



**PHASE 1 HERITAGE IMPACT ASSESSMENT AND
DESKTOP PALAEOLOGICAL IMPACT ASSESSMENT:**

**RICHMOND CEMETERY LOCATED ON PORTION 2 OF THE FARM
RICHMOND COMMONAGE No. 5319 IN RICHMOND, RICHMOND
LOCAL MUNICIPALITY AND UMGUNGUNDLOVU DISTRICT
MUNICIPALITY, KZN.**

PREPARED FOR: RICHMOND LOCAL MUNICIPALITY

DATE: 18 NOVEMBER 2021

FINAL REPORT

Postal: PO Box 1170 Hilton, 3245

Physical: Block H, Quarry Office Park, 400 Old Howick Road, Hilton, 3245

Phone: 033 343 4176 **Fax:** 033 343 4201

Email: phillipa@greendoorgroup.co.za

Website: www.greendoorgroup.co.za

Independence

*Green Door Environmental follow a strict code of conduct which is guided by the **Section 12 & 13** of the National Environmental Management Act, Act 107 of 1998, which requires a specialist to be unbiased, independent and report on observations accurately.*

Copyright

*All intellectual property rights and copyright associated with **Green Door Environmental's** services and this report are reserved. Project deliverables and reports may not be modified or incorporated into subsequent reports, in any form or by any means, without the authorised written consent of the Director. The report, if the results, recommendations, mapping or conclusions stated in this report are used in subsequent documentation, should be duly acknowledged and appropriately referenced.*

*Should this report comprise a specialist study to an overarching study, it is **Green Door Environmental's** right to request that this report be included in its entirety as an Appendix to the main report.*

General Terms

The scope and ambit of this Report is set out in the Terms of Reference below and this report is limited in respect thereof only.

*The project deliverables, including the reported results, comments, recommendations and conclusions in this report are based on **Green Door Environmental's** professional knowledge as well as the information made available to **Green Door Environmental**.*

*The study is based on assessment techniques and investigations that are limited by time, the information made available to **Green Door Environmental**, budgetary constraints imposed on **Green Door Environmental** and the level of survey undertaken as a result as well as the mandate and terms of appointment of **Green Door Environmental**.*

***Green Door Environmental** therefore reserve the right to modify, supplement and/or amend aspects of the project deliverables should new and/or additional information become available. The source thereof could be from research or additional studies in the applicable field of practice.*

***Green Door Environmental** exercise all reasonable skill, care and diligence in the provision of services and the preparation and compiling of this report. This report is provided on the basis that **Green Door Environmental** shall not be liable for any damages, or expense or cost as a result of the use by any person of the report and any information contained herein.*

*The client, including their agents, by receiving these deliverables indemnifies **Green Door Environmental** (including directors, employees and sub-consultants) against any actions, claims, demands, losses, liabilities, costs, damages and expenses arising directly or indirectly from or in connection with services rendered under the specified appointment.*

Date:	18 November 2021
Document Title:	Richmond Cemetery: Phase 1 Heritage Impact Assessment & Desktop Palaeontological Impact Assessment
Author:	Dr Phillipa Harrison
Review:	Dr Rebecca Bowd
Report Prepared For:	Richmond Local Municipality

I, Dr Phillipa Harrison, declare that –

General declaration:

- I act as the independent specialist in this application in terms of Section 12 and 13 of the regulations;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature:



Dr. Phillipa Harrison - BA Hons (Archaeology); PhD (Geog Sci); Reg - APASA
ENVIRONMENTAL CONSULTANT / ARCHAEOLOGIST
Tel: (033) 343-4176
Email: phillipa@greendoorgroup.co.za

Refer to Appendix A for the CV of the Heritage Consultant

EXECUTIVE SUMMARY

Green Door Environmental was appointed on behalf of the Richmond Local Municipality to conduct a Phase 1 Heritage Impact Assessment (HIA) and Desktop Palaeontological Impact Assessment (PIA) for the proposed establishment of a cemetery located on Portion 2 of the Farm Richmond Commonage No. 5319 in Richmond, Richmond Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. The proposed cemetery site is approximately 18ha in extent and as such, a Phase 1 HIA is being undertaken as per the requirements of Section 38(8) of the National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999) (as amended), and the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998). The proposed cemetery site is located within an area that is designated as 'moderately sensitive' in terms of fossil sensitivity according to the SAHRIS palaeo-sensitivity map. As such a desktop PIA is also required for the proposed cemetery development project.

The proposed cemetery site is accessed off the R56 Road and is located approximately 2.5km south of the Richmond Town CBD, adjacent to the Richmond Country Club and Golf Course. Topographically, the site slopes gently towards the west. Approximately 60% of the site is currently forested and comprises commercial timber plantations, while approximately 40% of the site comprises mowed secondary grassland areas. The property is surrounded by commercial forestry plantations and the Ndaleni township to the west and south west, along with a landfill site and the Anderson's filling station situated nearby. There is also a small informal cemetery located approximately 220m to the north east of the study site. This small cemetery is fenced off and is currently being used by the surrounding local community for burials.

The development site is underlain by Permian aged sedimentary rocks of the Pietermaritzburg Formation, of the Ecca Group and the Karoo Supergroup. In the general study area, the Pietermaritzburg Formation is highly weathered and as a result, the likelihood of fossils being present on the development footprint is low.

The Phase 1 HIA included a desktop assessment and review of relevant current and historical aerial imagery of the study site. The SAHRIS website and Provincial Heritage Register were consulted for data on the presence and significance of any heritage sites within the general project area and immediate surrounds. In addition, the available heritage literature covering the larger study area was also consulted. The Desktop PIA included the consultation of the relevant geological maps, paleontological databases, records, relevant literature and existing paleontological assessment studies for the larger study area, to determine the likelihood of fossils being present within the development site and immediate surrounds.

A ground survey of the study site was conducted on the 14th November 2021 following standard archaeological survey procedures. The consultant liaised with local community members encountered at the study site, as well as the caretaker at the informal cemetery situated near to the study site, however none of the persons interviewed were aware of the presence of any graves outside of the boundary of the informal cemetery site, or other heritage resources within the development footprint.

No heritage resources were identified on the proposed cemetery development footprint during the Phase 1 HIA and Desktop PIA, and the site does not form part of any known cultural or heritage landscape. Due to the highly weathered nature of the bedrock, no well preserved fossils are expected

to be present on the study site. As such, the proposed cemetery development may proceed on the identified site subject to the recommendations as contained in Section 11 of this Report.

CONTENTS

1	INTRODUCTION AND DEVELOPMENT BACKGROUND	1
2	SCOPE OF THE ASSESSMENT	1
3	ASSUMPTIONS AND LIMITATIONS	2
4	LEGISLATIVE REQUIREMENTS	2
4.1	NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) 1998 (ACT 107 OF 1998).....	2
4.2	NATIONAL HERITAGE RESOURCES ACT (NHRA) 1999 (ACT 25 OF 1999).....	2
4.3	THE KWAZULU-NATAL HERITAGE ACT 2008 (ACT 4 OF 2008).....	3
4.4	MINIMUM STANDARDS FOR HERITAGE SPECIALIST STUDIES	3
4.5	MANAGEMENT OF GRAVES, BURIAL GROUNDS AND CEMETERIES	4
5	STUDY METHODOLOGY.....	5
5.1	DESKTOP ASSESSMENT.....	5
5.2	GROUND SURVEY	5
6	PROJECT DESCRIPTION AND LOCALITY	6
7	CULTURAL OVERVIEW OF THE STUDY AREA	9
8	GEOLOGY AND PALAEOLOGY	9
9	ASSESSMENT RESULTS	11
9.1	DESKTOP STUDY.....	11
9.2	GROUND SURVEY	14
9.3	SITE SIGNIFICANCE AND FIELD RATING	16
9.4	PALAEOLOGY.....	16
10	IMPACT ASSESSMENT.....	16
11	CONCLUSION AND RECOMMENDATIONS.....	18
12	REFERENCES	19

APPENDICES

- Appendix A: Short CV of Heritage Consultant
Appendix B: Site Photographs
Appendix C: Chance Find Procedures for Heritage / Palaeontological Resources

LIST OF ABBREVIATIONS

CBD	Central Business District
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
NEMA	National Environmental Management Act

NHRA	National Heritage Resources Act
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System

RICHMOND CEMETERY: PHASE 1 HERITAGE IMPACT ASSESSMENT AND DESKTOP PALAEOLOGICAL IMPACT ASSESSMENT

1 INTRODUCTION AND DEVELOPMENT BACKGROUND

Green Door Environmental was appointed on behalf of the Richmond Local Municipality to conduct a Phase 1 Heritage Impact Assessment (HIA) and Desktop Palaeontological Impact Assessment (PIA) for the proposed establishment of a cemetery located on Portion 2 of the Farm Richmond Commonage No. 5319 in Richmond, Richmond Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. The proposed cemetery site is accessed off the R56 Road and is located at GPS coordinates S29°53'46.28" and E30°16'36.50", approximately 2.5km to the south of the Richmond Town CBD.

