



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

**PROPOSED ESTABLISHMENT OF THE UMLAAS JUNCTION  
PRIVATE LIGHT INDUSTRIAL ESTATE LOCATED ON REM OF THE  
FARM CROOKES No. 15732, CAMPERDOWN, MKHAMBATHINI  
LOCAL MUNICIPALITY AND UMGUNGUNDLOVU DISTRICT  
MUNICIPALITY, KZN.**

**PREPARED FOR: UMLAAS JUNCTION (PTY) LTD**

**DATE: 01 MARCH 2022**

**FINAL REPORT**

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<b>Date:</b>	01 March 2022
<b>Document Title:</b>	Phase 1 Heritage Impact Assessment & Desktop Palaeontological Impact Assessment for the proposed establishment of the Umlaas Junction Private Light Industrial Estate, Camperdown, KwaZulu-Natal.
<b>Author:</b>	Dr Phillipa Harrison – Green Door Environmental
<b>Peer Review:</b>	Jean Beater – JLB Consulting
<b>Report Prepared For:</b>	Umlaas Junction (Pty) Ltd

**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.



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

Refer to Appendix A for the CV of the Heritage Consultant

**External Peer Review:**



**Jean Beater - MA Heritage Studies; MSc Environmental Management**  
**Tel: 0844041118**  
**Email: jean.beater@gmail.com**

## EXECUTIVE SUMMARY

Green Door Environmental was appointed on behalf of Umlaas Junction (Pty) Ltd to conduct a Phase 1 Heritage Impact Assessment (HIA) and Desktop Palaeontological Impact Assessment (PIA) for the proposed establishment of a light industrial estate on a portion of the property Rem of the Farm Crookes No. 15723 in the Camperdown Area, Mkhambathini Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. The proposed development will form part of the Umlaas Road Logistics and Light Industrial Node and will comprise medium to large light industrial facilities and mini-factories. A proposed wastewater treatment works (WWTW) will also be established as part of the development, to be located approximately 170m to the south west of the development footprint.

The proposed development site is approximately 140ha in extent and is currently unzoned-used for agriculture and comprises sugar cane cultivation. Whilst the site is currently unzoned, the proposed 140ha development portion has been released from agriculture and adopted into the 2019 Mkhambathini Municipality Spatial Development Framework (SDF) for 'Light Industrial' development within a five year period. As such, a Phase 1 HIA is being undertaken in accordance with the requirements of Section 41(1)(c)&(d) of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act 5 of 2018). The proposed development 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 light industrial estate development project.

The Phase 1 HIA and Desktop PIA also form part of the Environmental Authorisation process under the National Environmental Management Act (NEMA) 1998 (Act 107 of 1998) for the proposed establishment of the Umlaas Junction Private Light Industrial Estate. The proposed development triggers Listed Activities in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (amended 2017) under NEMA for which a Basic Assessment Process is required.

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 22<sup>nd</sup> February 2022 following standard archaeological survey procedures.

The proposed development site is located approximately 3km to the west of Camperdown. It is bounded to the north by the P338 Road and the Gromor fertilizer supplier complex, and to the east by the Onelogix Umlaas Road logistics and supply chain depot. The site is surrounded by existing sugar cane cultivation to the south and west. An existing Transnet Limited railway line servitude, which was registered in 1952, traverses the central portion of the site, and a servitude for a New Multi-Product Pipeline (NMPP), which transports liquid petroleum fuel from Durban to Gauteng, traverses the eastern portion of the site. Both of these servitudes are respected in the proposed development footprint.

A portion of the historic South African Railways (SAR) Umlaas Road to Mid-Illovo Natal Narrow Gauge Railway Line previously traversed the eastern portion of the development site. The two-foot gauge railway line was opened in 1911, starting from the main line at Umlaas Road and terminating at Mid-Illovo, approximately 42km away (Martin *et al*, 2021). The railway line was operational for 74 years, with the last scheduled train running on the 28<sup>th</sup> February 1985 (Martin *et al*, 2021). By 1987, all of the narrow gauge rails on the Umlaas Road to Mid-Illovo Branch had been removed. All associated narrow gauge structures for the line such as water tank, coal stage, loading ramp and locomotive shed were also subsequently demolished (Martin *et al*, 2021). The only evidence of the Umlaas Road to Mid-Illovo Narrow Gauge line left today is the remains of the trackbed in some places (Martin *et al*, 2021). The portion of the historic railway line route that previously traversed the development site is now under sugar cane cultivation.

The majority of the site is underlain by Early Permian age shale of the Pietermaritzburg Formation of the Ecca Group, with the central portion of the site underlain by Late Carboniferous to Early Permian age tillite or diamictite sedimentary rock of the Dwyka Formation of the Karoo Supergroup (Gondwana, February 2022). There is a localised intrusion of Jurassic age dolerite along the northern boundary of the site (Gondwana, February 2022). Dolerite is an intrusive igneous rock which has an insignificant/zero sensitivity rating according to the SAHRIS palaeo-sensitivity map, and comprises a non-fossiliferous rock type.

The likelihood of significant fossils being present in the Dwyka Group deposits is low as the cold glacial environment in which the sedimentary rocks of the Dwyka Group were deposited is not considered conducive to fossilisation. In addition, while trace and fragmentary *Glossopteris* plant fossils have been found in mudstones at some Dwyka sites, none have been recorded in KwaZulu-Natal (Bamford, 2020). The shale rock which is present on the site comprises shallow to deeper water Pietermaritzburg Formation sediments. The only fossil finds associated with the Pietermaritzburg Formation shale sediments in this part of KwaZulu-Natal comprise invertebrate trace fossils (Bamford, 2020). Furthermore, the site occurs on a contact zone between the Dwyka Group and Pietermaritzburg Formation and intrusive volcanic lavas. The extreme heat and pressure from the lava intrusion would likely have destroyed any potential fossils that may have been present within the vicinity of the contact zone (Trower, 2021). As such, no well preserved fossils are expected to be present on the study site. However, in the unlikely event that the development excavations expose fossil material, the chance find protocol in Appendix C must be implemented.

No heritage resources were identified on the proposed development site during the Phase 1 HIA and Desktop PIA. A portion of the historic Umlaas Road to Mid-Illovo Narrow Gauge Railway Line previously traversed the eastern portion of the study site. However, this railway line was completely removed between 1985 and 1987. As the study site is underlain by sedimentary rock of the Dwyka and Pietermaritzburg Formations, and a dolerite intrusion is present in the northern most portion of the site, no well preserved fossils are expected to be present on the study site. As such, the proposed Umlaas junction Private Light Industrial Estate development may proceed on the identified site subject to the recommendations as contained in Section 11 of this Report.

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

## LIST OF ABBREVIATIONS

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
NMPP	New Multi-Product Pipeline
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SAR	South African Railways
SDF	Spatial Development Framework
WWTW	Wastewater Treatment Works

# UMLAAS JUNCTION PRIVATE LIGHT INDUSTRIAL ESTATE: PHASE 1 HERITAGE IMPACT ASSESSMENT AND DESKTOP PALAEOLOGICAL IMPACT ASSESSMENT

## 1 INTRODUCTION AND DEVELOPMENT BACKGROUND

Green Door Environmental was appointed on behalf of Umlaas Junction (Pty) Ltd to conduct a Phase 1 Heritage Impact Assessment (HIA) and Desktop Palaeontological Impact Assessment (PIA) for the proposed establishment of a light industrial estate on a 140ha portion of the property Rem of the Farm Crookes No. 15723 in the Camperdown Area, Mkhambathini Local and uMgungundlovu District Municipality, KwaZulu-Natal. The proposed development site is accessed off the P338 Road and is situated alongside the N3 Highway Corridor and Umlaas Road Interchange, at GPS coordinates S29°43'18.10" and E30°29'14.72", approximately 3km to the west of Camperdown.

