HIA SURVEY OF THE PROPOSED IZINGA DEVELOPMENT, UMHLANGA, KZN

FOR WALLACE & GREEN

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By Gavin Anderson

Umlando: Archaeological Surveys and Heritage Management

PO Box 10153, Meerensee, 3901

Phone:035-7531785 Cell: 0836585362

umlando@gmail.com

ABSTRACT

A HIA survey and PIA desktop was undertaken for the proposed Izinga Eco Estate Ddevelopment. The area was resurveyed due to the last HIA report being more than 10 years old, and that two known archaeological sites were not noted. In addition to this, the Umhlanga Cemetery area was now included into the general study area. A permit for the sites 2931CA 010 and 2931CA 100 will be required.

The survey noted that the Umhlanga Cemetery currently has no access road due to the Izinga Eco Estate Development. The housing proposal has granted access to the cemetery.

A smaller graveyard was located along the western border of the property. This was for the workers and family members at Burnside. A 20m buffer around the graves will be needed, or they could be relocated. Another alternative would be to place the property wall east of the graves.

The archaeological site 2931CA 010, was originally recorded in the 1930s, and then late 1960s. By 1960s it was noted that the site was much disturbed. The current survey assessed the site after it was cleared of sugarcane. The site remains of low significance and can be destroyed after a permit has been granted. The other site 2931CA 100 is more of a continual scatter of Stone Age artefacts in a lag deposit. No further mitigation is required.

The PIA desktop noted that while the area is of high and very high significance, it is highly unlikely that fossil remains will be found in the fossil bearing layers. A Chance Find Protocol was suggested for Phase 2.

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Abbreviations

HP	Historical Period
IIA	Indeterminate Iron Age
LIA	Late Iron Age
EIA	Early Iron Age
ISA	Indeterminate Stone Age
ESA	Early Stone Age
MSA	Middle Stone Age
LSA	Late Stone Age
HIA	Heritage Impact Assessment
PIA	Palaeontological Impact Assessment

INTRODUCTION

Tongaat Hullett Developments (THD) (Pty) Ltd was granted Environmental Authorisation on the 02 September 2010 for the development of the Izinga Phase 2 (Izinga iii) Residential Development on Portions 473, 80 and 81 of Farm Lot 31 No. 1560, Rem of Lot A 39 No. 1532, Rem of Lot B 39 No. 1533, Rem of Portions 21, 22, 23, 418, 419, 43 and 441 of Farm Lot 31 No. 1560.

Since the approval of the Environmental Authorisation, Portions 80 and 81 of Farm Lot 31 No.1560 and Rem of Portions 21, 22 and 441 of Farm Lot 31 No. 1560 have been subdivided into the following properties:

- Erf 3456 Umhlanga Rocks
- Rem of Erf 3434 Umhlanga Rocks
- REM of Erf 3457 Umhlanga Rocks
- Portion 1 of Erf 3465 Umhlanga Rocks
- Portion 2 of Erf 3465 Umhlanga Rocks
- Portion 3 of Erf 3465 Umhlanga Rocks
- Portion 4 of Erf 3465 Umhlanga Rocks
- Portion 5 of Erf 3465 Umhlanga Rocks
- Portion 6 of Erf 3465 Umhlanga Rocks
- Portion 7 or Erf 3465 Umhlanga Rocks
- Portion 8 of Erf 3465 Umhlanga Rocks
- Portion 9 of Erf 3465 Umhlanga Rocks
- Portion 10 of Erf 3465 Umhlanga Rocks
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- Portion 12 of Erf 3465 Umhlanga Rocks
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- Portion 14 of Erf 3465 Umhlanga Rocks
- Portion 15 of Erf 3465 Umhlanga Rocks

- Portion 16 of Erf 3465 Umhlanga Rocks
- Portion 17 of Erf 3465 Umhlanga Rocks
- Portion 18 of Erf 3465 Umhlanga Rocks
- Portion 19 of Erf 3465 Umhlanga Rocks
- Portion 20 of Erf 3465 Umhlanga Rocks
- Portion 21 of Erf 3465 Umhlanga Rocks
- Portion 22 of Erf 3465 Umhlanga Rocks
- Portion 23 of Erf 3465 Umhlanga Rocks
- Portion 24 of Erf 3465 Umhlanga Rocks
- Portion 25 of Erf 3465 Umhlanga Rocks
- Portion 26 of Erf 3465 Umhlanga Rocks

Balwin Properties purchased approximately 64Ha of the land and intends on establishing the Izinga Eco Estate. Phase 1 has already commenced. The remainder of the site will also be developed into residential units. The overall number of units for the project is approximately 4000 units, which also includes a proposed school and lifestyle centre.

Umlando was requested to undertake an assessment of the proposed development, due to the elapsed time from the previous survey. I noted that two archaeological sites within the study area were recorded pre-2000, but were not mentioned in the HIA report. These sites would need re-assessment.

Figures 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT

FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT (2002)