The existing cemetery site within the Richmond Local Municipality is nearing full capacity and this has put the Municipality under strain to establish a new cemetery. The proposed new cemetery will include sites for child, adult and pauper graves, an administration office, ablutions, parking and drop-off points, internal road network and a garden of remembrance. The proposed cemetery site is approximately 18ha in extent.

The Phase 1 HIA and Desktop PIA forms part of the Environmental Authorisation process under the National Environmental Management Act (NEMA) 1998 (Act 107 of 1998) for the proposed establishment of the Richmond Cemetery. The proposed cemetery development triggers Listed Activities in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (amended 2017) under NEMA 1998 (Act 107 of 1998) for which a Basic Assessment Process is required. This Phase 1 HIA and Desktop PIA is therefore undertaken in terms of Section 38(8) of the National Heritage Resources Act (NHRA) 1999 (Act 25 of 1999).

2 SCOPE OF THE ASSESSMENT

The Phase 1 HIA and Desktop PIA aims to locate, identify and assess the significance of any heritage resources, including archaeological and palaeontological deposits/sites, built structures older than 60 years, burial grounds and graves, graves of victims of conflict and basic cultural landscapes and viewsapes, as defined and protected by the NHRA.

As per the requirements set out in Section 38(3) of the NHRA, the key terms of reference for the Phase 1 HIA were as follows:

- The identification and mapping of all heritage resources in the study area.
- Undertaking an assessment of the significance of such resources in terms of the heritage assessment criteria set out in Section 6(2) and/or Section 7 of the NHRA.
- Undertaking an assessment of the impact of the proposed development on the identified heritage resources.

- An evaluation of the impact of the proposed development on such identified heritage resources relative to the sustainable social and economic benefits to be derived from the development.
- Reporting on the results of the consultation with communities affected by the proposed development and other interested parties regarding the impact of the development on heritage resources.
- The consideration of alternatives should any heritage resources potentially be adversely affected by the proposed development.
- The compilation of plans for mitigating of any adverse effects during and after the completion of the proposed development.

In addition to the above, the primary aim of the Desktop PIA was to undertake a review of all relevant palaeontological and geological literature including maps and previous palaeontological impact reports for the general study area, to predict the potential for the occurrence of buried fossil heritage within the development footprint.

3 ASSUMPTIONS AND LIMITATIONS

It is difficult to apply pure scientific methods within a natural environment without limitations or assumptions. The following apply to this study:

- Heritage site visibility may have been compromised by the presence of the timber plantations that cover approximately 60% of the study site, as well as in areas of dense vegetation.
- Heritage/palaeontological resources may be present below the surface. No subsurface investigations were undertaken as part of the Phase 1 HIA and Desktop PIA.
- The findings, results, observations, conclusions and recommendations provided in this report are based on the authors' best scientific and professional knowledge as well as available information regarding the perceived impacts on heritage/palaeontological resources.
- The study results are based on a single day field investigation conducted during early summer. Once-off assessments such as this may potentially miss certain heritage information, thus limiting accuracy, detail and confidence.
- Any additional information used to inform the assessment was limited to data and GIS data sets which were available for the area at the time of assessment.

4 LEGISLATIVE REQUIREMENTS

4.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (NEMA) 1998 (ACT 107 OF 1998)

This Phase 1 HIA and Desktop PIA has been undertaken in compliance with the requirements for specialist studies as contained in the EIA Regulations 2014 (amended 2017) under NEMA, as outlined in Appendix 6 of GNR 326 which provides the requirements for specialist reports, and Section 13 of GNR 326 which provides the general requirements for Environmental Assessment Practitioners (EAPs) and specialists.

4.2 NATIONAL HERITAGE RESOURCES ACT (NHRA) 1999 (ACT 25 OF 1999)

The NHRA makes provisions for the management and protection of heritage resources on a national level in South Africa. Section 3(1-3) of the NHRA defines those heritage resources in South Africa which form part of the national estate due to their cultural significance or other special value for the

present community and future generations. Such resources include places, buildings, structures, equipment, oral traditions, historical settlements, townscapes, landscapes, geological sites, archaeological and palaeontological sites, graves and burial grounds and movable objects. Section 4 of the NHRA establishes both the national and provincial systems for the management of heritage resources within the country.

Section 7(1) of the NHRA provides for a three-tier management system which operates at a national, provincial and local level and distinguishes between three categories for the grading of places and objects which form part of the national estate, as follows:

- National (Grade I) heritage resources, which are resources that are regarded as being of national significance, and are managed at a national level by SAHRA;
- Provincial (Grade II) heritage resources, which have provincial or regional significance and are managed by provincial heritage resources authorities; and
- Local (Grade III) heritage resources which are the responsibility of local authorities.

Sections 34, 35 and 36 of the NHRA provides for the protection of heritage resources from damage, destruction or alteration. Section 38 of the NHRA sets out the requirements for heritage resources management, specifically in relation to the undertaking of developments, and the need and requirements for impact assessment studies and reports.

4.3 THE KWAZULU-NATAL HERITAGE ACT 2008 (ACT 4 OF 2008)

The KwaZulu-Natal Heritage Act provides for the conservation, protection and administration of both the physical and living or intangible heritage resources of the Province of KwaZulu-Natal. The Act is implemented by Amafa KwaZulu-Natal, the provincial heritage resources authority in the province.

Chapter 8 of the Act provides for the general protection of heritage resources, specifically the general protection of structures older than 60 years, graves of victims of conflict, traditional burial places, battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite and meteorite impact sites. Chapter 9 of the Act provides for the special protection of heritage resources including the special protection of heritage landmark and provincial landmark sites and heritage objects. Chapter 10 of the Act provides for the management of heritage resources and determination of criteria for best practise, standards, norms and conditions.

4.4 MINIMUM STANDARDS FOR HERITAGE SPECIALIST STUDIES

Lastly, the South African Heritage Resources Agency (SAHRA) Minimum Standards for Heritage Specialist Studies (2007, 2016) in terms of Section 38(1) and 38(8) of the NHRA outlines the requirements for Phase 1 HIA studies, including the requirements for Phase 1 HIA Reports and provides a standardised site significance and field rating methodology.

Table 1 below outlines the legislative requirements applicable to the proposed Richmond Cemetery Phase 1 HIA and Desktop PIA study.

Table 1: Applicable Legislative Requirements

Legislation	Relevant Section	Description
EIA Regulations 2014 (amended 2017) under NEMA 1998 (Act 107 of 1998)	GNR 327 Part 23	<i>"The development of cemeteries of 2500 square metres or more in size".</i>
	GNR 327 Part 27	<i>"The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i>
NHRA 1999 (Act 25 of 1999)	Section 38(1)	<i>"Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as – (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length; (b) the construction of a bridge or similar structure exceeding 50 m in length; (c) any development or other activity which will change the character of a site - (i) exceeding 5 000 m2 in extent; or (ii) involving three or more existing erven or subdivisions thereof; or (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority; (d) the re-zoning of a site exceeding 10 000 m2 in extent; or (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development."</i>
	Section 38(8)	<i>"The provisions of this section do not apply to a development as described in subsection (1) if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989), or the integrated environmental management guidelines issued by the Department of Environment Affairs and Tourism, or the Minerals Act, 1991 (Act No. 50 of 1991), or any other legislation: Provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent."</i>

4.5 MANAGEMENT OF GRAVES, BURIAL GROUNDS AND CEMETERIES

As the proposed development entails the establishment of a cemetery, and an informal cemetery has been identified in close proximity to the development site, legislation concerning the protection and management of graves, burial grounds and cemeteries is relevant to this project, as outlined below.

