the placement of development footprints. Furthermore, archaeological field surveys of the proposed development footprint areas during the Heritage Impact Assessment should identify any tangible remains of the battle and the associated heritage impact assessment would address any percieved significant impacts on this battle and its associated tangible remains. Additionally, such field assessments must be augmented by further archival and historical research, especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment.

Historic Settlements

Six historic settlements or towns were identified within the study area during the historic background study. These settlements are also depicted on the First Edition maps sheets. These settlements are Besters/Kumalosville, Watersmeet, Peace Town, Burford, Vulandondo and Matiwane/Matowaans Kop. The historic research has shown that many of these settlements had origins dating back to the mid-nineteenth century. The positions of these settlements as well as their approximate extents were recorded and included in this report.

The areas included in the sensitivity maps should ideally be avoided during the placement of development footprints. Archaeological and heritage field surveys of the development footprint areas must be undertaken once these have been established. Additionally, such field assessments must be augmented by further archival and historical research,

especially should any of the development footprints be proposed within 1 000 m of the identified sensitive area. If required, further mitigation measures will be outlined in the Heritage Impact Assessment Report.

Archaeological Sites

The Archaeological Database of the Natal Museum was accessed for this study to assess whether any known archaeological sites are located within the present study area. A study of the database maps revealed that eight archaeological sites listed on the museum database are located within the present study area. Of the eight archaeological sites from the database that fall within the study area, five are Stone Age sites. Two of these sites comprise rock shelters (2829BD 1 & 2829BD 2), one site consists of three indivdiual rock shelters and contains rock art (2829BB 8) while the other two sites comprise lithics that were revealed by erosion (2829DA 4 & 2829BC 5). The remaining three sites from within the study area (2829DB 11, 2829DB 45 & 2829DB 46) can all be associated with the Late Iron Age.

The recorded localities of these archaeological sites as recorded on the heritage sensitivity maps should ideally be avoided during the placement of development footprint areas. All proposed development footprints will have to be assessed in the field by way of archaeological field surveys to identify any archaeological sites and features which may be located within those footprint areas. These studies will be required to determine the significance of each site and to assess the possible development impacts on each of them during the Heritage Impact Assessment phase. If required, further mitigation measures will be outlined in the Heritage Impact Assessment Report.

Historic Buildings and Structures

The existence of historic buildings and structures within the study area was revealed during the desktop study, when the first edition topographic sheets were found to depict a large number of historic buildings and structures. Due to the large extent of the study area as well as the high number of these depicted features, the historic structures and buildings depicted on these maps were not individually recorded nor included in the existing heritage significance maps. An assessment of previous archaeological and heritage studies from within the study area has revealed the presence of one such a historic structure within the study area.

Once development footprints are defined, such footprint areas will have to be assessed in the field by way of archaeological field surveys to identify any historic buildings or structures which may be located within the development footprint areas. Additionally, an assessment by an architectural historian of each historic building and structure located within or near such footprint areas will also have to be undertaken. These studies will be required to determine significance of each building or structure and will assess the possible development impacts on each of

them during the Heritage Impact Assessment phase. At the same time appropriate mitigation measures will also be outlined.

Graves and Cemeteries

The existence of graves and cemeteries has been confirmed during the desktop study work, with the presence of 21 cemeteries within the study area revealed during an assessment of historic topographic maps sheets as well as the use of the cemetery database of the Genealogical Society of South Africa. The individual positions of these cemeteries were recorded and these were included in the sensitivity maps. The possibility that even more cemeteries may be located within the study area is a distinct possibility.

The recorded localities of these cemeteries as depicted on the heritage sensitivity maps should ideally be avoided during the placement of development footprint areas. Any marked graves and cemeteries located within future development footprint areas will be identified during the archaeological walkthroughs of those footprint areas. Cemeteries and grave sites are protected by various legislations and the best option would be the in situ preservation of the sites. Should this not be possible, a standard grave relocation process (including a detailed social consultation process) must be undertaken.

Unmarked Graves in Homesteads

An evaluation of the available historic maps has revealed a significant number of historic homesteads of black African communities within the study area. The presence of these features raises another heritage concern, that of unmarked stillborb babies. In terms of black African tradition, stillborn babies were often buried in unmarked graves underneath or adjacent to the homesteads of their parents. Cemeteries and grave sites are protected by various legislations and the best option would be social consultation with the former (or present) residents of this area to assess whether any such unmarked graves are located within the final study area for the Heritage Impact Assessment. This mitigation measure must be supported by archaeological monitoring of the development activities.

Palaeontology

The palaeontological significance of the study area is not known at the moment. However, during the EIA Phase a palaeontologist will be appointed to undertake a palaeontological desktop study of the exploration footprint areas.