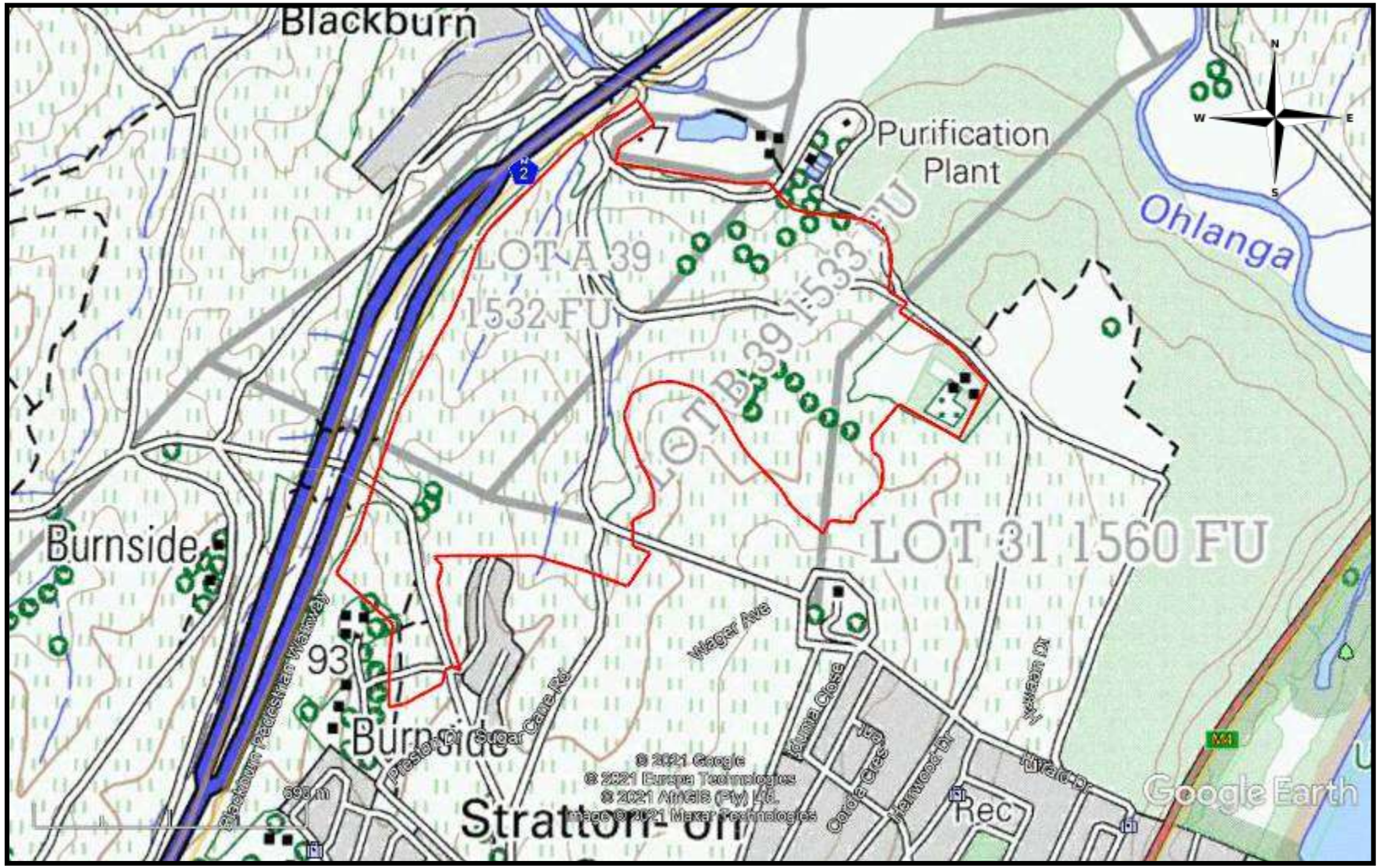


FIG. 4: SCENIC VIEW OF THE STUDY AREA

KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018

"General protection: Structures.—

- No structure which is, or which may reasonably be expected to be older than 60 years, may be demolished, altered or added to without the prior written approval of the Council having been obtained on written application to the Council.
- Where the Council does not grant approval, the Council must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- The Council may, by notice in the *Gazette*, exempt—
- A defined geographical area; or
- defined categories of sites within a defined geographical area, from the provisions of subsection where the Council is satisfied that heritage resources falling in the defined geographical area or category have been identified and are adequately protected in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.
- A notice referred to in subsection (2) may, by notice in the *Gazette*, be amended or withdrawn by the Council.

General protection: Graves of victims of conflict.—No person may damage, alter, exhume, or remove from its original position—

- the grave of a victim of conflict;
- a cemetery made up of such graves; or
- any part of a cemetery containing such graves, without the prior written approval of the Council having been obtained on written application to the Council.
- General protection: Traditional burial places.—
- No grave—
- not otherwise protected by this Act; and
- not located in a formal cemetery managed or administered by a local authority, may be damaged, altered, exhumed, removed from its original

position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council.

The Council may only issue written approval once the Council is satisfied that—

- the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and
- the applicant and the relevant communities or individuals have reached agreement regarding the grave.

General protection: Battlefield sites, archaeological sites, rock art sites, palaeontological sites, historic fortifications, meteorite or meteorite impact sites.—

- No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- Upon discovery of archaeological or palaeontological material or a meteorite by any person, all activity or operations in the general vicinity of such material or meteorite must cease forthwith and a person who made the discovery must submit a written report to the Council without delay.
- The Council may, after consultation with an owner or controlling authority, by way of written notice served on the owner or controlling authority, prohibit any activity considered by the Council to be inappropriate within 50 metres of a rock art site.
- No person may exhume, remove from its original position or otherwise disturb, damage, destroy, own or collect any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site without the prior written approval of the Council having been obtained on written application to the Council.
- No person may bring any equipment which assists in the detection of metals and archaeological and palaeontological objects and material, or

excavation equipment onto any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, or meteorite impact site, or use similar detection or excavation equipment for the recovery of meteorites, without the prior written approval of the Council having been obtained on written application to the Council.

- The ownership of any object or material associated with any battlefield site, archaeological site, rock art site, palaeontological site, historic fortification, meteorite or meteorite impact site, on discovery, vest in the Provincial Government and the Council is regarded as the custodian on behalf of the Provincial Government."

METHOD

The method for Heritage assessment consists of several steps.

The first step forms part of the desktop assessment. Here we would consult the database that has been collated by Umlando. This databases contains archaeological site locations and basic information from several provinces (information from Umlando surveys and some colleagues), most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). We use 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs where available, to assist in general location and dating of buildings and/or graves. The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies. Where required we would consult with a local data recording centre, however these tend to be fragmented between different institutions and areas and thus difficult to access at times. We also consult with an historical architect, palaeontologist, and an historian where necessary.

The survey results will define the significance of each recorded site, as well as a management plan.

All sites are grouped according to low, medium, and high significance for the purpose of this report. Sites of low significance have no diagnostic artefacts or features. Sites of medium significance have diagnostic artefacts or features and these sites tend to be sampled. Sampling includes the collection of artefacts for future analysis. All diagnostic pottery, such as rims, lips, and decorated sherds are sampled, while bone, stone, and shell are mostly noted. Sampling usually occurs on most sites. Sites of high significance are excavated and/or extensively sampled. Those sites that are extensively sampled have high research potential, yet poor preservation of features.

Defining significance

Heritage sites vary according to significance and several different criteria relate to each type of site. However, there are several criteria that allow for a general significance rating of archaeological sites.

These criteria are:

1. State of preservation of:

1.1. Organic remains:
1.1.1. Faunal
1.1.2. Botanical
1.2. Rock art
1.3. Walling
1.4. Presence of a cultural deposit
1.5. Features:
1.5.1. Ash Features
1.5.2. Graves

1.5.3. Middens

1.5.4. Cattle byres

1.5.5. Bedding and ash complexes

2. Spatial arrangements:

2.1. Internal housing arrangements

2.2. Intra-site settlement patterns

2.3. Inter-site settlement patterns

3. Features of the site:

3.1. Are there any unusual, unique or rare artefacts or images at the site?

3.2. Is it a type site?

3.3. Does the site have a very good example of a specific time period, feature, or artefact?

4. Research:

4.1. Providing information on current research projects

4.2. Salvaging information for potential future research projects

5. Inter- and intra-site variability

5.1. Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?