Section 2 of the NHRA defines a grave as *"a place of interment and includes the contents, headstone or other marker of such a place, and other structure on or associated with such place"*. The KwaZulu-

Natal Cemeteries and Crematoria Act 1996 (Act 12 of 1996) defines a grave as “an excavation in which human remains have been intentionally placed for the purposes of burial, but excludes any such excavation where all human remains have been removed” and a burial ground as “two or more graves that are grouped closely enough to be managed as a single entity”. Sections 34 and 35 of the KwaZulu-Natal Heritage Act and Section 36 of the NHRA provides for the protection of graves of victims of conflict, traditional burial places and cemeteries and graves and burial grounds older than 60 years.

No person may damage, alter, exhume or remove from its original position any grave without the permission of the relevant authorities as listed in Table 2 below.

Table 2: Protection of Graves, Burial Grounds and Cemeteries in KwaZulu-Natal

Description	Relevant Section	Relevant Authority
Graves contained within a formalised cemetery.	KwaZulu-Natal Cemeteries and Crematoria Act 1996 (Act 12 of 1996)	Department of Health
Graves that are younger than 60 years that are located outside of a formalised cemetery, and the graves of the victims of conflict.	KwaZulu-Natal Heritage Act 2008 (Act 4 of 2008)	Amafa KwaZulu-Natal
Graves older than 60 years located outside of a formalised cemetery.	National Heritage Resources Act 1999 (Act 25 of 1999)	SAHRA

5 STUDY METHODOLOGY

5.1 DESKTOP ASSESSMENT

An initial desktop assessment and review of relevant current and historical aerial imagery of the study site was undertaken at the start of the project. Historical imagery was obtained from the Department of Rural Development and Land Reform and the National Geospatial Information website (<http://cdngiportal.co.za/cdngiportal/>). The SAHRIS website and Provincial Heritage Register were consulted for data on the presence and significance of any heritage sites within the Richmond Local Municipal area. In addition, the available heritage literature covering the larger study area was also consulted.

The methods employed for the Desktop PIA included the consultation of the relevant geological maps, paleontological databases, records, relevant literature and existing paleontological assessment studies for the larger study area, to determine the likelihood of fossils being present within the development site and immediate surrounds. The study also made use of the site specific specialist Geotechnical Investigation Report (Gondwana Geo Solutions, Oct 2021) and the Geohydrological Assessment Report (GCS Water and Environmental Consultants, Nov 2021) to determine the geology and soil characteristics of the study site.

5.2 GROUND SURVEY

A ground survey of the study site was conducted on the 14th November 2021 which comprised a walkover and visual survey of the development footprint, where vegetation density and terrain allowed. The assessment was done by foot and limited to a Phase 1 visual survey. Geographic coordinates were taken using a handheld Garmin Etrek GPS unit (Datum: WGS84). All readings were

taken using the GPS unit, and accuracy was to a level of 5m. Photographic documentation of the site was undertaken using a Huawei P20 Smartphone camera. Ground visibility was generally good but was compromised in the areas of the site that comprise the *Eucalyptus* timber plantations (south western portion of the site). Archaeological and cultural heritage site recording, significance assignment and associated mitigation recommendations were done according to the field rating system prescribed by SAHRA (2007, 2016).

The Consultant also liaised with local community members encountered at the study site during the ground survey, as well as the caretaker at the informal cemetery situated nearby the study site. None of the persons interviewed were aware of the presence of any graves outside of the boundary of the informal cemetery site, or other heritage resources within the development footprint.

The relevant site photographs are included in Appendix B.

6 PROJECT DESCRIPTION AND LOCALITY

The proposed 18ha cemetery development site is located in the southern portion of the property Portion 2 of the Farm Richmond Commonage No. 5319 in the Richmond area of KwaZulu-Natal. Portion 2 of the Farm Richmond Commonage is 445ha in extent and is registered to the Richmond Local Municipality. The property comprises a mix of *Eucalyptus* timber plantations, secondary grassland areas which are used as recreational polo fields, and the Richmond Country Club and golf course. There is an existing informal cemetery site which is located in the eastern portion of the property and which has been fenced off and is currently being used by the surrounding local community for burials. The fenced off cemetery site covers an area of approximately 2500m² and burials having been taking place at the site for approximately one year. This existing cemetery area is located approximately 220m to the north east of the proposed Richmond Cemetery development footprint.

The proposed cemetery site is accessed off the R56 Road and is located approximately 2.5km south of the Richmond Town CBD. Topographically, the site slopes gently towards the west. Approximately 60% of the site is currently forested with *Eucalyptus* timber plantations, while approximately 40% of the site comprises mowed secondary grassland areas. There are no built structures present on the 18ha development footprint. The cemetery development site is surrounded by commercial forestry plantations and the Ndaleni township to the west and south west, along with a landfill site and the Anderson's filling station situated nearby.

Table 3 below provides the details of the general project area and the specifics of the development, while Figures 1 and 2 below provide locality maps.

Table 3: Details of the General Project Area and Development Specifics

Property description	Portion 2 of the Farm Richmond Commonage No. 5319
Magisterial District	Richmond Local Municipality and uMgungundlovu District Municipality
1: 50 000 map sheet number	2930CD
Central co-ordinate of the development	S29°53'46.28" and E30°16'36.50"
Type of development	Cemetery
Property zoning	Current zoning is Agriculture 2 and Active Open Space. To be re-zoned to Cemetery.