The data on the different types of heritage resources identified from the fieldwork will be compiled in a final HIA report. This report will utilise the Plan of Study for the EIA/HIA (***Section*** 8) as well as the significance rating

(***ANNEXURES A and B***) to identify and rank the impacts on the heritage resources into the final detailed EIA investigation.

Potential impacts to be identified and evaluated during the EIA include:

- Disturbance / destruction of components of the Siege of Ladysmith
- Disturbance / destruction of various battlefields associated with the South African War
- Disturbance / destruction of historic settlements from within the study area
- Destruction / damage of archaeological sites
- Disturbance / destruction of historic buildings and structures
- Disturbance / destruction of cemeteries and graves
- Disturbance / destruction of unmarked stillborn graves
- Disturbance / destruction of palaeontological material

Once the development footprint areas are defined, these will have to be assessed by way of detailed walkthroughs during the HIA phase of the project. This will allow for an assessment of the impact of the proposed development on any heritage sites located there.

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Historic Topographic Maps

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

Google Earth

All the aerial depictions used in this report are from Google Earth.

Archaeological Database

With the friendly assistance of Mr. Gavin Whitelaw of the Natal Museum, the Museum's Archaeological Database Museum was accessed on 6 June 2016.

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ANNEXURE A

HERITAGE ASSESSMENT METHODOLOGY

The section below outlines the assessment methodologies to be utilised in the HIA.

The Heritage Impact Assessment (HIA) report to be compiled by PGS Heritage and Grave Relocation Consultants (PGS) for the proposed project will assess the heritage resources found on site. This report will contain the applicable maps, tables and figures as stipulated in the National Heritage Resources Act (NHRA) (no 25 of 1999), the National Environmental Management Act (NEMA) (no 107 of 1998) and the Minerals and Petroleum Resources Development Act (MPRDA) (28 of 2002). The HIA process consisted of three steps:

- Step I – Literature Review: The background information to the field survey leans greatly on the Heritage Scoping Report completed by PGS for this site.

- Step II – Physical Survey: A physical survey will be conducted on foot through the proposed project area by qualified archaeologists', aimed at locating and documenting sites falling within and adjacent to the proposed development footprint.

- Step III – The final step involves the recording and documentation of relevant archaeological resources, as well as the assessment of resources in terms of the heritage impact assessment criteria and report writing, as well as mapping and constructive recommendations

The significance of heritage sites is 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 - <10/50m^2
        - Medium - 10-50/50m^2
        - High - >50/50m^2
- **uniqueness** and
- **potential** to answer present research questions.

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

A - No further action necessary;
B - Mapping of the site and controlled sampling required;
C - No-go or relocate pylon position
D - Preserve site, or extensive data collection and mapping of the site; and
E - Preserve site

Site Significance

Site significance classification standards prescribed by the South African Heritage Resources Agency (2006) and approved by the Association for Southern African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, will be used for the purpose of this report.

Table 14: Site significance classification standards as prescribed by SAHRA

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

ANNEXURE B

THE SIGNIFICANCE RATING SCALES FOR THE EIA

Method of Assessing Impacts

The impact assessment methodology is guided by the requirements of the NEMA EIA Regulations (2010). The broad approach to the significance rating methodology is to determine the environmental risk (ER) by considering the consequence (C) of each impact (comprising Nature, Extent, Duration, Magnitude, and Reversibility) and relate this to the probability/ likelihood (P) of the impact occurring. This determines the environmental risk. In addition other factors, including cumulative impacts, public concern, and potential for irreplaceable loss of resources, are used to determine a prioritisation factor (PF) which is applied to the ER to determine the overall significance (S).

Determination of Environmental Risk

The significance (S) of an impact is determined by applying a prioritisation factor (PF) to the environmental risk (ER).

The environmental risk is dependent on the consequence (C) of the particular impact and the probability (P) of the impact occurring. Consequence is determined through the consideration of the Nature (N), Extent (E), Duration (D), Magnitude (M), and Reversibility (R) applicable to the specific impact.

For the purpose of this methodology the consequence of the impact is represented by:

$$C = \frac{(E+D+M+R)}{4} \times N$$

Each individual aspect in the determination of the consequence is represented by a rating scale as defined in Table 17.

Table 15: Criteria for determination of impact consequence.