The proposed development will form part of the Umlaas Road Logistics and Light Industrial Node and will comprise medium to large light industrial facilities and mini-factories, supported by several smaller mixed-use opportunity zones. A proposed wastewater treatment works (WWTW) will also be established as part of the development, to be located approximately 170m to the south west of the development footprint. Access to the site will be off the P338 Road and the development will have an internal road network. The proposed development site is currently unzoned-used for agriculture and comprises sugar cane cultivation. Whilst the site is currently unzoned, the proposed 140ha development portion has been released from agriculture and adopted into the 2019 Mkhambathini Municipality Spatial Development Framework (SDF) for 'Light Industrial' development within a five year period.

This Phase 1 HIA is being undertaken in accordance with the requirements of Section 41(1)(c)&(d) of the KwaZulu-Natal Amafa and Research Institute Act, 2018 (Act 5 of 2018). The proposed development 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 light industrial estate development project. The Phase 1 HIA and Desktop PIA also form part of the Environmental Authorisation process under the National Environmental Management Act (NEMA) 1998 (Act 107 of 1998) for the proposed establishment of the Umlaas Junction Private Light Industrial Estate. The proposed development triggers Listed Activities in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (amended 2017) under NEMA for which a Basic Assessment Process is required.

## 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 National Heritage Resources Act (NHRA), 1999 (Act 25 of 1999) and the KwaZulu-Natal Amafa and Research Institute Act.

As per the requirements set out in Section 41(3) of the KwaZulu-Natal Amafa and Research Institute Act, 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 sugar cane cultivation which covers almost 100% of the study site.
- 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 late summer when vegetation cover is denser. 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, and Section 38 of the NHRA sets out the requirements for heritage resources management.

#### **4.3 KWAZULU-NATAL AMAFA AND RESEARCH INSTITUTE ACT 2018 (ACT 5 OF 2018)**

The KwaZulu-Natal Amafa and Research Institute Act provides for the recognition of the establishment of the KwaZulu-Natal Amafa and Research Institute as the provincial heritage resources authority for the Province of KwaZulu-Natal, to identify, conserve, protect, manage and administer heritage resources in the Province of KwaZulu-Natal.

Chapter 7 of the Act provides for the establishment of the Amafa and Research Forum, whose objectives include the compilation of a consolidated register of all heritage resources in the Province of KwaZulu-Natal. 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, informal and private burial grounds, battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite and meteorite impact sites. Section 41(1 – 10) of Chapter 8 of the Act sets out the requirements for heritage resources management specifically in terms of the undertaking of developments, and the need and requirements for impact assessment studies and report requirements.

Chapter 9 of the Act provides for the special protection of heritage resources including the designation of protected area, heritage landmark and provincial landmark status, and special protection of graves of members of the Royal Family, battlefields, public monuments and memorials, and heritage objects. Chapter 9 of the Act also makes provision for the establishment of a consolidated register of heritage sites and heritage objects in the Province of KwaZulu-Natal. Chapter 10 of the Act provides for the determination of criteria for best practice, standards, norms and conditions for the management of heritage resources in the Province of KwaZulu-Natal. Lastly, Chapter 11 outlines the general

provisions of the Act and includes allowances for the drafting of Regulations to enable the provincial heritage resources authority to regulate heritage matters in the Province of KwaZulu-Natal.

#### 4.4 MINIMUM STANDARDS FOR HERITAGE SPECIALIST STUDIES

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.

#### 4.5 KWAZULU-NATAL AMAFA AND RESEARCH INSTITUTE REGULATIONS, 2021 (DRAFT REGULATIONS)

The draft KwaZulu-Natal Amafa and Research Institute Regulations, 2021 in terms of Section 58 of the KwaZulu-Natal Amafa and Research Institute Act, provides for the regulation of heritage matters in the KwaZulu-Natal Province. The Regulations specifically outline the requirements for permit applications and the application procedures to be followed. Section 7 of the Regulations outlines the requirements in terms of the discovery of archaeological or palaeontological material or a meteorite. Section 12 of the Regulations outlines the heritage resources management requirements in terms of undertaking developments, and procedures to be followed to ensure compliance with the requirements of the KwaZulu-Natal Amafa and Research Institute Act and NHRA.

Table 1 below outlines the confirmed legislative requirements applicable to the proposed Umlaas Junction Light Industrial Estate 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 28	<i>“Residential, mixed, retail, commercial, industrial or institutional development where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 1 April 1998 and where such development... (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.”</i>
KwaZulu-Natal Amafa and Research Institute Act 2018 (Act 5 of 2018)	Section 41(1)	<i>“Any person who intends to undertake a development categorized 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 m<sup>2</sup> 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; (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or (e) any other category of development provided for in regulations, must, at the very earliest stages of initiating such a development, notify the Institute and furnish it with details regarding the location, nature and extent of the proposed development.”</i>

## 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/>) in order to identify historical land uses associated with the study site and surrounds. The SAHRIS website and Provincial Heritage Register were consulted for data on the presence and significance of any heritage sites within the Mkhambathini Local Municipal area and in particular the Camperdown 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, February 2022) 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 22<sup>nd</sup> February 2022 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. As most of the development site is currently under sugar cane cultivation, ground visibility was compromised in most areas of the site, with the exception of the areas where the sugar cane has recently been cut, and along the northern site boundary, access and internal roads, and cane stockpiling and loading area in the northern 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 the property owner (farmer) telephonically prior to the site visit in order to gain an understanding of the site history and determine the possibility of the presence of any graves, stone walling or other heritage features on the study site. The farmer was not aware of the presence of any graves, stone walling or other heritage features on the development footprint.

The relevant site photographs are included in Appendix B.

## 6 PROJECT DESCRIPTION AND LOCALITY

The proposed Umlaas Junction Light Industrial Estate development site is located on Rem of the Farm Crookes No. 15723, which is situated approximately 3km to the west of Camperdown in the Mkhambathini Local and uMgungundlovu District Municipality of KwaZulu-Natal. The entire property is 252.72ha in extent however only approximately 140ha will be developed as part of this project. The development site is currently under sugar cane cultivation and can be considered 100% transformed.

The site comprises gently undulating, rolling topography which is typical of the Natal Midlands setting. An existing Transnet Limited railway line servitude, which was registered in 1952, traverses the central portion of the site and results in the division of the site into two separate portions. The railway line is no longer in use and has been removed, with the track in-filled in some places. There is also a servitude for a New Multi-Product Pipeline (NMPP) traversing the eastern portion of the site, which is used to transport liquid petroleum fuel from Durban to Gauteng. Both of these servitudes have been respected in the proposed development footprint.