5.2. Can this particular site yield information about a community's social relationships within itself, or between other communities?

6. Archaeological Experience:

6.1. The personal experience and expertise of the CRM practitioner should not be ignored. Experience can indicate sites that have potentially significant aspects, but need to be tested prior to any conclusions.

7. Educational:

7.1. Does the site have the potential to be used as an educational instrument?

7.2. Does the site have the potential to become a tourist attraction?

7.3. The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.

8. Other Heritage Significance:

8.1. Palaeontological sites

8.2. Historical buildings

8.3. Battlefields and general Anglo-Zulu and Anglo-Boer sites

8.4. Graves and/or community cemeteries

8.5. Living Heritage Sites

8.6. Cultural Landscapes, that includes old trees, hills, mountains, rivers, etc related to cultural or historical experiences.

The more a site can fulfill the above criteria, the more significant it becomes. Test-pit excavations are used to test the full potential of an archaeological deposit. This occurs in Phase 2. These test-pit excavations may require further excavations if the site is of significance (Phase 3). Sites may also be mapped and/or have artefacts sampled as a form of mitigation. Sampling normally occurs when the artefacts may be good examples of their type, but are not in a primary archaeological context. Mapping records the spatial relationship between features and artefacts. Table 1 lists the grading system.

TABLE 1: SAHRA GRADINGS FOR HERITAGE SITES

SITE SIGNIFICANCE	FIELD RATING	GRADE	RECOMMENDED MITIGATION
High Significance	National Significance	Grade 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	
High / Medium Significance	Generally Protected A		Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B		Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C		On-site sampling monitoring or no archaeological mitigation required prior to or during development / destruction

RESULTS

DESKTOP STUDY

The desktop study consisted of analysing various maps for evidence of prior habitation in the study area, as well as for previous archaeological surveys. Many archaeological sites occur in the general area. The archaeological sites tend to be open Stone Age scatters of low significance. Early and/or Late Iron Age sites, as well as Historical Period Sites of low to high significance occur in the general area (fig. 5). Two known sites occur within the study area, of which one occurs within Phase 1 and 2.

eThembeni undertook a HIA of the study area in 2009. They recorded one Historical Period site in the Phase 1 area, but do not mention 2931CA 010 nor 2931CA 100 in the Phase 2 area.

2931CA 010 was noted in 1977 by Oliver Davies. He states:

> "About 1/2 mile south of the new bridge at about 180' S.L. is the junction of rock and red dune-sand. On the rock-surface are a few rounded boulders, all apparently dolerite, very weathered but probably neither marine nor riverine. The rock-surface is fairly level but it does not seem to be a planed terrace.
>
> One of the boulders on the rock surface seemed to be split across with a negative bulb of percussion, and a smaller flake seemed to have been taken off; but it was considered to be too uncertain to collect? (KZN Museum site record database)

2931CA 010 appears to be a Middle Stone Age site.

2931CA 100 was originally recorded in 1935 by Schofield, and revisited in 1977 by Davies. Davies describes the site as follows:

> "A rather discontinuous deposit of shells.
> Schofield probably saw the midden in a fresher state than today and says it was about 2' below surface.

I saw in 1948 a few plain sherds and stone chips. Schofield describes pottery from the site... Schofield claimed that the three pieces in illustration are NC1" (KZN Museum site record database).

2931CA 100 is a possible Early Iron Age site

The database thus notes that there are three archaeological sites within the total study area.

The Surveyor General notes that the land was first granted in 1850 and 1860 (fig.'s 6 – 8). Fig 8 is interesting for the two names that occur on it: JC Byrnes and J. Moreland. The former being the agent and the latter was his surveyor.

"Hundreds of settlers from Britain arrived in a controversial emigration scheme orchestrated by Joseph Byrne, with assistance from his agent John Moreland and their shipping connections and financial backers. They became known for settling in what became known as Byrne valley, near Richmond, one of the more successful aspects of the ultimately failed scheme.

Promised a land of great opportunity, some of the Byrne settlers were indeed allocated quality land and, by all accounts, prospered as they had imagined they would. Many, however, faced a passage of hardship and suffering and, if they and their offspring survived the ships, went to collect their promised land, only to be disappointed at its lack of quality for suitable farming, construction and water supply.

After his surveys, Moreland purchased for the settlers land in Richmond/ Byrne area, Verulam, Mount Moreland, New Glasgow, and farms around Pietermaritzburg, Thornville, and York (near New Hanover).

Those who were unhappy with their land and had the means, leased or purchased more suitable land at additional cost, while others bit the bullet and held on until they could move to other locations where they could find better land to buy, in some cases from Afrikaners who wanted to leave Natal. However, much of the good land had already been bought up and Moreland struggled to find suitable land for all – ie well-watered, with good soil, access to timber for firewood and building purposes, and within easy distance of either Pietermaritzburg or Durban

"Before approaching the Secretary of State, it was necessary to make sure of professional and financial assistance. Byrne had no intention of himself accompanying his emigrants, and the services of an agent and surveyor was the first consideration. Here Byrne was distinctly fortunately. John Moreland, a surveyor and engineer of considerable ability, was on the point of concluding an agreement to go to Australia when crossing Pall Mall he saw a placard advertising Byrne's scheme."

An economic depression had hit Britain and Moreland was looking for employment and security. He needed to find a home for his wife and family, the author noted.

"When he (Moreland) had read Byrne's prospectus, Natal appealed to him more than either Ceylon or New South Wales. Finally he decided to engage himself to Byrne. Under the contract Byrne guaranteed that Moreland should receive not less than 100 pounds annually in respect of fees for survey and conveyance of emigrants' allotments. Moreover, he was to be assigned a quantity of land varying with the number of immigrants introduced in any year. He was also to receive 50 pounds a year in travelling allowances." (https://meanderchronicle.co.za/the-byrne-settlers-and-natal-part-1/).

Needless to say that the whole scheme collapsed and by 1850 Byrne was bankrupt, while Moreland made legal claims against Byrne. Mount Moreland was named after him.

The 1937 aerial photograph (fig. 9) and 1942 topographical map (fig. 10) indicate that there are no buildings within the study area.