Aspect	Score	Definition
Nature	- 1	Likely to result in a negative/ detrimental impact
	+1	Likely to result in a positive/ beneficial impact
Extent	1	Activity (i.e. limited to the area applicable to the specific activity)
	2	Site (i.e. within the development property boundary),
	3	Local (i.e. the area within 5 km of the site),
	4	Regional (i.e. extends between 5 and 50 km from the site
	5	Provincial / National (i.e. extends beyond 50 km from the site)
Duration	1	Immediate (<1 year)
	2	Short term (1-5 years),

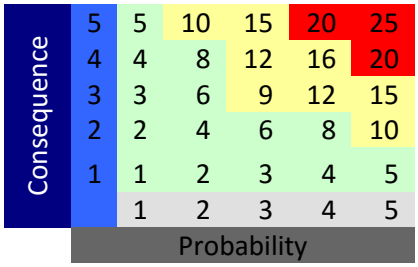
	3	Medium term (6-15 years),
	4	Long term (the impact will cease after the operational life span of the project),
	5	Permanent (no mitigation measure of natural process will reduce the impact after construction).
Magnitude/ Intensity	1	Minor (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected),
	2	Low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are slightly affected),
	3	Moderate (where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way),
	4	High (where natural, cultural or social functions or processes are altered to the extent that it will temporarily cease), or
	5	Very high / don't know (where natural, cultural or social functions or processes are altered to the extent that it will permanently cease).
Reversibility	1	Impact is reversible without any time and cost.
	2	Impact is reversible without incurring significant time and cost.
	3	Impact is reversible only by incurring significant time and cost.
	4	Impact is reversible only by incurring prohibitively high time and cost.
	5	Irreversible Impact

Once the C has been determined the ER is determined in accordance with the standard risk assessment relationship by multiplying the C and the P. Probability is rated/scored as per Table 19 below.

Table 16: Probability scoring.

Probability	1	Improbable (the possibility of the impact materialising is very low as a result of design, historic experience, or implementation of adequate corrective actions; <25%),
	2	Low probability (there is a possibility that the impact will occur; >25% and <50%),
	3	Medium probability (the impact may occur; >50% and <75%),
	4	High probability (it is most likely that the impact will occur- > 75% probability), or
	5	Definite (the impact will occur),

The result is a qualitative representation of relative ER associated with the impact. ER is therefore calculated as follows: ER= C x P.



The outcome of the environmental risk assessment will result in a range of scores, ranging from 1 through to 25. These ER scores are then grouped into respective classes as described in Table 19 below.

Table 17: Significance classes.

Environmental Risk Score	
Value	**Description**
< 9	Low (i.e. where this impact is unlikely to be a significant environmental risk),
≥9; <17	Medium (i.e. where the impact could have a significant environmental risk),
≥ 17	High (i.e. where the impact will have a significant environmental risk).

The impact ER will be determined for each impact without relevant management and mitigation measures (pre-mitigation), as well as post implementation of relevant management and mitigation measures (post-mitigation). This allows for a prediction in the degree to which the impact can be managed/ mitigated.

Impact Prioritisation

In accordance with the requirements of Regulation 31 (2)(l) of the EIA Regulations (GNR 543), and further to the assessment criteria presented in Section 0 it is necessary to assess each potentially significant impact in terms of:

- Cumulative impacts; and
- The degree to which the impact may cause irreplaceable loss of resources.

In addition it is important that the public opinion and sentiment regarding a prospective development and consequent potential impacts is considered in the decision making process.

In an effort to ensure that these factors are considered, an impact prioritisation factor (PF) will be applied to each impact ER (post-mitigation). This prioritisation factor does not aim to detract from the risk ratings but rather to focus the attention of the decision-making authority on the higher priority / significance issues and impacts. The PF will be applied to the ER score based on the assumption that relevant suggested management/ mitigation impacts are implemented.

Table 18: Criteria for the determination of prioritisation.

Public response (PR)	Low (1)	Not raised as a concern by the I&AP's
	Medium (2)	Issue/ impact raised by the I&AP's
	High (3)	Significant and meaningful response from the I&AP's
Cumulative Impact (CI)	Low (1)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikely that the impact will result in spatial and temporal cumulative change.
	Medium (2)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is probable that the impact will result in spatial and temporal cumulative change.
	High (3)	Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is highly probable/definite that the impact will result in spatial and temporal cumulative change.
Irreplaceable loss of resources (LR)	Low (1)	Where the impact is unlikely to result in irreplaceable loss of resources.
	Medium (2)	Where the impact may result in the irreplaceable loss (cannot be replaced or substituted) of resources but the value (services and/or functions) of these resources is limited.
	High (3)	Where the impact may result in the irreplaceable loss of resources of high value (services and/or functions).

The value for the final impact priority is represented as a single consolidated priority, determined as the sum of each individual criteria represented in Table 20. The impact priority is therefore determined as follows:

Priority = PR + CI + LR

The result is a priority score which ranges from 3 to 9 and a consequent PF ranging from 1 to 2 (refer to Table 21).