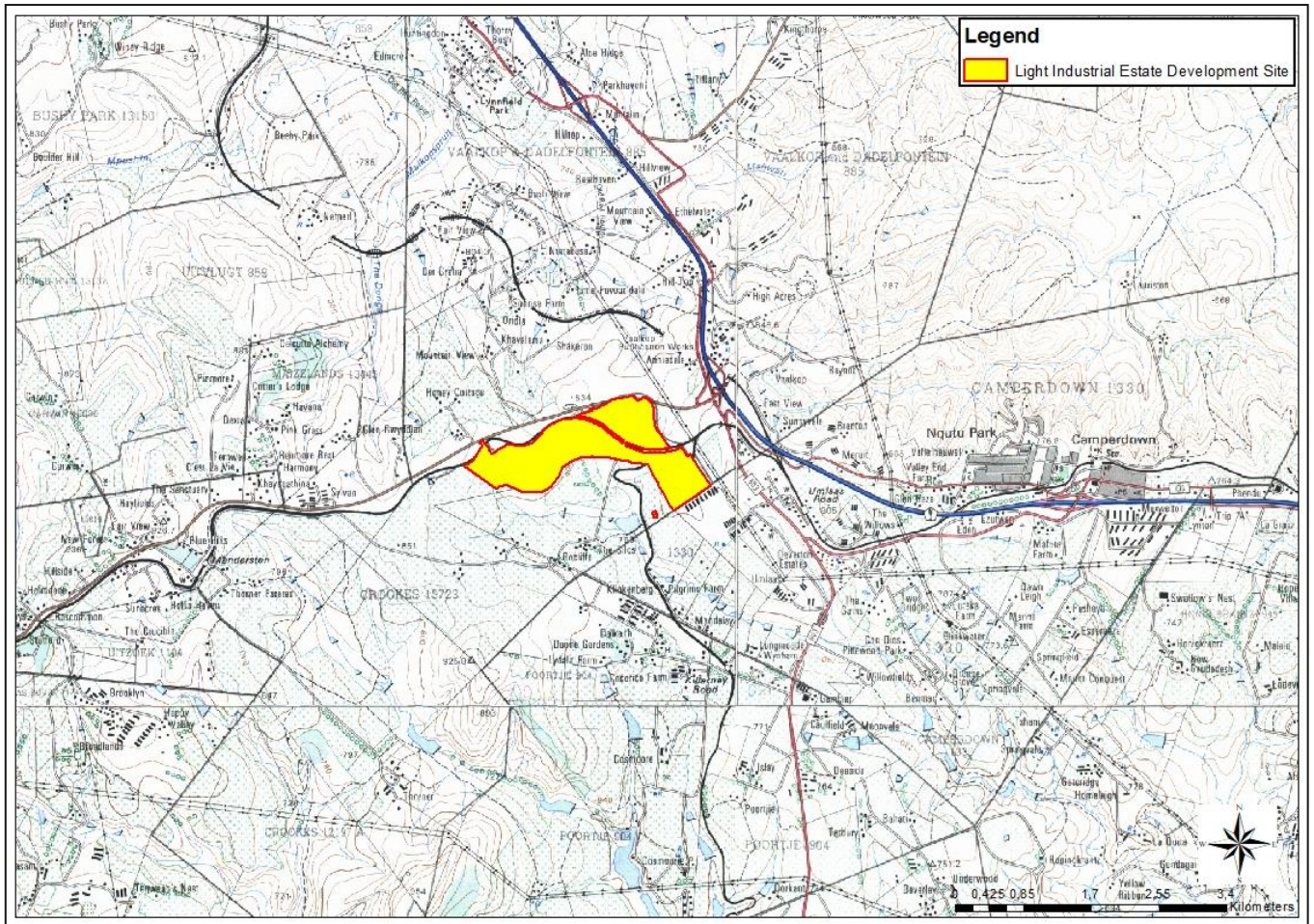
The development site is bounded to the north by the P338 Road and the Gromor fertilizer supplier complex, and to the east by the Onelogix Umlaas Road logistics and supply chain depot. The N3 Highway, Umlaas Road Interchange and the R603 and R103 Roads are also located to the east of the development site. The site is surrounded by existing sugar cane cultivation to the south and west and there is an agricultural dam located approximately 500m to the south of the development footprint boundary.

A portion of the historic South African Railways (SAR) Umlaas Road to Mid-Illovo Natal Narrow Gauge Railway Line previously traversed the eastern portion of the development site. The two-foot gauge railway line was opened in 1911, starting from the main line at Umlaas Road and terminating at Mid-Illovo, approximately 42km away (Martin *et al*, 2021). The railway line was operational for 74 years, with the last scheduled train running on the 28<sup>th</sup> February 1985 (Martin *et al*, 2021). By 1987, all of the narrow gauge rails on the Umlaas Road to Mid-Illovo Branch had been removed. All associated narrow gauge structures for the line such as water tank, coal stage, loading ramp and locomotive shed were also subsequently demolished and the Mid-Illovo station building was dismantled and moved to the Pineville Junction Historic Village in Pinetown (Martin *et al*, 2021). The only evidence of the Umlaas Road to Mid-Illovo Narrow Gauge line left today is the remains of the trackbed in some places and old iron bridge structures over the Mlazi and Mgwahumbe Rivers (Martin *et al*, 2021). The portion of the historic railway line route that previously traversed the development site is now under sugar cane cultivation.

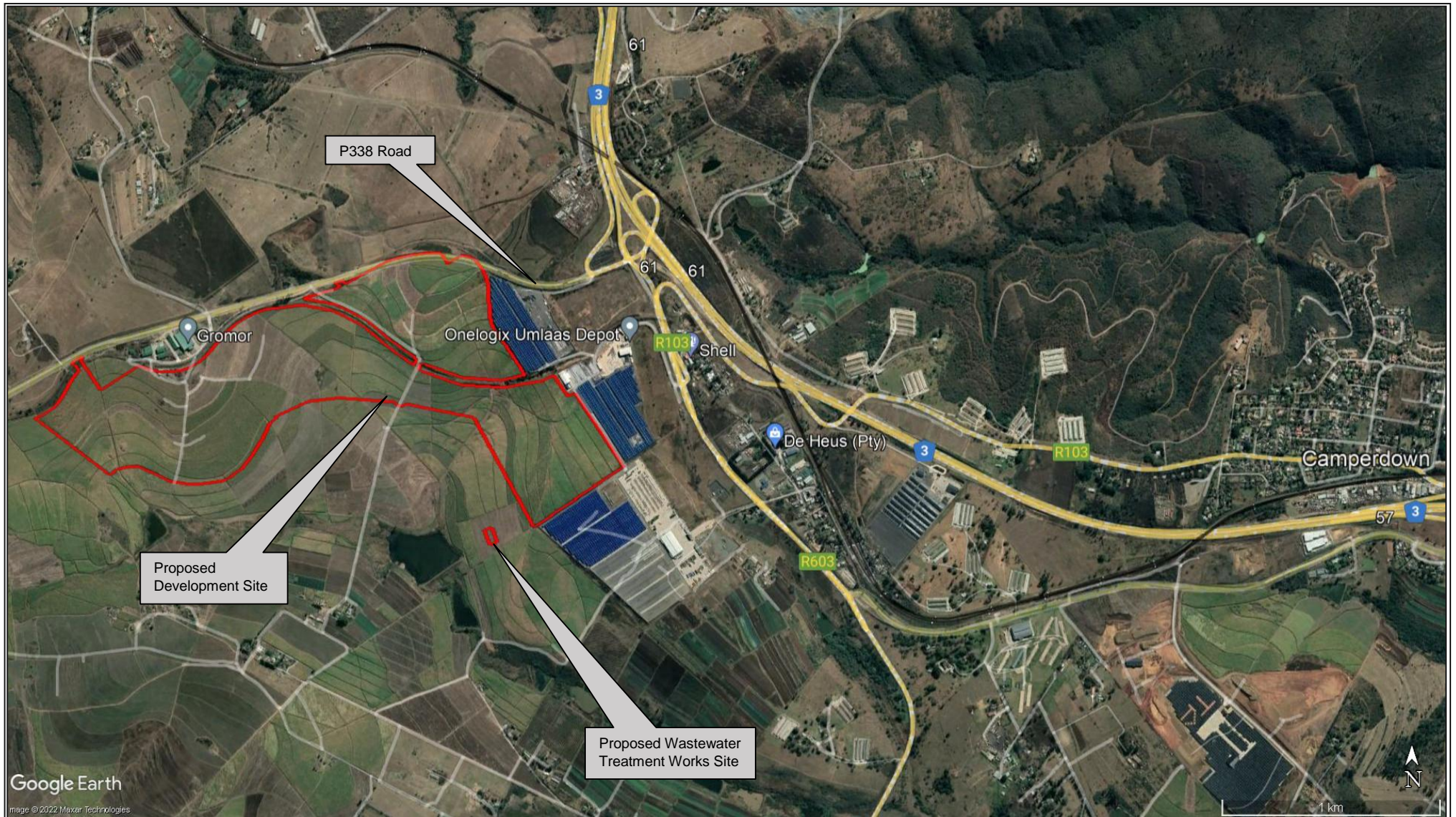
Table 2 below provides the details of the general project area and the specifics of the development, while Figures 1 - 3 below provide locality maps.