FIG. 5: LOCATION OF KNOWN HERITAGE SITES IN THE GENERAL AREA

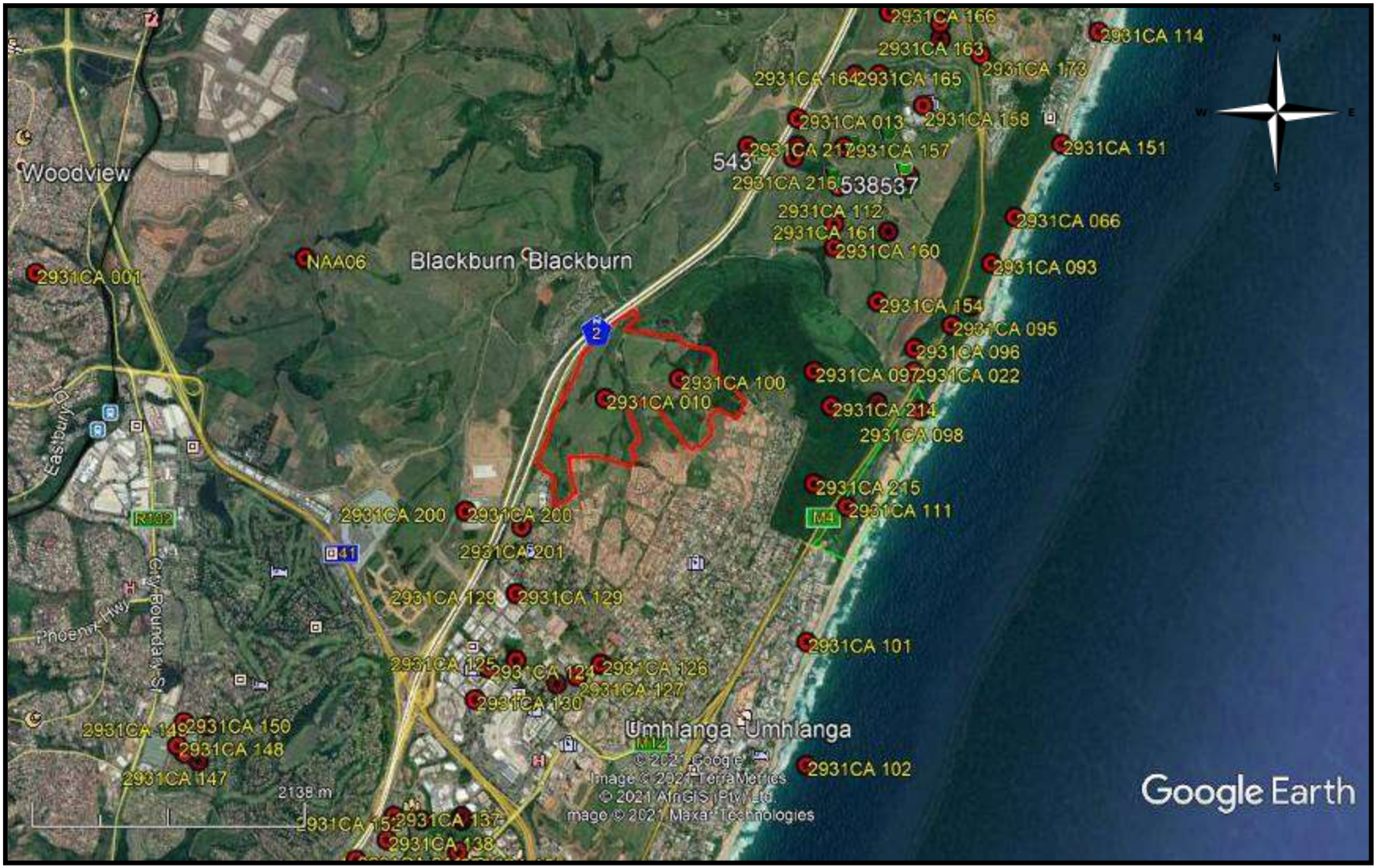


FIG. 6: DEEDS OFFICE MAP FOR LOT A 39 (1850)