Table 19: Determination of prioritisation factor.

Priority	Ranking	Prioritisation Factor
= 3	Low	1
3 > 9	Medium	1.5
= 9	High	2

In order to determine the final impact significance the PF is multiplied by the ER of the post mitigation scoring. The ultimate aim of the PF is to be able to increase the post mitigation environmental risk rating by a full ranking class, if all the priority attributes are high (i.e. if an impact comes out with a medium environmental risk after the conventional impact rating, but there is significant cumulative impact potential, significant public response, and significant potential for irreplaceable loss of resources, then the net result would be to upscale the impact to a high significance).

Environmental Significance Rating	
Value	**Description**
< 9	Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
≥9; <17	Medium (i.e. where the impact could influence the decision to develop in the area),
≥ 17	High (i.e. where the impact must have an influence on the decision process to develop in the area).

For ease of use a template impact assessment form has been drafted which will need to be completed by each specialist for each relevant impact, and where necessary for each alternative. The significance ratings and additional considerations applied to each impact will be used to provide a quantitative comparative assessment of the alternatives being considered. In addition, professional expertise and opinion of the specialists and the environmental consultants will be applied to provide a qualitative comparison of the alternatives under consideration. This process will identify the best alternative for the proposed project.

ANNEXURE C

IMPACT ASSESSMENT SHEETS

While five project phases exist (Planning, Construction, Operation, Decommissioning and Rehab and Closure), only impact sheets for the Construction Phase are included here. The reason for this is that limited to no impacts are expected on the identified heritage issues during the other phases of the project. Please also note that although palaeontology was raised as a possible concern, its exact significance within the study area is not presently known. A palaeontologist will be appointed during the EIA phase to address this aspect. As a result, no impact assessment sheets will be completed for palaeontology.

Impact Name	Disturbance / Destruction of the Siege of Ladysmith				
Alternative	Not Applicable				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	4	3
Extent	5	4	Reversibility	5	5
Duration	5	5	Probability	4	2
Environmental Risk (Pre-mitigation)					-19.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-8.50
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-9.92

Impact Name	Disturbance/ Destruction of Battlefields				
Alternative	Not Applicable				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	4	3
Extent	5	4	Reversibility	5	5
Duration	5	5	Probability	4	2
Environmental Risk (Pre-mitigation)					-19.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-8.50
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-9.92

Impact Name	Disturbance / Destruction of Historic Settlements				
Alternative	**Not Applicable**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	4	3
Extent	4	4	Reversibility	5	5
Duration	5	5	Probability	4	2
Environmental Risk (Pre-mitigation)					-18.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-8.50
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-9.92

Impact Name	Disturbance/Destruction of Archaeological Sites				
Alternative	**Not Applicable**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	4	3
Extent	4	3	Reversibility	5	4
Duration	5	5	Probability	4	3
Environmental Risk (Pre-mitigation)					-18.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-11.25
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-13.13

Impact Name	Disturbance/Destruction of Historic Buildings or Structures				
Alternative	**Not Applicable**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	3	2
Extent	4	3	Reversibility	5	4
Duration	5	5	Probability	3	2
Environmental Risk (Pre-mitigation)					-12.75
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-7.00
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-8.17

Impact Name	Disturbance/ Destruction of Graves and Cemeteries				
Alternative	**Not Applicable**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	5	4
Extent	5	4	Reversibility	5	5
Duration	5	5	Probability	4	3
Environmental Risk (Pre-mitigation)					-20.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-13.50
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-15.75

Impact Name	Disturbance/ Destruction of Unmarked Graves				
Alternative	**Not Applicable**				
Environmental Risk					
Attribute	**Pre-mitigation**	**Post-mitigation**	**Attribute**	**Pre-mitigation**	**Post-mitigation**
Nature	-1	-1	Magnitude	5	4
Extent	5	4	Reversibility	5	5
Duration	5	5	Probability	3	3
Environmental Risk (Pre-mitigation)					-15.00
Mitigation Measures					
See above.					
Environmental Risk (Post-mitigation)					-13.50
Degree of confidence in impact prediction:					Medium
Impact Prioritisation					
Public Response					1
Low: Issue not raised in public responses					
Cumulative Impacts					1
Low: Considering the potential incremental, interactive, sequential, and synergistic cumulative impacts, it is unlikley that the impact will result in spatial and temporal cummulative change.					
Degree of potential irreplaceable loss of resources					2
Medium: Where the impact may result in the irreplaceable loss (cannot be replaced or subsitituted) of resources but the value (services and/or functions) of these resources is limited.					
Prioritisation Factor					1.17
Final Significance					-15.75