**Table 2: Details of the General Project Area and Development Specifics**

Property description	Rem of the Farm Crookes No. 15723
Magisterial District	Mkhambathini Local Municipality and uMgungundlovu District Municipality
1: 50 000 map sheet number	2930CB
Central co-ordinate of the development	S29°43'26.87" and E30°28'55.75"
Type of development	Light Industrial Estate
Property zoning	Site is currently unzoned-used for agriculture. To be rezoned to Light Industrial.



**Figure 1: 1: 50 000 topographical map of the proposed Umlaas Junction Private Light Industrial Estate development site in the Camperdown area.**



**Figure 2: Locality map of the study site and surrounding area.**

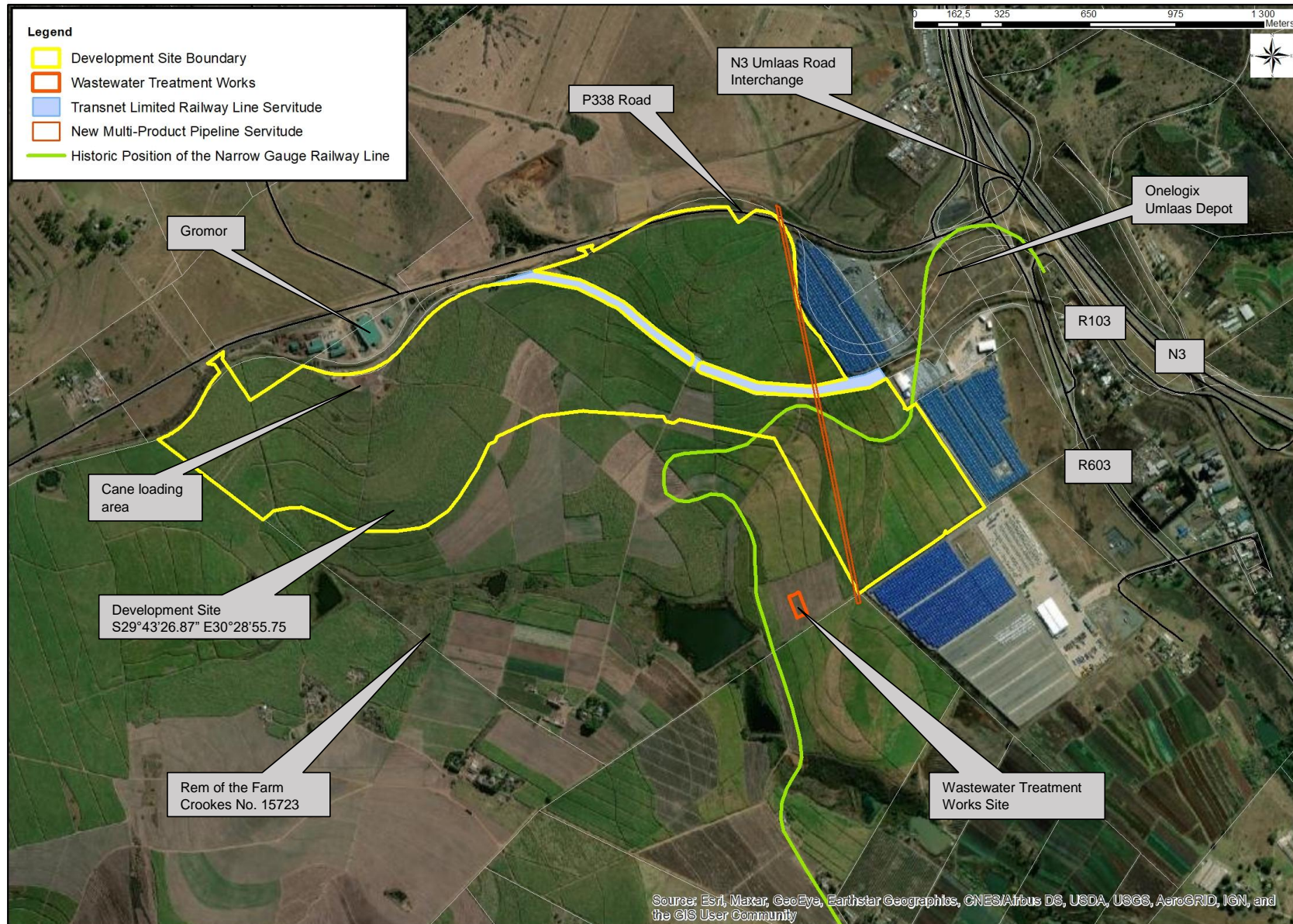


Figure 3: Umlaas Junction Private Light Industrial Estate development site.



## 7 CULTURAL OVERVIEW OF THE STUDY AREA

Camperdown is situated approximately 23km south east of Pietermaritzburg and 55km north west of Durban in the Valley of a Thousand Hills. The town was laid out in 1865 on the farm Camperdown, which was named to commemorate a British naval victory over the Dutch in October 1797. The Camperdown area developed over the years into an important maize and wattle farming area.

The KwaZulu-Natal Museum Database indicates a number of archaeological sites in the larger Camperdown and Cato Ridge area. Most of these comprise isolated stone-age artefacts, such as stone flakes and tools, located near watercourse such as the Umgeni and Msunduze Rivers, in open air contexts. There is one Early Stone Age site recorded near to the development footprint. This site is located approximately 1.2km to the north east of the development property, in close proximity to the N3 Highway, as shown in Figure 4 below. This site is not threatened in any way by the proposed Umlaas Junction Light Industrial Estate development.



**Figure 4: Location of identified Early Stone Age site within the vicinity of the development footprint.**

There are also a number of Iron Age sites in the greater study area, which are generally characterised by the presence of pottery remains, remains of stone structures such as stone walling, and other metal artefacts. Most of the Iron Age sites are located in the Umgeni Valley area, away from the project site (Prins, 2016). None of the identified Stone Age or Iron Age sites occur on the light industrial estate development footprint.

A number of colonial-era buildings and farmsteads associated with the Victorian and Edwardian periods are also present within the greater Camperdown and Cato Ridge area. All of these sites are over 60 years old and are protected by heritage legislation, however none are located on the development footprint.

As mentioned in previous sections of this report, a portion of the historic Umlaas Road to Mid-Illovo Natal Narrow Gauge Railway Line previously traversed the eastern portion of the development site. The railway line and all associated structures were however removed from the study site between 1985 and 1987. The portion of the historic railway line route that previously traversed the development site is now under sugar cane cultivation.

The closest provincial heritage site as listed in the Provincial Heritage Register is located approximately 18km to the east of the development site, and comprises the Monteseel Cycad Monument in Monteseel Township (Register ref: 9/2/403/0001).

## **8 GEOLOGY AND PALAEOLOGY**

South Africa has a very rich fossil record, dating back over some 3.5 billion years. Fossil heritage is found in all provinces of South Africa. The palaeontological sensitivity of the study site as per the SAHRIS palaeo-sensitivity map is shown in Figure 5 below. The SAHRIS paleo-sensitivity map shows most of the area as “moderately sensitive” in terms of fossil sensitivity, with the exception of the northern boundary of the site, which comprises a localised dolerite intrusion with an insignificant/zero fossil sensitivity rating. Dolerite is an intrusive igneous rock and comprises a non-fossiliferous rock type.