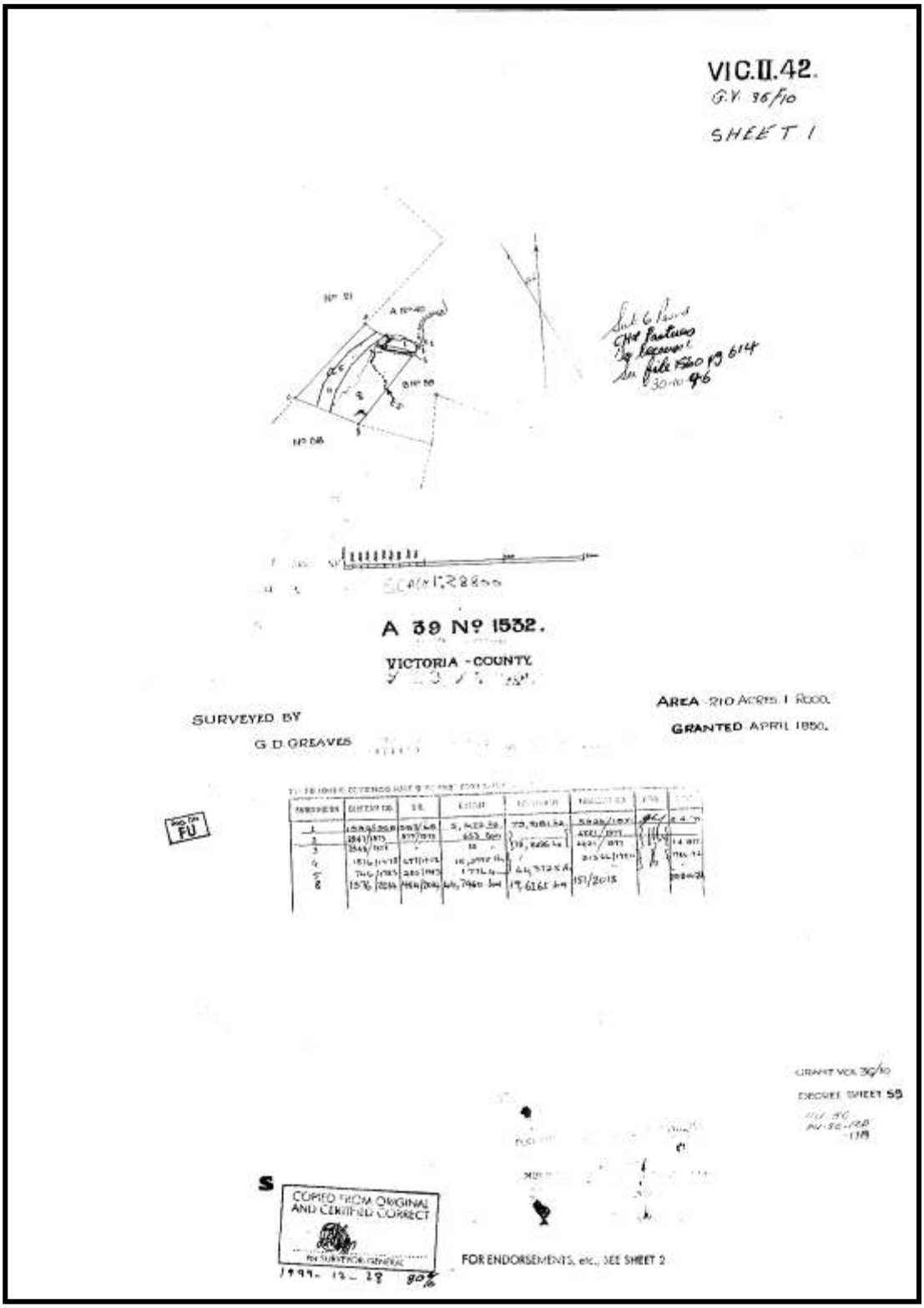


FIG. 7: ORIGINAL DEEDS OFFICE MAP FOR PLOT B 39 (1850)

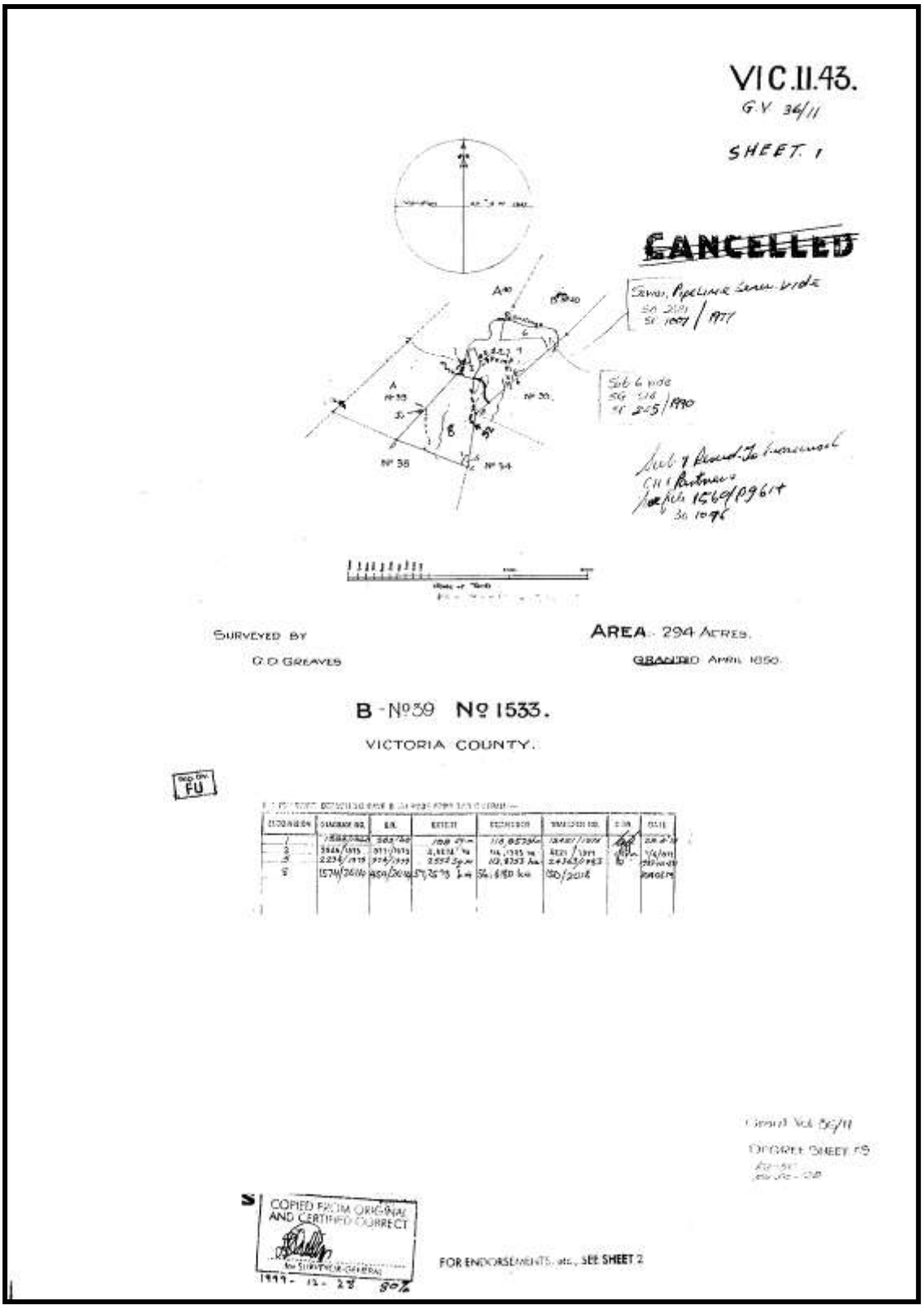


FIG. 8: DEEDS OFFICE MAP FOR LOT B 39 (1861)