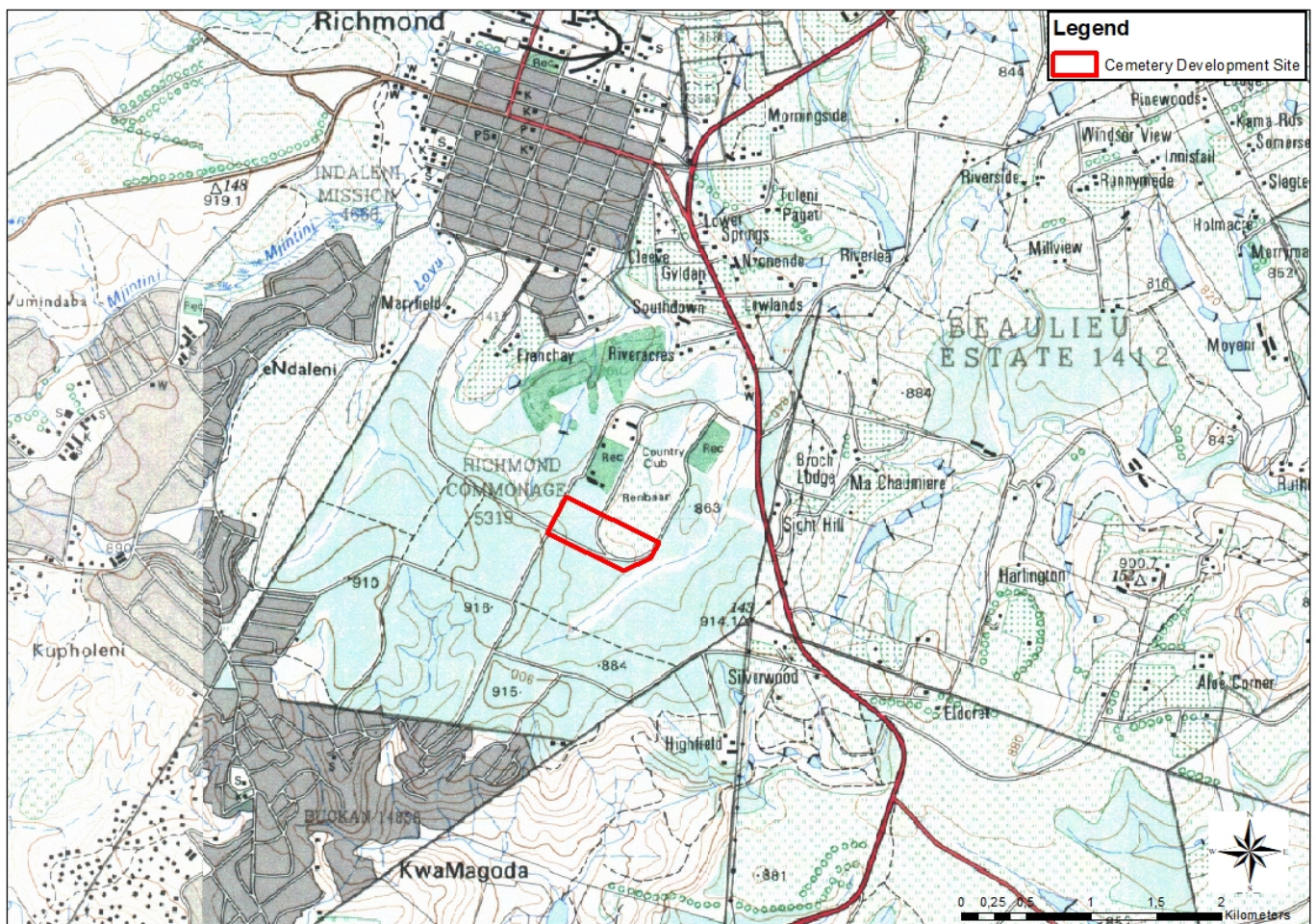


Figure 1: Topographical Map of the proposed Richmond Cemetery Development Site.

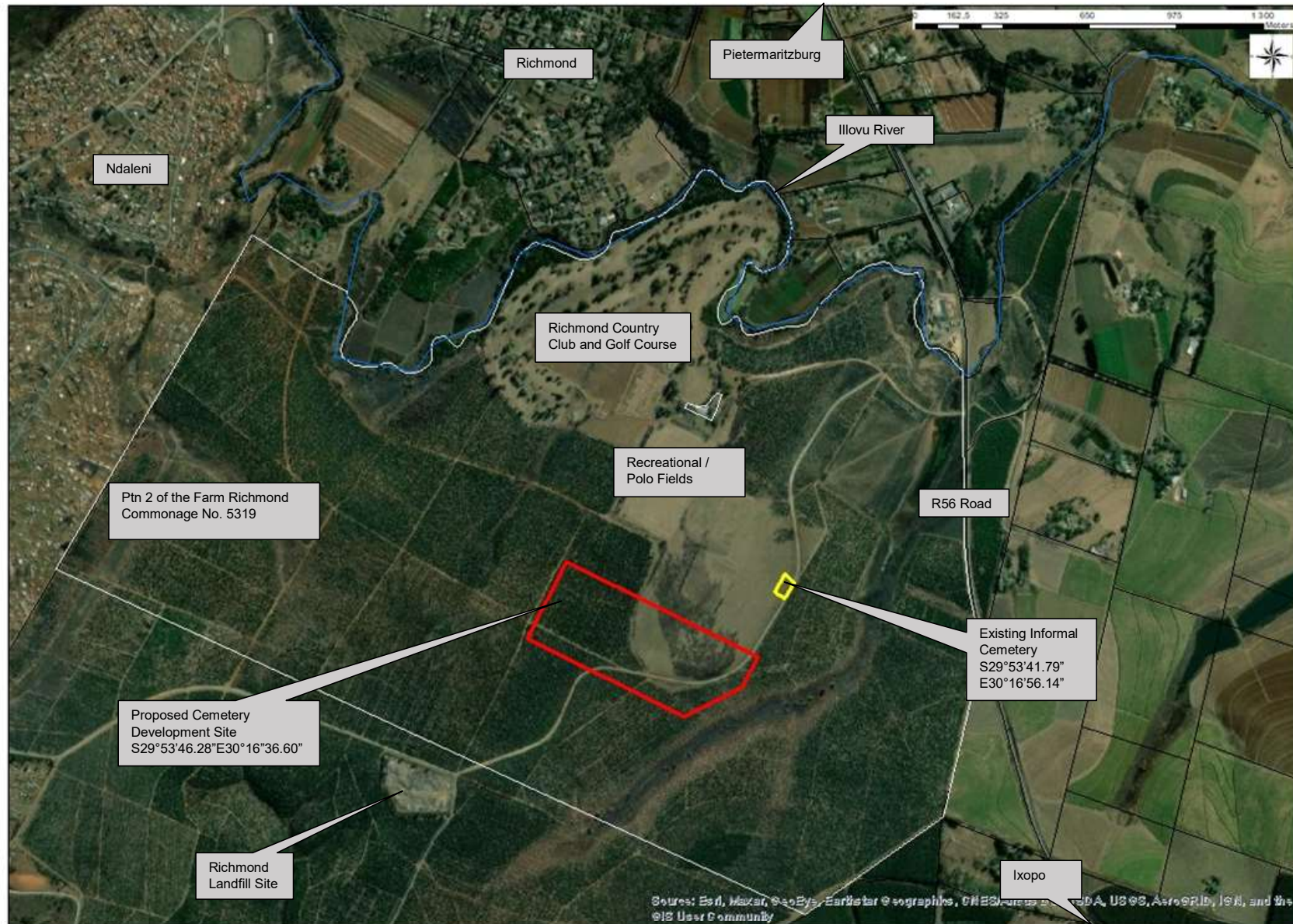


Figure 2: Locality Map of the Study Area.

7 CULTURAL OVERVIEW OF THE STUDY AREA

The town of Richmond is situated on the banks of the upper Illovo River in the midlands area of KwaZulu-Natal, approximately 38km south west of Pietermaritzburg. Richmond was established in 1850 as Beaulieu-on-Illovo by British Byrne Settlers who were originally from New Forest / Beaulieu in Hampshire (Coulson 1986).

Sporadic heritage surveys have previously been undertaken in the greater Richmond area by archaeologists from the then Natal Museum. While the area has never been extensively surveyed for archaeological and heritage sites, some sites have been recorded by heritage resource consultants and the KwaZulu-Natal Museum. A range of sites can be expected in the greater Richmond area including Early, Middle and Later Stone Age sites and a number of Iron Age sites. A number of colonial-era buildings and farmsteads associated with the Victorian and Edwardian periods are also present within the Richmond town and surrounding areas. All of these sites are protected by heritage legislation.

8 GEOLOGY AND PALAEOLOGY

The palaeontological sensitivity of the study site as per the SAHRIS palaeo-sensitivity map is shown in Figure 3 below. The SAHRIS paleo-sensitivity map shows the area as “moderately sensitive” in terms of fossil sensitivity.

The 2930 Durban 1:250 000 Geological map series (Council for Geosciences) was used to identify the general geology of the study area, as shown in Figure 4 below. The local geology of the larger study area is characterised by shale, mudstone and sandstones of the Pietermaritzburg Formation, of the Ecca Group, of the Karoo Supergroup.

The entire site is underlain by Permian aged sedimentary rocks of the Pietermaritzburg Formation, which is characterised by shale and mudstone that can vary from dark grey to yellow-brown, dependent on the degree of weathering. The Pietermaritzburg Formation comprises a deep marine shale deposit (Groenewald 2018). In the general study area, the Pietermaritzburg Formation is highly weathered, and as a result, the likelihood of fossils being present on the development footprint is low. Several trace fossils have been recorded in the upper part of the Pietermaritzburg Formation and plant fossils are known to occur in areas closer to Pietermaritzburg where less weathered outcrops of the Pietermaritzburg Formation occur (Groenewald 2018).

According to the findings of the specialist Geotechnical Investigation (Gondwana, Oct 2021), the development site geology is characterised by a relatively thick mantle of transported (colluvial) and residual soils, overlaying the shale bedrock. Transported colluvial soils can be expected to occur to an average depth of 0.5m below existing ground level (mbegl), while residual soils, derived from the complete insitu weathering of the shale bedrock, are located beneath the transported soils, between a depth of 1.9 to 2.5 mbegl or deeper. The shale bedrock occurs at depths of between 1.9 to 2.7 mbegl. The shale bedrock can be described as light grey completely weathered, and very soft rock, grading into soft rock in strength with depth. No shallow rock outcrop areas are present on the surface of the development site.