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 6 below. The majority of the site is underlain by Early Permian age shale of the Pietermaritzburg Formation of the Eccca Group, with the central portion of the site underlain by Late Carboniferous to Early Permian age tillite or diamictite sedimentary rock of the Dwyka Formation of the Karoo Supergroup (Gondwana, February 2022). There is a localised intrusion of Jurassic age dolerite along the northern boundary of the site (Gondwana, February 2022).

The geology of the study site was confirmed during the specialist Geotechnical Investigation undertaken by Gondwana Geo Solutions (February 2022) as part of the Basic Assessment Process for the development. The northern most portion of the site that bounds the P338 Road comprises a horizontal profile of 1.5 – 2.0m of weathered dolerite soils with dolerite core stone boulders throughout (Gondwana, February 2022). The weathered dolerite is expected to gradually grade into very soft to soft rock dolerite with depth (Gondwana, February 2022). Shale rock is anticipated to occur along the northern half of the site, extending towards the western portion (Gondwana, February 2022). The shale comprises yellowish brown, completely to highly weathered very soft rock to soft rock shale (Gondwana, February 2022). The shale forms a capping horizon over the underlying tillite and varved shale (passage beds) of the Dwyka Formation sediments in the north western and south eastern portions of the site (Gondwana, February 2022).

The study site lies in the eastern part of the main Karoo Basin. The eastern extent of the Karoo Basin has the lower formations of the Karoo Supergroup exposed, which include the basal Dwyka Group and the Pietermaritzburg and Volksrust Formations of the Eccca Group (Bamford, 2020). Intruding into these sediments are Jurassic age dolerite dykes associated with the eruption of the Drakensberg Basalts (Bamford, 2020).

The geological formations of the Dwyka Group are largely restricted to the edges of the Karoo Basin and comprise glacial deposits (tillite) from retreating ice sheets about 300 million years ago during the Late Carboniferous to Early Permian period. The Dwyka Group is the earliest and lowermost deposit in the Karoo Supergroup Basin. Approximately 300 to 290 million years ago, southern Africa was part of the supercontinent Gondwana and was located in the Antarctic region with much of the land surface covered by ice sheets. As Gondwana drifted northwards and the ice sheets melted they dropped moraine trapped in the ice, together with some plant matter from the vegetation that was gradually colonising the land surface, forming a thick unit of tillite (Bamford, 2020). Deposited flora from this period (Late Carboniferous) comprises *Glossopteris* leaves, wood, as well as other plants such as lycopods, sphenophytes and ferns (Bamford, 2020). Terrestrial vertebrates had not yet evolved during this period (Bamford, 2020).

The Dwyka Group is made up of a number of differing lithological facies which were deposited in the marine environment of the Karoo Basin as a result of the differing environmental processes associated with glacial formation and retreat. These facies are further subdivided into two main geological formations, namely the Elandsvlei Formation in the southern deposits and the Mbizane Formation in the northern deposits. Of the various facies that make up the Dwyka Group, fossil plant fragments and trace fossils have only been recorded from the mudrock facies in the Douglas area of the Northern Cape, and in the Free State (Bamford, 2020). No fossils associated with the Dwyka Group have been recorded from KwaZulu-Natal (Bamford, 2020).

The Pietermaritzburg Formation was deposited during the post-glacial rise in sea levels during the Early Permian period from approximately 290 million years ago, when a drainage network of meltwaters from the receding glaciers and ice sheets deposited fine to medium-grained sediments into the Karoo Basin (Bamford, 2020; Trower, 2021). Invertebrate trace fossils have been recorded from the Pietermaritzburg Formation in the eastern extent of the Karoo Basin. These are limited to traces of bioturbation (disturbance of sediments) from invertebrate burrows (Bamford, 2020). Rarer plant fragments have also been discovered, however only in borehole material (Bamford, 2020). No plant fossil surface collections have been found to date for this area (Bamford, 2020). Lastly, Jurassic age dolerite comprises a non-fossiliferous rock type which, by its nature as an intrusive volcanic rock, has the potential to damage or destroy fossils preserved in adjacent fossiliferous deposits (Trower, 2021).



Figure 5: SAHRIS palaeo-sensitivity map for the study site (SAHRIS).