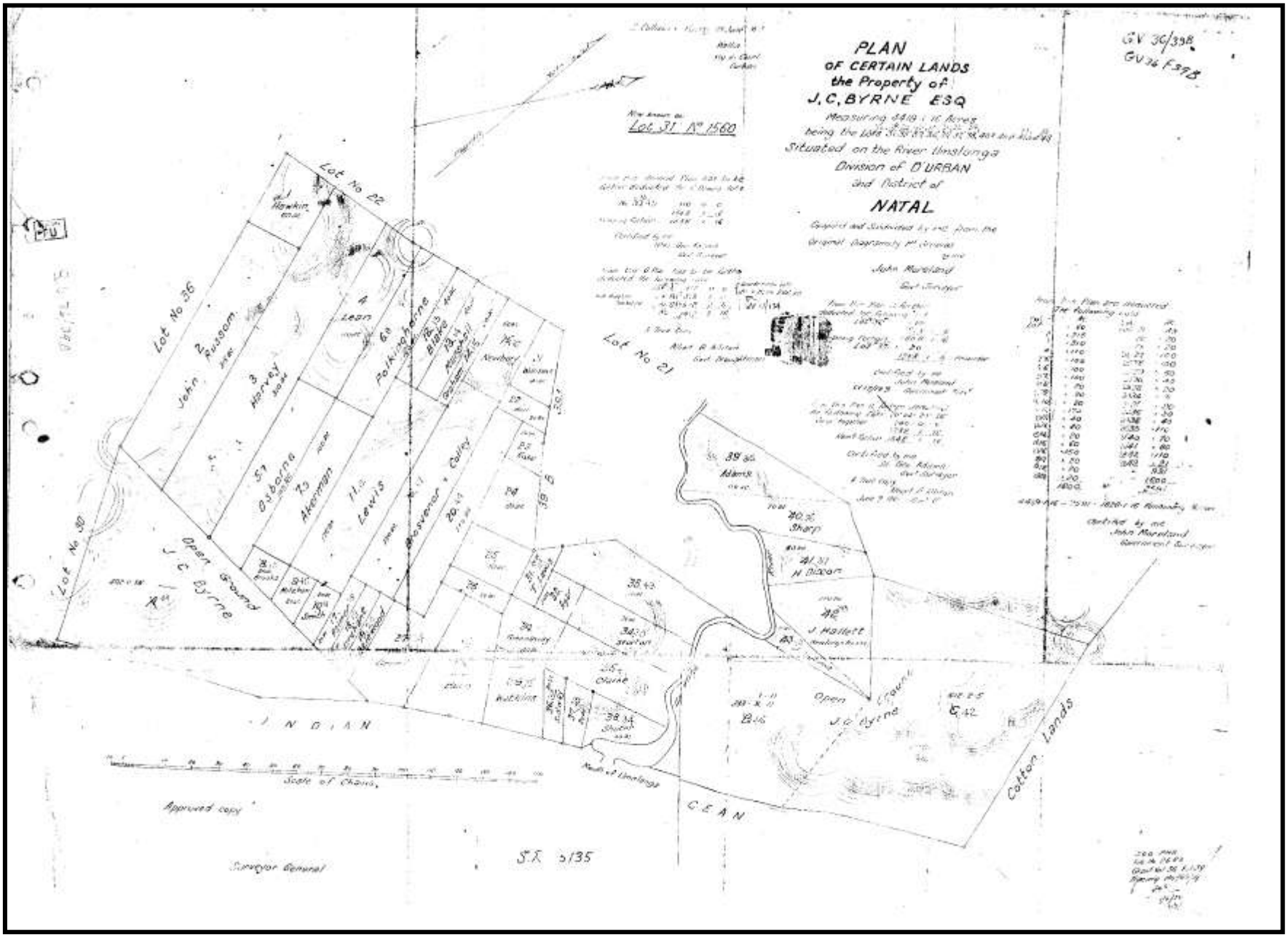


FIG. 9: 1937 AERIAL PHOTOGRAPH OF THE STUDY AREA

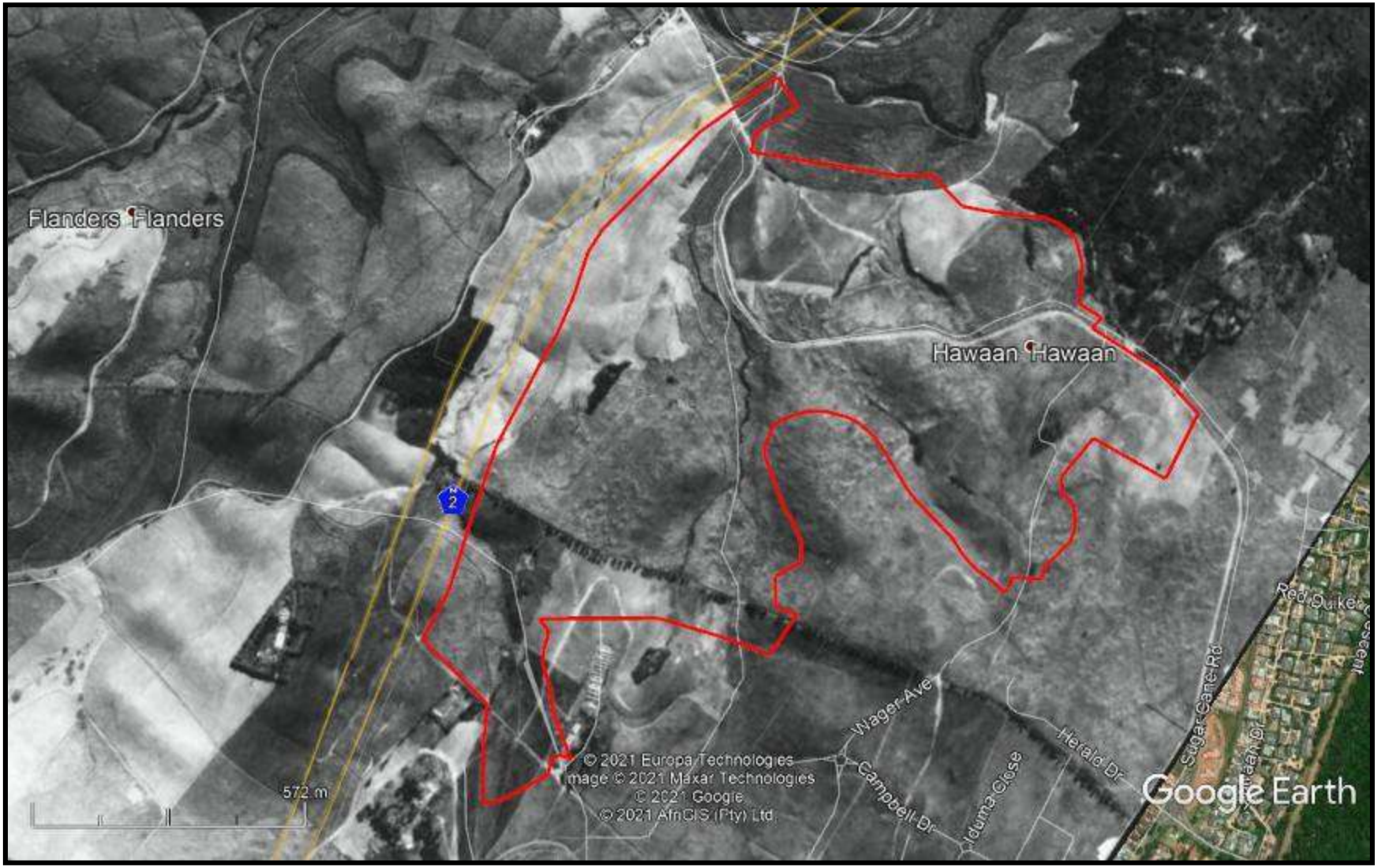
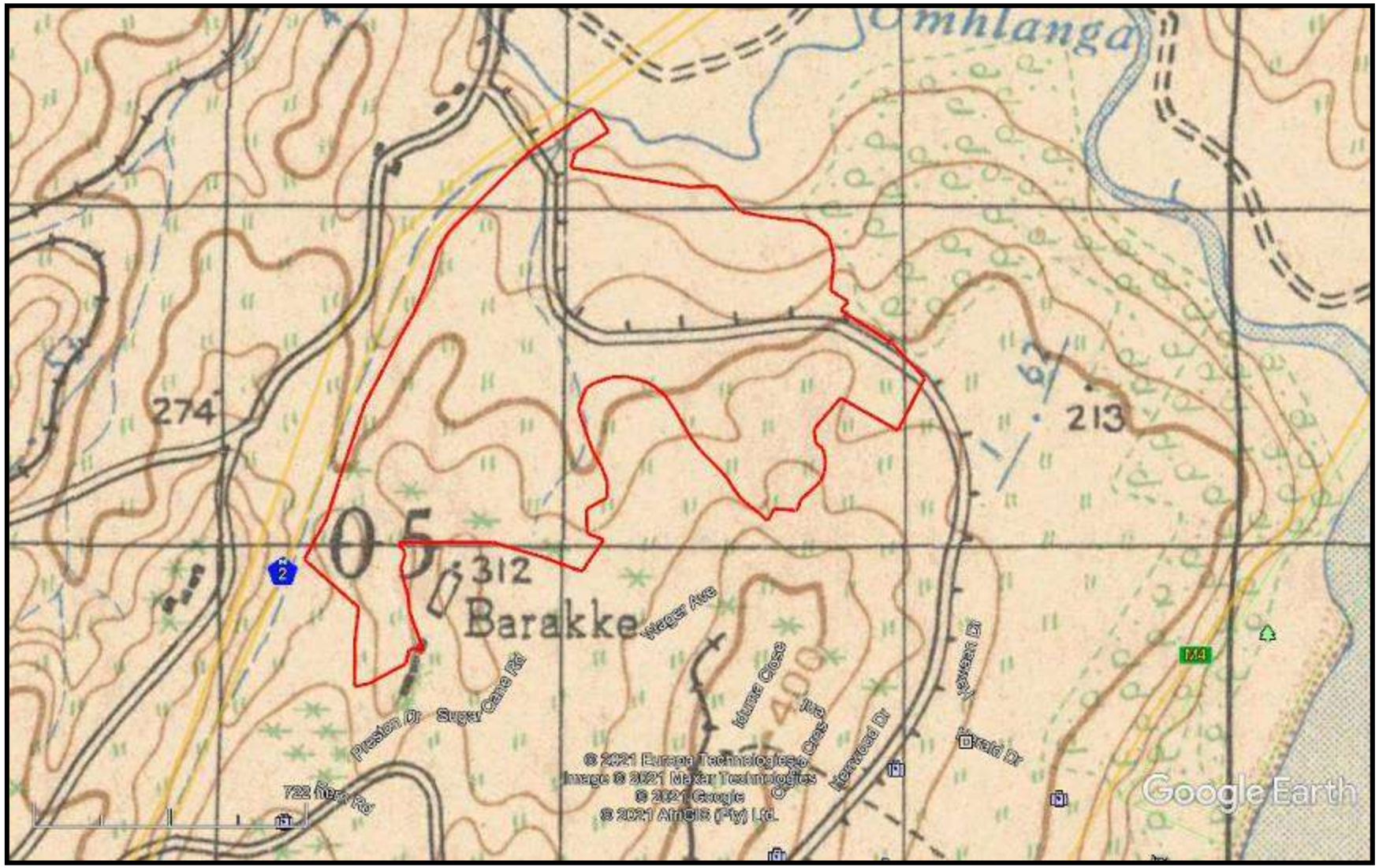


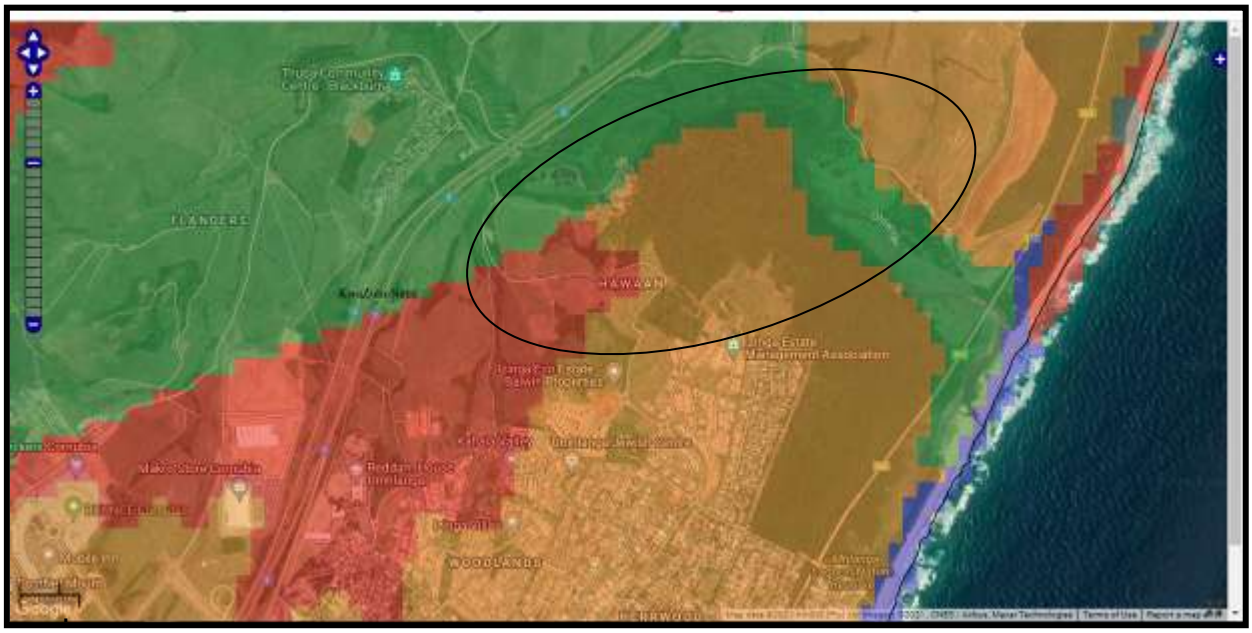
FIG. 10: 1942 TOPOGRAPHICAL MAP OF THE STUDY AREA



PALAEONTOLOGICAL SENSITIVITY

The area is in an area of very high to medium palaeontological sensitivity (fig. 11). A PIA desktop was undertaken by Dr A Smith (Appendix A). Dr Smith states: The chance of fossils being found on this site is **Low,** but not **Zero.** A **"Chance Find Protocol"** has been included to cover this eventuality. No further palaeontological work is required, unless triggered by the "**Chance Find Protocol**", which must form part of the Environmental Management Programme (EMPr) for the site."