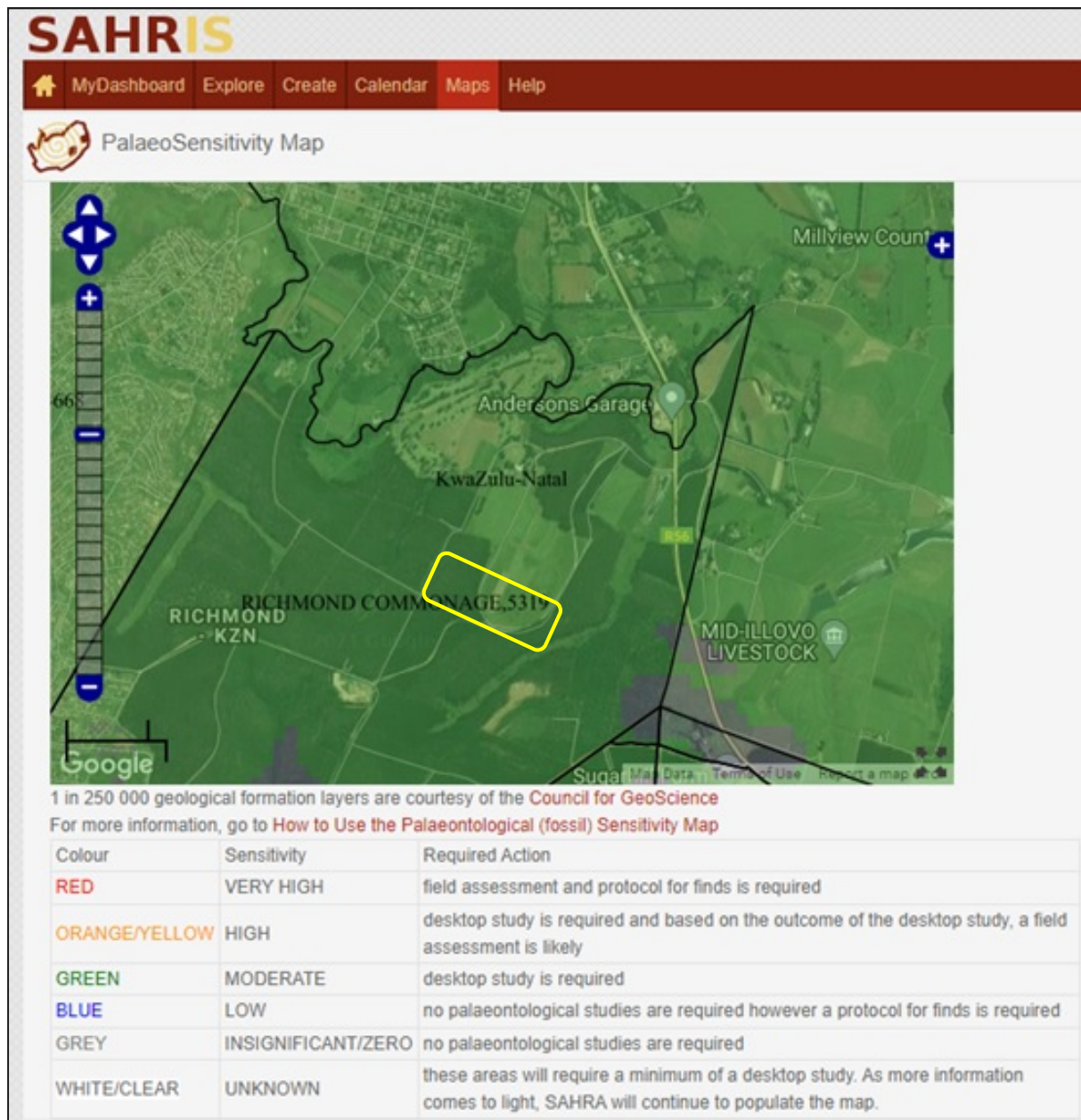


Figure 3: SAHRIS Palaeo-Sensitivity Map for the Study Site (SAHRIS).

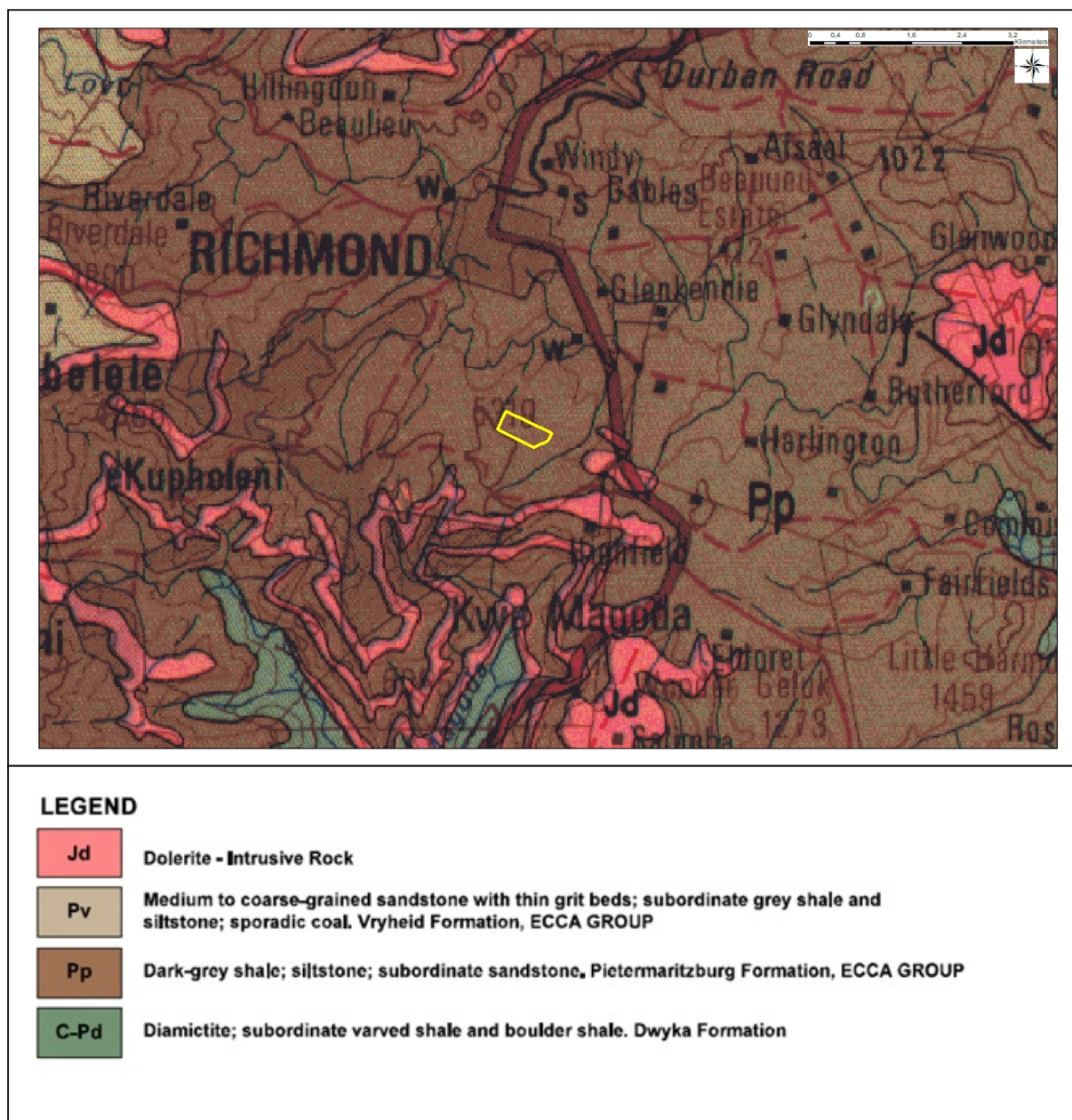


Figure 4: Regional Geology of the Study Area (Council for Geosciences).

9 ASSESSMENT RESULTS

9.1 DESKTOP STUDY

An investigation into historical aerial imagery of the development site was undertaken. Aerial imagery from 1973, 1978 and 1989 (Figures 5 – 7) shows that the development site has a long history of agricultural use and associated anthropogenic disturbance, with no evidence of built structures or other historical development present on the site.