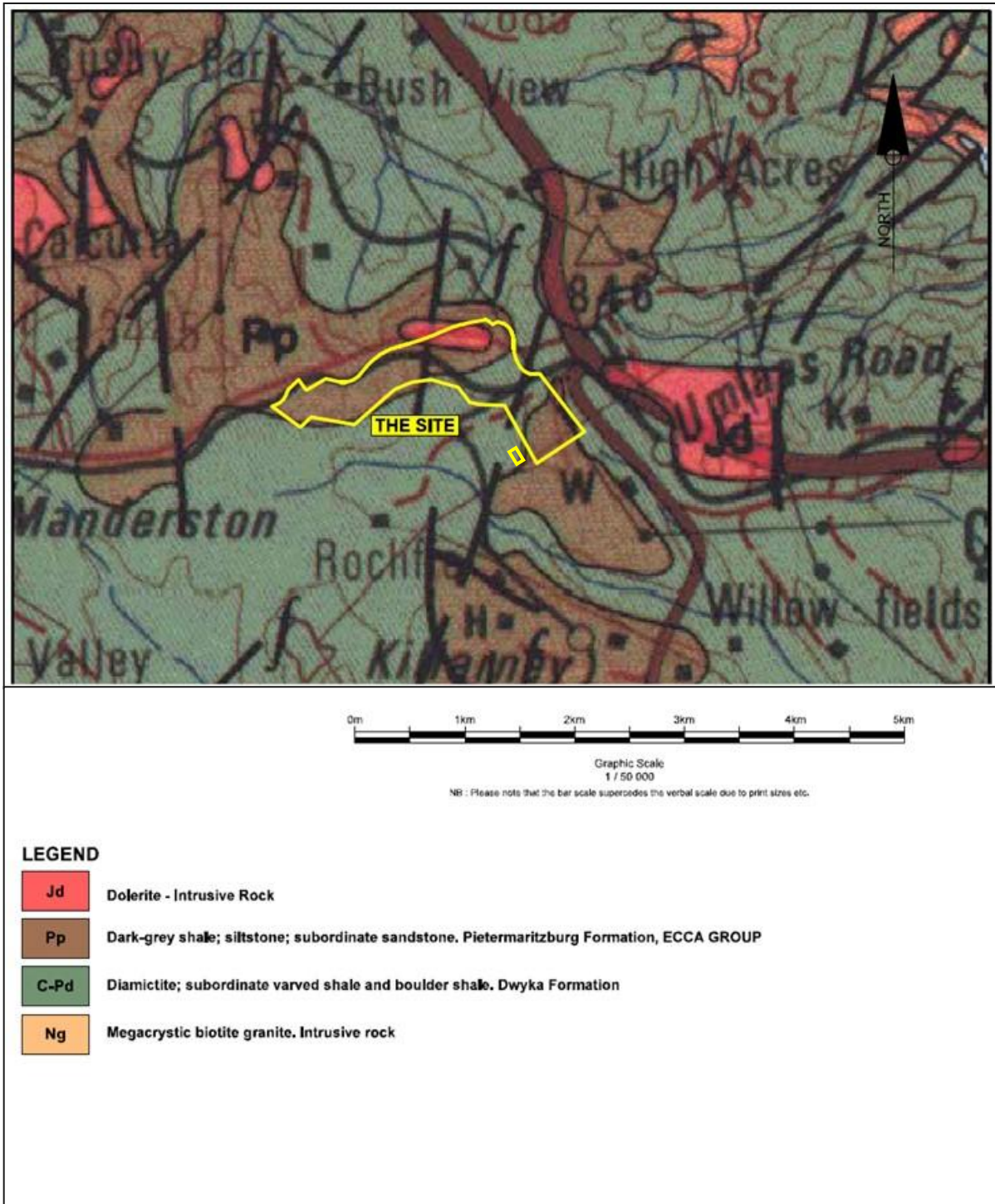


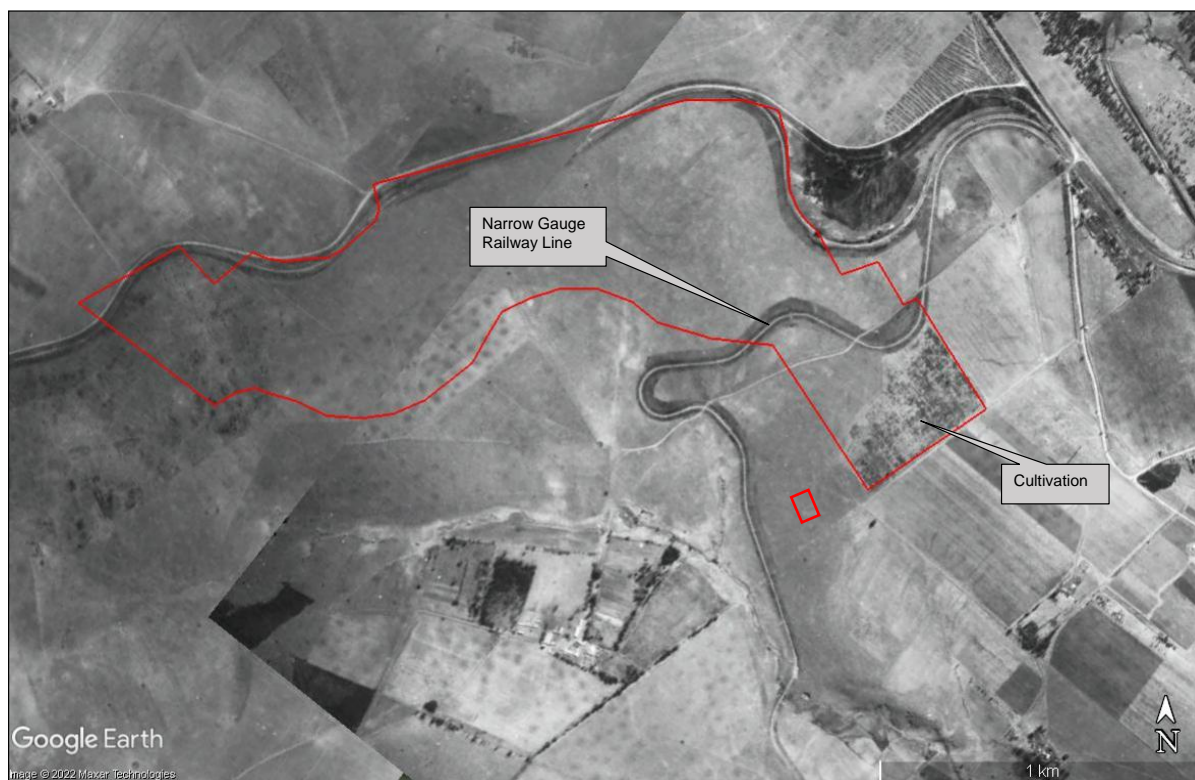
Figure 6: Regional geology of the study area (Council for Geosciences).

## 9 ASSESSMENT RESULTS

### 9.1 DESKTOP STUDY

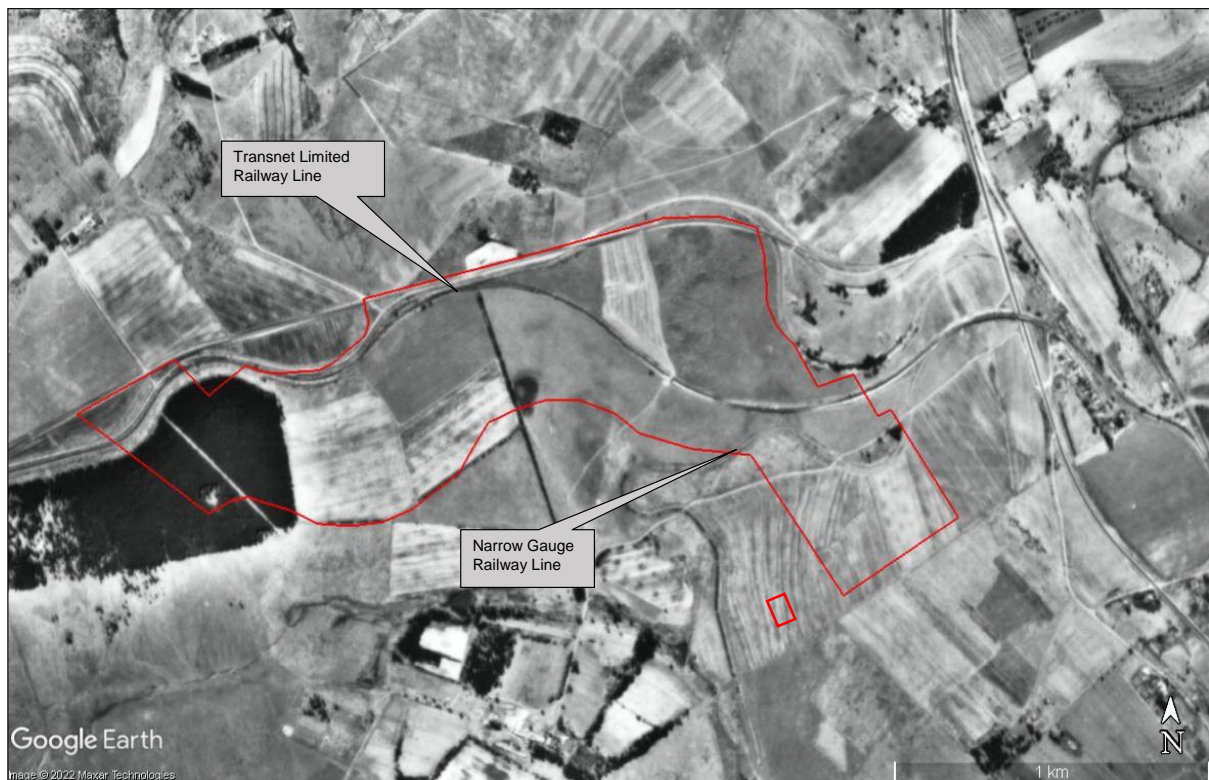
An investigation into historical aerial imagery of the development site was undertaken as part of the Phase 1 HIA. Aerial imagery from 1937 up to 2006 (Figures 7 – 11) was used to identify past activity on the study site. The aerial imagery shows that the development site has a long history of agricultural use and associated anthropogenic disturbance and can be considered 100% transformed.

Aerial imagery from 1937 shows most of the site as unmodified, comprising grassland (Figure 7). An approximate 11ha area in the south eastern corner of the site has been cultivated. The Umlaas Road to Mid-Illovo Narrow Gauge Railway Line which was established in 1911 is also clearly visible in the south-eastern portion of the study site.