Figure 5: Historic Aerial Imagery of the Development Site from 1973.



Figure 6: Historic Aerial Imagery of the Development Site from 1978.



Figure 7: Historic Aerial Imagery of the Development Site from 1989.

Table 4 below lists the provincial heritage sites listed for the Richmond Municipal area. The closest registered heritage sites from the Provincial Heritage Register occur approximately 2.3km to the north of the development site within the Richmond town and comprise the Richmond and Byrne District Museum and the Carnarvon Masonic Lodge as shown in Figure 8 below.

Table 4: Declared Provincial Heritage Site for the Richmond Municipal Area

Legislation	Relevant Section	Description
9/2/440/0001	Blarney Cottage, Farm Dunbar Estate	29°50'48.02"S 30°12'42.71"E
9/2/440/0007	Carnarvon Masonic Lodge	29°52'29.12"S 30°16'38.64"E
9/2/440/0010	Richmond and Byrne District Museum	29°52'31.20"S 30°16'41.98"E
9/2/440/0011	Baynes House	29°45'51.18"S 30°20'30.34"E
9/2/440/0012	First Cattle Dip	29°45'24.17"S 30°16'6.50"E
9/2/440/0013	Old Nel's Rust Dairy	29°45'51.26"S 30°20'30.58"E
9/2/440/0014	Joseph Baynes Mausoleum	29°45'56.07"S 30°20'28.53"E
9/2/440/0015	Lynmouth Glacial Pavement	29°48'56.46"S 30°24'30.12"E



Figure 8: Provincial Heritage Sites identified within the vicinity of the Richmond Cemetery Development Site.

9.2 GROUND SURVEY

No development activities associated with the proposed establishment of the Richmond Cemetery had begun at the time of the ground survey. No heritage resources were identified on or directly adjacent to the 18ha cemetery development footprint as outlined in Table 5 below. As there is an informal cemetery located approximately 220m to the north east of the development site, special care was taken to locate any graves on the development footprint. However no graves were identified on or within the immediate vicinity of the development site.

Table 5: List of Possible Heritage Resources and Assessment Findings

Heritage Resource Type	Finding
Places, buildings, structures and equipment of cultural significance	None
Places to which oral traditions are attached or which are associated with living heritage	None
Historical settlements and townscapes	None
Landscapes and natural features	None
Geological sites of scientific or cultural importance	None
Archaeological and palaeontological sites	None
Graves and burial grounds	None were identified within the development footprint and immediate surrounds. There is a cemetery located approximately 220m from the development site.
Public monuments and memorials	None
Sites of significance relating to the history of slavery in South Africa	None
Movable objects	None

An assessment in terms of the significance criteria outlined in Section 3(3) of the NHRA was also undertaken for the study site as part of the Phase 1 HIA, as shown in Table 6 below.

Table 6: Evaluation of Heritage Sites or Objects in terms of Section 3(3) of the NHRA

Significance criteria for heritage sites or objects in terms of Section 3(3) of the NHRA 1999 (Act 25 of 1999)	Rating
Importance in the community, or pattern of South Africa's history.	Negligible
In possession of uncommon, rare or endangered aspects of South Africa's natural or cultural heritage.	Negligible
Has potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage.	Negligible
Importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects.	Negligible
Importance in exhibiting particular aesthetic characteristics valued by a community or cultural group;	Negligible
Importance in demonstrating a high degree of creative or technical achievement at a particular period.	Negligible
Has a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.	Negligible
Has a strong or special association with the life or work of a person, group or organisation of importance in the history of South Africa.	Negligible
Sites of significance relating to the history of slavery in South Africa.	Negligible

9.3 SITE SIGNIFICANCE AND FIELD RATING

The field rating system (Table 7) as developed by SAHRA (2007, 2016) does not apply to the proposed Richmond Cemetery development as no heritage sites occur on, or directly adjacent to the development footprint.

Table 7: Site Significance and Field Rating (SAHRA 2007, 2016)

Level	Description	Action
Grade I National Resource	This site is considered to be of National significance.	Nominated to be declared by SAHRA and maintained in situ.
Grade II Provincial Resource	This site is considered to be of Provincial significance.	Nominated to be declared by Provincial Heritage Authority and maintained in situ.
Grade IIIA Local Resource	This site is considered to be of a High significance locally.	The site must be retained as a heritage register site.
Grade IIIB Local Resource	This site is considered to be of a High/Medium significance locally.	The site must be mitigated and part retained as a heritage register site.
Grade IIIC Local Resource	This site is considered to be of a Low significance locally.	The site needs to be recorded but may be granted destruction authorisation at the discretion of the relevant heritage authority.
Generally Protected A	High to medium significance	Mitigation necessary before destruction.
Generally Protected B	Medium significance	Site to be recorded before destruction.
Generally Protected C	Low significance	Site has been sufficiently recorded (in the Phase 1). It requires no further recording before destruction.

9.4 PALAEOLOGY

The “moderate sensitivity” in terms of the SAHRIS palaeo-sensitivity is applicable to the entire study site. The excavations for the cemetery will expose some sediments of the Pietermaritzburg Formation. However, due to the highly weathered nature of the bedrock, no well preserved fossils are expected to be present on the study site. In addition, due to the nature of the development (cemetery), it is unlikely that bedrock will be exposed during excavations. However, should bedrock be exposed as a result of the cemetery operation, this may result in the exposure of plant or trace fossils of the Pietermaritzburg Formation. As such, a chance find protocol has been included in Appendix C.

10 IMPACT ASSESSMENT

Any development or anthropogenic activity in a natural system will have an impact on the surrounding environment, usually in a negative way. The assessment criteria as outlined in Table 8 below have been used to identify, predict and assess the significance of any potential heritage and palaeontological related impacts associated with the proposed Richmond Cemetery development.

As no heritage sites or resources have been identified on the development footprint or immediate surrounds; the area is not part of any known cultural landscape; and it is highly unlikely that fossils are present within the cemetery site footprint; the proposed activity poses a minimal risk to heritage and palaeontological resources, as shown in Table 9 below.

Table 8: Summary of Aspects used for Assessing Heritage / Palaeontological Impacts

Aspect	Rating	Description
Nature	Positive	The impact on the resource will be positive.
	Negative	The impact on the resource will be negative.
Probability (with mitigation)	Definitely	The impact will definitely occur even with mitigation (100%).
	Likely	It is likely that the impact will occur (60%-99%).
	Fair	There is a fair chance that the impact will occur (30% -59%).
Reversibility (with mitigation)	Unlikely	It is unlikely that the impact will occur (0% - 29%).
	Possible	It is possible to reverse the impact.
	Partly	It is partly possible to reverse the impact.
Extent	Not possible	It is not possible to reverse the impact.
	Site	The impact will be limited to the site.
	Local	The impact will affect the local area (within a radius of 40km).
	Provincial	The impact will affect areas beyond the site but within the boundaries of KwaZulu-Natal.
Duration	National	The impact will affect areas beyond the Province but within the boundaries of South Africa.
	Short-term	0-5 years (construction phase).
	Medium-term	5-40 years (construction and operation).
	Long-term	(>40 years).
Significance of Impact without Mitigation	Permanent	Permanent damage to the environment.
	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.
Significance of Impact Post-Mitigation	High	Significant impact / disturbance expected.
	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.

Table 9: Impact Assessment Results for the Richmond Cemetery Site

Aspect	Rating	Description
Nature	Positive	-
	Negative	While it is highly unlikely that impacts to fossils or heritage resources will occur, any impacts resulting from the cemetery development will be negative.
Probability (with mitigation)	Definitely	-
	Likely	-
	Fair	-
	Unlikely	It is unlikely that the impact will occur (0% - 29%).
Reversibility (with mitigation)	Possible	-
	Partly	-
	Not possible	It is not possible to reverse the impact.
Extent	Site	The impact will be limited to the site.
	Local	-
	Provincial	-
	National	-
Duration	Short-term	-
	Medium-term	-
	Long-term	-
	Permanent	Permanent damage to the environment.
Significance of Impact without Mitigation	Low	Small impact / disturbance.
	Medium	-
	High	-
Significance of Impact Post-Mitigation	Low	Small impact / disturbance.
	Medium	-
	High	-

11 CONCLUSION AND RECOMMENDATIONS

The Phase 1 HIA for the proposed establishment of the Richmond Cemetery on Portion 2 of the Farm Richmond Commonage No. 5319 identified no heritage sites or features on the development footprint or immediate surrounds. The area also does not form part of any known cultural landscape. It is also highly unlikely that fossils are present within the cemetery development footprint due to the highly weathered nature of the bedrock and geological conditions present in the area. The proposed development may therefore proceed as no heritage or paleontological features are threatened by the cemetery development.

In the unlikely event that the cemetery development exposes any graves, fossils or other heritage features on the development footprint, all activities must cease, the provincial heritage resource authority, Amafa KwaZulu-Natal and/or a heritage consultant must be contacted and the chance find protocol in Appendix C must be implemented.

As per the requirements of the NHRA and the KwaZulu-Natal Heritage Act, all operations that expose graves, fossils or heritage features must cease immediately, pending an investigation by the provincial heritage resource agency.

12 REFERENCES

Coulson, C. 1986. Beaulieu on Illovo, Richmond Natal: Its People and History. Richmond Women's League. Richmond.

GCS Water and Environmental Consultants. Geohydrological Assessment for the Proposed Richmond Cemetery. November 2021.

Gondwana Geo Solutions. Report to Green Door Environmental on a Geotechnical Investigation carried out for the Proposed Richmond Cemetery (Revised Layout), Richmond, KwaZulu-Natal. October 2021.

Groenewald G. 2018. Phase 1 Palaeontological Assessment for the Proposed Mining of Farm Thandisizwe 16691, uMgungundlovu District Municipality, KZN. Internal Palaeontological Reports, SAHRA.

South African Heritage Resources Agency. 2007. Minimum Standards for the Archaeological and Heritage Components of Impact Assessments. (Unpublished guidelines).

South African Heritage Resources Agency. 2016. Updated Minimum Standards for the Archaeological and Heritage Components of Impact Assessments. (Unpublished draft guidelines).

<http://cdngiportal.co.za/cdngiportal/>

APPENDICES

APPENDIX A: SHORT CV OF THE HERITAGE CONSULTANT

CURRICULUM VITAE

Dr. Phillipa Harrison

Environmental Assessment Practitioner (EAP) and Heritage Consultant

Green Door Environmental

PhD. Geog Sci (UKZN), BA Hons Archaeology (UNISA)

CONTACT DETAILS

Telephone 033 343 4176
E-mail phillipa@greendoorgroup.co.za

Postal Address Green Door Environmental
PO Box 1170
Hilton, 3245
KZN, South Africa

Physical Address Block H Quarry Office Park,
400 Old Howick Road,
Hilton, KZN, 3245

QUALIFICATIONS

2015 – 2021 Bachelor of Arts Honours (Archaeology), University of South Africa (UNISA)

2003 – 2006 Doctor of Philosophy (PhD), University of KwaZulu-Natal, Pietermaritzburg, South Africa
Project The Role of Tourism in Natural Resource Management in the Okavango Delta, Botswana.
Supervisors Profs. B. Maharaj and T. Hill, Department of Geography, University of KwaZulu-Natal

2001 – 2002 Master of Arts (MA), University of KwaZulu-Natal, Pietermaritzburg, South Africa
Project The Impact of Tourism on Agriculture in the Okavango Delta, Botswana.
Supervisors Prof. B. Maharaj, Department of Geography, University of KwaZulu-Natal

2000 Bachelor of Arts Honours (Geography), University of KwaZulu-Natal, Pietermaritzburg
1997 – 1999 Bachelor of Arts (Geography and English), University of KwaZulu-Natal, Pietermaritzburg

PROFESSIONAL REGISTRATIONS

Association of Southern African Professional Archaeologists (ASAPA)

CAREER PROFILE WITHIN THE ENVIRONMENTAL AND HERITAGE IMPACT ASSESSMENT FIELDS

Dr Phillipa Harrison has nine years experience in the Environmental Assessment field with experience in conducting Basic Assessment and Scoping and EIA processes, compiling Environmental Management Programmes, undertaking Water Use and Waste Management License Applications, and undertaking Heritage

Impact Assessment and Desktop Palaeontological Impact Assessments. Project experience has been in the industrial, agricultural, commercial, linear and waste management sectors.

Areas of Expertise

- Heritage Impact Assessment and Desktop Palaeontological Impact Assessment Studies;
- EIA and Basic Assessment Processes (including the Public Participation Process);
- Environmental Management Programmes (EMPr);
- Water Use License Applications;
- Waste Management License Applications;
- Internal review of other EAP’s EIA work; and
- Section 24G applications and compilation of reports for unlawful activities.

CURRENT EMPLOYMENT RECORD

Green Door Environmental, Hilton, South Africa

June 2015 to Present - Environmental Assessment Practitioner and Heritage Consultant

Responsible for undertaking Heritage Assessment studies and Environmental Authorisation processes for new developments within all sectors. Compiling and implementing construction and operational EMPrs. Project Management, Permit Applications, Compilation of Reports and Environmental Reviews.

EXAMPLES OF PROJECT EXPERIENCE

PROJECT NAME	AUTHORISATION PROCESS
<ul style="list-style-type: none"> • Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment: for the proposed establishment of the Richmond Cemetery in Richmond, Richmond Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. 	Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment
<ul style="list-style-type: none"> • Cultural Heritage Resource Identification, Mapping and Assessment: for the larger Environmental Management Framework (EMF) for the Msunduzi Local Municipality, KwaZulu-Natal. 	Heritage Identification and GIS Mapping
<ul style="list-style-type: none"> • Basic Assessment Process and Environmental Auditing: for the KwaZulu-Natal Arts and Culture Trust for the establishment of the Isandlwana Affirmation Village and Garden of Remembrance tourism facility adjacent to the Isandlwana Battlefield near Nquthu, in the Umzinyathi District Municipality of KwaZulu-Natal. 	Basic Assessment Process and Environmental Auditing

APPENDIX B: SITE PHOTOGRAPHS



Plate 1: Photograph taken from the centre of the site facing westwards towards the timber plantations.



Plate 2: Photograph showing the northern portion of the site.



Plate 3: Photograph facing north eastwards towards the informal cemetery area.



Plate 4: Photograph facing westwards towards the Richmond Country Club and Recreational / Polo Fields.



Plate 5: Existing road through the development site.



Plate 6: Existing informal cemetery area located to the north east of the Richmond Cemetery development site.

APPENDIX C: CHANCE FIND PROCEDURES FOR HERITAGE / PALAEOLOGICAL RESOURCES

1. INTRODUCTION

The following procedures must be considered in the event that previously unknown heritage resources, including burial grounds or graves, are exposed or found during the life of the project. The procedures below are based on the National Heritage Resources Act, 1999 Regulations (Reg No. 6820, GNR 548).

The term 'heritage resource' here includes burial grounds and graves, structures, archaeology, palaeontology, meteors and public monuments. If any sign of the above are uncovered during excavation of the site, the following protocol must be observed:

- All work in the vicinity of the find must temporarily cease immediately and further disturbance of the heritage resource must be avoided;
- The ECO and the Richmond Local Municipality must be notified of the discovery;
- The ECO must arrange for a suitably qualified specialist to consider the heritage resource, either via communicating with the ECO via telephone or email, or based on a site visit;
- The ECO and specialist must advise on the appropriate mitigation measures to be implemented;
- Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999), the South African Heritage Resources Agency (SAHRA) must be notified and / or the Provincial Heritage Resources Authority (PHRA), Amafa KwaZulu-Natal, on behalf of the Applicant.
- The SAHRA / PHRA may require that a full Heritage Impact Assessment (HIA) in terms of NHRA Section 38 be conducted and may require rescue excavations to take place.