**Figure 7: Historic aerial imagery of the development site from 1937 shows the site as largely unmodified, comprising grassland. The Umlaas Road to Mid-Illovo Narrow Gauge Railway Line is visible across the south eastern portion of the site.**

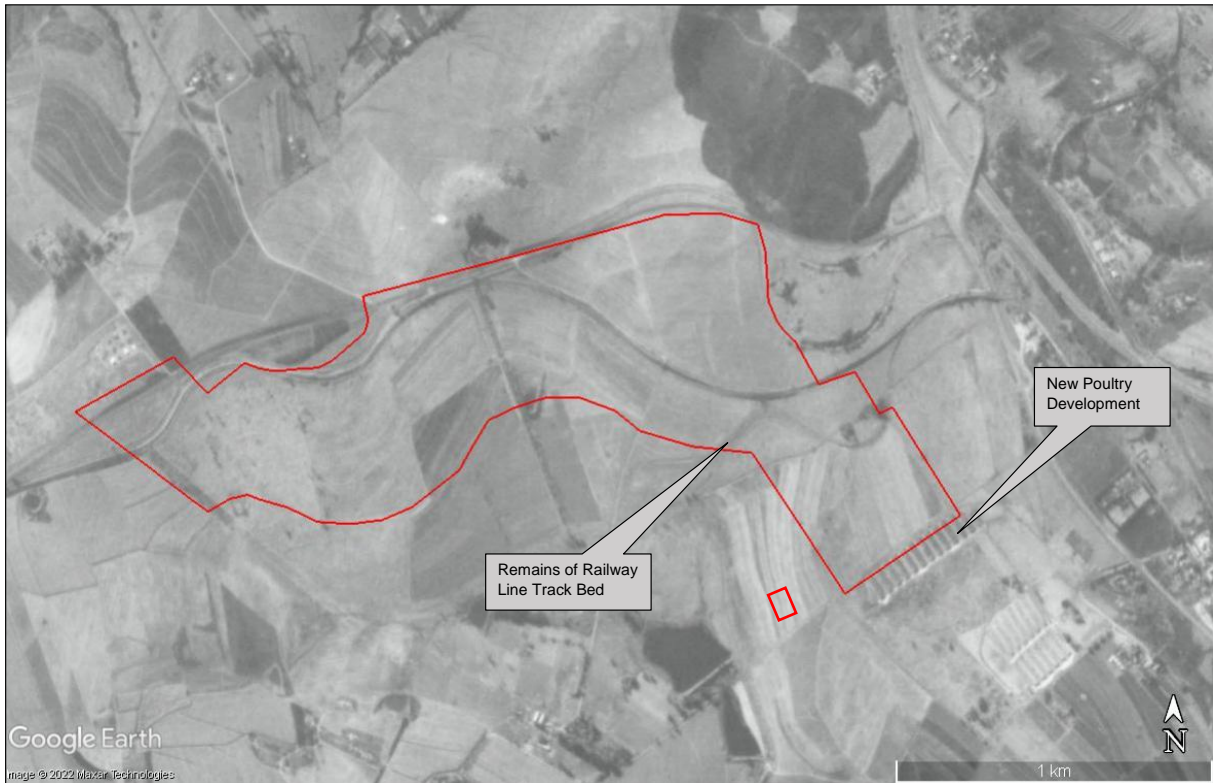
Aerial imagery from 1959 shows the large-scale transformation of the site to cultivated land comprising maize and sugar cane (Figure 8). There is an area of forestry (wattle) in the western part of the site. The narrow gauge railway line is still evident on the site. In addition, the Transnet Limited railway line is now evident across the central portion of the site. This railway line was established prior to 1952.



**Figure 8: Historic aerial imagery of the development site from 1959 shows most of the site under cultivation. The Transnet Limited railway line is now evident across the central portion of the site.**

Historical aerial imagery from 1989 shows little change in terms of land use on the site, with the site still under cultivation (Figure 9). There is evidence of growing development in the larger Camperdown area with, for example, the establishment of a poultry operation adjacent to the south eastern boundary of the study site. Of most significance however is the decommissioning and removal of the Umlaas Road to Mid-Illovo Branch of the Natal Narrow Gauge Railway by 1989. All of the narrow gauge rails have been lifted along the line and only the remains of the trackbed can be seen on the site in the 1989 imagery.

Aerial imagery from 1998 shows the entire site under sugar cane cultivation (Figure 10). The historic position (trackbed) of the narrow gauge railway line is still somewhat evident on the site, but has now been incorporated into the access tracks/contouring for the sugar cane fields. By 2006 all evidence of the historic railway line has largely disappeared (Figure 11).



**Figure 9: Historic aerial imagery of the development site from 1989 shows that the Umlaas Road to Mid-Illovo Narrow Gauge Railway Line has been decommissioned and removed. Only the remains of the trackbed are still evident on the site.**



**Figure 10: Historic aerial imagery of the development site from 1998 showing the entire site under sugar cane cultivation. The historic position of the railway line track bed can still be seen on the site but has now been incorporated into the cultivation.**





**Figure 11: Google Earth imagery of the development site from 2006. All evidence of the narrow gauge railway line has largely disappeared.**

The results of the desktop assessment show that the transformation of the site from grassland to cultivation began on a large scale in the late 1940s/early 1950s, with almost the entire site under cultivation by 1959. The earliest built structure was established on the site in 1911 and comprised a portion of the Umlaas Road to Mid-Illovo Narrow Gauge Railway Line. This railway line was decommissioned in 1985 and the rails were lifted between 1985 and 1987. All evidence of the railway line (trackbed) on the site was gone by the mid-2000s. A second railway line belonging to Transnet Limited was established on the site prior to 1952. This railway line is no longer in use and the track has been removed, and in-filled in some places, however the railway servitude is still present on the site. The railway servitude has been completely excluded from the development footprint. No other heritage resources are evident on the site surface in the historic aerial imagery of the site. In addition, as the study site has been completely transformed through cultivation, it is likely that any subsurface heritage resources that may have been present on the site have been disturbed and/or destroyed.

## 9.2 GROUND SURVEY

No development activities associated with the proposed establishment of the Umlaas Junction Private Light Industrial Estate had begun at the time of the ground survey. No heritage resources were identified on the 140ha development footprint as outlined in Table 3 below.

**Table 3: List of Possible Heritage Resources and Assessment Findings**

Heritage Resource Type	Finding
Places, buildings, structures and equipment of cultural significance	None were identified during the Ground Survey. A portion of the historic Umlaas Road to Mid-Illovo Narrow Gauge Railway Line previously traversed the site. The railway line was decommissioned in 1985 and the track was lifted by 1987.
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
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 4 below.

**Table 4: 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.	None

### 9.3 SITE SIGNIFICANCE AND FIELD RATING

The field rating system (Table 5) as developed by SAHRA (2007, 2016) does not apply to the proposed Umlaas Junction Light Industrial Estate development in Camperdown as no heritage sites occur on the development footprint.

**Table 5: 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 results of the Desktop PIA show that the “moderate sensitivity” in terms of the SAHRIS palaeo-sensitivity is applicable to almost the entire development site with the exception of the northern most boundary of the site, which comprises a localized dolerite intrusion with a zero fossil sensitivity rating. The excavations for the proposed development will expose sediments of both the Dwyka and Pietermaritzburg Formations. Based on the study findings, the Dwyka Group rock underlying the central portion of the site comprises tillite, deposited in a cold, glacial environment, which is not conducive to fossilization. The shale rock which is present in the north western and south eastern portions of the site comprise shallow to deeper water Pietermaritzburg Formation sediments. The only fossil finds associated with the Pietermaritzburg Formation shale sediments in this part of KwaZulu-Natal comprise invertebrate trace fossils (Bamford, 2020). Lastly, the Jurassic age dolerite which is present in the most northern portion of the site comprises a non-fossiliferous rock type which, by its nature as an intrusive volcanic rock, has the potential to damage or destroy fossils preserved in adjacent fossiliferous deposits (Trower, 2021). As the site occurs on a contact zone between the Dwyka Group and Pietermaritzburg Formation and intrusive volcanic lavas, the extreme heat and pressure from the lava intrusion would likely have destroyed any potential fossils that may have been present within the vicinity of the contact zone (Trower, 2021).

As such, no well preserved fossils are expected to be present on the study site. However, in the unlikely event that the development excavations expose fossil material, the chance find protocol in Appendix C must be implemented.

## 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 6 below have been used to identify, predict and assess the significance of any potential heritage and palaeontological related impacts associated with the proposed Umlaas Junction Light Industrial Estate development on Rem of the Farm Crookes No. 15732 in the Camperdown area.

As no heritage sites or resources have been identified on the development footprint; the area is not part of any known cultural landscape; and it is highly unlikely that fossils are present within the development site footprint; the proposed activity poses a minimal risk to heritage and palaeontological resources, as shown in Table 7 below.

**Table 6: Summary of Aspects used for Assessing Heritage / Palaeontological Impacts**

Aspect	Rating	Description
<b>Nature</b>	Positive	The impact on the resource will be positive.
	Negative	The impact on the resource will be negative.
<b>Probability (with mitigation)</b>	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%).
	Unlikely	It is unlikely that the impact will occur (0% - 29%).
<b>Reversibility (with mitigation)</b>	Possible	It is possible to reverse the impact.
	Partly	It is partly possible to reverse the impact.
	Not possible	It is not possible to reverse the impact.
<b>Extent</b>	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.
	National	The impact will affect areas beyond the Province but within the boundaries of South Africa.
<b>Duration</b>	Short-term	0-5 years (construction phase).
	Medium-term	5-40 years (construction and operation).
	Long-term	(>40 years).
	Permanent	Permanent damage to the resource.
<b>Significance of Impact without Mitigation</b>	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.
	High	Significant impact / disturbance expected.
<b>Significance of Impact Post-Mitigation</b>	Low	Small impact / disturbance.
	Medium	Moderate impact / disturbance expected.
	High	Significant impact / disturbance expected.

**Table 7: Impact Assessment Results for the Umlaas Junction Light Industrial Estate Development**

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 light industrial estate 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 heritage resource.
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 Umlaas Junction Light Industrial Estate on Rem of the Farm Crookes No. 15732 identified no heritage sites or features on the development footprint. The area also does not form part of any known cultural landscape. It is also highly unlikely that fossils are present within the development footprint due to the nature of the bedrock (Dwyka Group glacial tillite and Pietermaritzburg Formation shale) and geological conditions present at the site and surrounding area. The proposed development may therefore proceed as no heritage or paleontological features are threatened by the light industrial estate development.

In the unlikely event that the proposed development exposes any graves, fossils or other heritage features on the development footprint, all activities must cease and the Environmental Control Officer (ECO) appointed for the development project must be contacted. The ECO must in turn notify the provincial heritage resource authority, the KwaZulu-Natal Amafa and Research Institute and/or the heritage consultant, and the chance find protocol in Appendix C must be implemented.

The proposed development must adhere to the requirements of the NHRA and the KwaZulu-Natal Amafa and Research Institute Act, and Draft Regulations, which requires that a person that discovers any archaeological or palaeontological material or a meteorite must immediately cease all operations or activity within a 25m radius of the discovery, and must notify the KwaZulu-Natal Amafa and Research Institute. In addition, no structures older than sixty years or parts thereof are allowed to be demolished, altered or extended without a permit from the KwaZulu-Natal Amafa and Research

Institute. Under no circumstances may any heritage material be destroyed or removed from site unless under direction of the KwaZulu-Natal Amafa and Research Institute and appointed heritage consultant.

## 12 REFERENCES

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

## 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](mailto: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, Geology 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	CLIENT	AUTHORISATION PROCESS
<ul style="list-style-type: none"> <li>• <b>Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment:</b> for the proposed establishment of a 20ha cemetery located on Portion 43 of the Farm Honig Krantz No. 945 in the Cato Ridge Area of the Mkhambathini Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. (January 2022).</li> </ul>	Timbali Memorial Park (Pty) Ltd	Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment
<ul style="list-style-type: none"> <li>• <b>Phase 1 Heritage Impact Assessment:</b> for the proposed establishment of a second residential development at Beacon Hill Country Estate on Portion 5 of Erf 1280 and a game park on Portion 9 of Erf 1280 in Bishopstowe, Pietermaritzburg, Msunduzi Local and uMgungundlovu District Municipality, KwaZulu-Natal. (December 2021).</li> </ul>	Beacon Hill Farming (Pty) Ltd	Phase 1 Heritage Impact Assessment
<ul style="list-style-type: none"> <li>• <b>Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment:</b> for the proposed establishment of the Richmond Cemetery in Richmond, Richmond Local Municipality and uMgungundlovu District Municipality, KwaZulu-Natal. (November 2021).</li> </ul>	Richmond Local Municipality	Phase 1 Heritage Impact Assessment and Desktop Palaeontological Impact Assessment
<ul style="list-style-type: none"> <li>• <b>Cultural Heritage Resource Identification, Mapping and Assessment:</b> for the larger Environmental Management Framework (EMF) for the Msunduzi Local Municipality, KwaZulu-Natal.</li> </ul>	Msunduzi Local Municipality	Heritage Identification and GIS Mapping
<ul style="list-style-type: none"> <li>• <b>Basic Assessment Process and Environmental Auditing:</b> 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.</li> </ul>	KwaZulu-Natal Arts and Culture Trust	Basic Assessment Process and Environmental Auditing

**APPENDIX B: SITE PHOTOGRAPHS**



**Plate 1: Photograph showing the southern portion of the site with an off-site farm dam in the background.**



**Plate 2: Photograph showing the central portion of the site, facing westwards.**



**Plate 3: Photograph showing the eastern portion of the site with the Onelogix Umlaas Road facility in the background.**



**Plate 4: Photograph showing the northern portion of the site with the Gromor complex in the background.**



**Plate 5: Photograph showing the western portion of the site.**



**Plate 6: Area on the site where the historic narrow gauge railway line previously traversed, and which now forms part of the sugar cane contouring.**



**Plate 7: Area on the site where the historic narrow gauge railway line previously traversed, and which now forms part of the sugar cane contouring.**



**Plate 8: Transnet Limited railway servitude which traverses the central portion of the site. Portions of the servitude have been in-filled as shown in Plate 8 and are used as a road.**



**Plate 9: Portion of the Transnet Limited railway servitude which has not been in-filled.**



**Plate 10: Sugar cane stockpiling and loading area on the northern boundary of the 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 fossils, 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) and the KwaZulu-Natal Amafa and Research Institute Draft Regulations, 2021.

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 immediately cease, with a radius of at least 25 meters of the site or discovery, and further disturbance of the heritage resource must be avoided.
- The ECO and project manager/developer 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) and the KwaZulu-Natal Amafa and Research Institute Act (2018), a written report must be submitted to the KwaZulu-Natal Amafa and Research Institute within a period of 30 days from the date of making such a discovery.
- The report must include – the names of the person reporting; the object discovered; the time and date of such discovery; the location of such discovery; and the municipal area within which the discovery was made.
- The Provincial Heritage Resource Authority (PHRA) may require that a full Heritage Impact Assessment (HIA) to 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) If 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) and the KwaZulu-Natal Amafa and Research Institute Act (2018), a written report must be submitted to the KwaZulu-Natal Amafa and Research Institute within a period of 30 days from the date of making such a discovery.
- 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 the NHRA (1999) and the KwaZulu-Natal Amafa and Research Institute Act (2018).

### **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 heritage consultant. 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 heritage consultant. 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 heritage consultant. 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 heritage consultant 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.