2. BURIAL GROUND AND GRAVE FIND PROCEDURE

In the event that human remains are accidentally exposed, the project manager and / or ECO must immediately be notified of the discovery in order to take the required further steps:

- The local SAPS will be notified on behalf of the Applicant;
- A suitably qualified specialist must be arranged to inspect the exposed burial and determine in consultation with the SAPS:
 - a) The temporal context of the remains, i.e.:
 - forensic
 - authentic burial grave (informal or older than 60 years); or
 - archaeological (older than 100 years).
 - b) Any additional graves or burial sites may exist in the vicinity.
- Should the specialist conclude that the find is a heritage resource protected in terms of the NHRA (1999), SAHRA must be notified and / or the PHRA (Amafa KwaZulu-Natal) on behalf of the Applicant.
- The SAHRA / PHRA may require that interested parties be identified and that consultation and /or grave relocation take place.
- If consultation and / or grave relocation are required, consultation and grave relocation must take place in terms of NHRA (1999).

3. FOSSIL FIND PROCEDURES

3.1 Introduction

In the context of this application, it is unlikely that any fossil finds will require the declaration of permanent "no go" areas and it is likely that if any fossil finds are made, a temporary pause in activity within a particular area will be required. In the event that fossil material is uncovered during excavation, the strategy to be employed will be to rescue the material as quickly as possible.

The procedures outlined below are in general terms and will require adaptation depending on the specifics of type of fossil find. The procedures outlined below are detailed in terms of fossil bone finds, which usually occur sparsely. However, they do serve as a guideline for other fossil material finds, which may occur on the site.

3.2 Isolated and Cluster Bone Finds

There are two types of fossil bone finds – 'isolated bone finds' and 'cluster bone finds'. During the excavation process, isolated bones may be found within the walls or base of the excavation, or as they appear on the stockpile or spoil heap. When bones appear singly, in different parts of the excavation site, they are considered 'isolated bone finds', however, when six or more isolated bones / pieces are found, the finds are considered a 'cluster bone find'. A 'cluster bone find' is when several bones are uncovered in the same spot or grouped together within the excavation site. These bones may or may not resemble an intact or partially intact skeleton.

3.2.1 Response by Personnel in the Event of an Isolated Bone Find

The following responses should be undertaken by personnel in the event of isolated bone finds:

1. An isolated bone exposed in an excavation or spoil heap must be retrieved before it is covered by further spoil from the excavation and set aside;
2. The site foreman and ECO must be informed;
3. The responsible field person (site foreman or ECO) must take custody of the fossil. The following information is to be recorded:
 - Position (excavation position);
 - Depth of find in hole;
 - Digital image of hole showing vertical section (side); and
 - Digital image of fossil.
4. The fossil should be placed in a bag (e.g. a Ziploc bag), along with any detached fragments. A label must be included with the date of the find, position information, and depth; and
5. The ECO is to inform the Applicant who must then contact the archaeologist and / or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

3.2.2 Response by Palaeontologist in the Event of Isolated Bone Finds

The palaeontologist will assess the information and liaise with the Applicant and the ECO and a suitable response procedure will be established.

3.3 Response by Personnel in the Event of a Cluster Bone Find

The following responses should be undertaken by personnel in the event of bone cluster finds:

1. Immediately stop excavation in the vicinity of the potential material. Mark or flag the position as well as the spoil heap that may contain fossils;
2. Inform the site foreman and the ECO; and
3. The ECO is to inform the developer who must then contact the archaeologist and / or palaeontologist contracted to be on standby. The ECO must then describe the occurrence and provide images via email.

3.3.2 Response by Palaeontologist in the Event of a Bone Cluster Find

A palaeontologist must assess the information and liaise with the Applicant and the ECO and a suitable response procedure must be established. It is likely that a Field Assessment by the palaeontologist will be required. The response time / scheduling of the Field Assessment will be decided in consultation with the Applicant and the ECO. The Field Assessment could have the following outcomes:

- If a human burial, the appropriate authority is to be contacted. The find must be evaluated by a human burial specialist to decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are of an archaeological context, an archaeologist must be contacted to evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.
- If the fossils are of a palaeontological context, the palaeontologist must evaluate the site and decide if Rescue Excavation is feasible, or if it is a Major Find.

3.4 Rescue Excavation

Rescue Excavation refers to the removal of the material from the site excavation. This is applicable if the volume or significance of the exposed material appears to be relatively confined and it is feasible to remove it without compromising the contextual data. The time span for Rescue Excavation should be relatively rapid to avoid any undue delays (e.g. less than one week).

In principle, the strategy during the mitigation is to “rescue” the fossil material as quickly as possible. The strategy to be adopted depends on the nature of the occurrence, particularly the density of the fossils. The methods of collection would depend on the preservation or fragility of the fossil and whether in loose or in lithified sediment.

These could include:

- On-site selection and sieving in the case of robust material in sand; and
- Fragile material in loose sediment would be encased in blocks using Plaster-of-Paris or reinforced mortar.

If the fossil occurrence is dense and is assessed to be a “Major Find”, a carefully controlled excavation is required.

3.5 Major Finds

A Major Find is when the occurrence of material that, by virtue of quantity, importance and time constraints, cannot be feasibly rescued without compromising the detailed material recovery and contextual data / observations.

3.5.1 Management Options for Major Finds

In consultation with the Applicant and the ECO, the following options should be considered when deciding on how to proceed in the event of a Major Find.

Option 1: Avoidance

Avoidance of the Major Find through project redesign or relocation. This ensures minimal impact to the site and is the preferred option from a heritage resource management perspective. When feasible, it can also be the least expensive option from a construction perspective. The find site will require site protection measures, such as erecting fencing or barricades. Alternatively, if excavation of the find will be delayed substantially or indefinitely, the exposed finds can be stabilised and the site refilled or capped. Appropriate protection measures should be identified on a site-specific basis and in wider consultation with the heritage and scientific communities. This option is preferred as it will allow the later excavation of the finds with due scientific care and diligence.

Option 2: Emergency Excavation

Emergency excavation refers to the “no other option” situation where avoidance is not feasible due to design, financial and time constraints. It can delay construction and emergency excavation itself will take place under tight time constraints, with the potential for irrevocable compromise of scientific quality. It could involve the removal of a large, disturbed sample by an excavator and conveying this by truck from the immediate site to a suitable place for “stockpiling”. This material could then be processed later. Emergency excavation is not the preferred option for a Major Find due to the loss of contextual data and the loss of sample integrity.

3.6 Exposure of Other Fossil Types (e.g. Plants, Fossil Shell Beds)**3.6.1 Response for Personnel in the Event of Other Fossil Finds**

The following responses should be undertaken by personnel in the event of any type of fossil finds:

1. The site foreman and ECO must be informed;
2. The responsible field person (site foreman or ECO) must record the following information:
 - Position (excavation position);
 - Depth of find in hole;
 - Digital image of the hole showing the vertical section (side); and
 - Digital images of the fossiliferous material.
3. A generous quantity of the excavated material containing the fossils should be stockpiled near the site, for later examination and sampling;
4. The ECO is to inform the developer who must then contact the archaeologist and/or palaeontologist contracted to be on standby. The ECO is to describe the occurrence and provide images via email.

3.6.2 Response by the Palaeontologist in the Event of Other Fossil Finds

The palaeontologist will assess the information and liaise with the developer and the ECO and a suitable response will be established. This will most likely be a site visit to document and sample the exposure in detail, before it is covered up.

4. MONITORING FOR FOSSILS

A regular monitoring presence over the period during which excavations are made, by either an archaeologist or palaeontologist, is generally not practical.

The field supervisor or foreman and workers involved in digging excavations must be encouraged and informed of the need to watch for potential fossil and buried archaeological material. Workers seeing potential objects are to report to the field supervisor who, in turn, will report to the ECO. The ECO will inform the archaeologist and / or palaeontologist contracted to be on standby in the case of fossil finds.

To this end, responsible persons must be designated. This will include hierarchically:

- The field supervisor or foreman who is going to be most often in the field;
- The ECO for the project; and
- The Project Manager.

Should the monitoring of excavations be stipulated in the Archaeological Impact Assessment and / or the Heritage Impact Assessment, the contracted Monitoring Archaeologist (MA) can also monitor for the presence of fossils and make field assessment of any material brought to attention. The MA is usually sufficiently informed to identify fossil material and this avoids additional monitoring by a palaeontologist.

The MA then becomes the responsible field person and fulfils the role of liaison with the palaeontologist and coordinates with the Applicant and the ECO. If fossils are exposed in non-archaeological contexts, the palaeontologist should be summoned to document and sample / collect them.