FIG. 11: PALAEONTOLOGICAL SENSITIVITY MAP



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

FIELD SURVEY

Umlando undertook the field survey on 9 June and 11 August 2021. Ground visibility was very poor in all areas due to the dense sugar cane, bushes and ground cover. The ground cover for 2931CA 010 was originally too dense to undertake the survey. This was later cleared for re-assessment. Much of the area is on slopes that would not be used for human occupations. Only two hills were potential areas for human occupation. Fig. 12 shows the location of recorded sites, while Table 2 lists the sites.

The Umhlanga Cemetery occurs in the northeastern part of the study area (fig. 13). The only current access to the cemetery is via the dirt road, or contractor's road entrance in the southwest part of the study area. This road makes the last part of the road inaccessible for non 4x4s due to construction activity. The Umhlanga Cemetery will not be directly affected by the development and there are currently no plans to relocate the human remains. The development will apparently not restrict access to the cemetery. However, the proposed development will probably have controlled access at a security gate. This means that the public will not be able to access the cemetery easily. According to the KZNARI Act, **a landowner may not restrict access to a grave or cemetery**. I suggest that the cemetery is cordoned off from the study area and a new access road is made that allows public to gain entry to the cemetery. The alternative is that an access system must be in place where members of the public can easily access the cemetery. The public accessibility to the cemetery must form part of the EMP.

Subsequent to the survey, I was informed of a cemetery that occurs on the western border of the development next to the school. These graves were identified in May/June 2021. The graves occur in dense vegetation and were not observed in my, nor eThembeni's, survey. The graves are of Mr and Mrs Govender, the wife of a pump attendant (a Mr Nineboy), and Mr Govindsamy, and the daughter of Mr Ramsamy. These people worked at the Burnside Estate in the 1970s. Since this is an

informal cemetery, and not registered, it is automatically protected by the KZNARI Act of 2018.

The graves have been accurately recorded by the land surveyor since the survey. These graves were revisited in August and recorded (fig. 14). The graves are in a very dilapidated state and would probably not be observed unless one was informed about them. I was told where the graves were when I was on site, and then I still had difficulty seeing them. There are no visible headstones, and the area is generally disturbed. There are three slight mounds of sand with a few rocks nearby.

Significance: High

Mitigation: The graves are currently between the School access road and the Izinga fence. They are thus already buffered from the development. These graves have been recorded by the surveyor and occur on the development maps. It would be a good idea to fence off the graves so that they are not disturbed in future vegetation clearance of infratstrucure.

SAHRA Rating: 3A

Appendix B summarises the options for human graves and removals.

TABLE 2: LOCATION AND SIGNIFICANCE OF RECORDED SITES

Site Name	South	East	Significance	Mitigation
2931CA 010	29°42'7.00	31° 4'28.00	Low	None
2931CA 100	29°42'2.00	31° 4'50.00	low	None
UMHLANGA CEMETERY	29°42'7.90	31° 5'4.61	High	Needs accessibility
GRAVES	29°42'28.07"	31° 4'12.26	High	Demarcate

FIG. 12: LOCATION OF RECORDED SITES

FIG. 13: UMHLANGA CEMETERY

FIG. 14: FARM WORKERS' GRAVES

2931CA 010

When Schofield first recorded the site in the 1930s, it appeared to be relatively intact. Thirty years later Davies noted that it was quite disturbed due to farming activity. It is now probably even more disturbed. The site 2931CA 010 was initially too densely vegetated to make a proper assessment. Subsequently, the developer cleared the sugar cane, resulting in excellent ground vision. Fig. 15 shows the site and some of the artefacts.

The site consists of various scatter of Late Iron Age pottery shards, a few upper grinding stones, and individual shell fragments. No decorated pottery was observed. The site does not appear to have an intact cultural horizon, and the artefacts tend to be ephemeral and dispersed across the hill.

Significance: The site is of low significance
Mitigation: A permit for the destruction of the site will be required.
SAHRA Rating: 3C

2931CA 100

2931CA forms part of the Phase 2 project. The site consists of a lag deposit of MSA stone tools. The tools are standard MSA flakes and cores. The sites is not a site per se, but part of the general MSA layer that occurs throughout the area. However, since it is localised on a specific hill it can be viewed as a site.

Significance: The site is of low significance
Mitigation: No further mitigation is required. A permit for the destruction of the site will be required.
SAHRA Rating: 3C.

FIG. 15: SCENIC VIEW & ARTEFACTS AT 2931CA 010






RECOMMENDATIONS

The proposed Izinga housing development was originally surveyed in 2006 by eThembeni. That report noted a Historical Period site in the current Phase 1 area, but did not note two other sites that were previously recorded. 2931CA 100 extends from of Phase 1 to Phase 2. EA has been given for Phase 1. 2931CA 100 needs a permit before it can be destroyed.

2831CA 010 is a site of low archaeological significance and no further mitigation is required. A permit to destroy this site will be required.

The development will allow access to the Umhlanga Cemetery and no further mitigation is required.

The occurrence of graves on the perimeter of the study area needs to be managed. The graves are very difficult to observe due to dense vegetation and natural deterioration, and there are currently no visible headstones. The graves are now between the fence of the development and the road. It would be a good gesture if this area was fenced off sot hat it is not further duisturbed..

CONCLUSION

A heritage survey was undertaken for the proposed Izinga Development Phase 2. The assessment noted that there were previously recorded archaeological sites within the study area. These sites would need to be assessed, as they require permits for their destruction.

One possible Late Iron Age site, 2931CA 010, and a Middle Stone Age site, 2931CA 100, still occurs within the study area. The sites are of low significance and no further mitigation is required. A permit for both sites will be required.

REFERENCES

Ethembeni. 2009. Heritage Impact Assessment Of Izinga Phase 3 Residential Development, Umhlanga, Kwazulu-Natal, South Africa. Report for Sivest.

Maps:

2931CA Verulam 1942, 2000

117B_051_36554

GV 36 F10

GV 36/11

GV 36/F39B

KZN Museum database

SAHRIS Database

Umlando Database

EXPERIENCE OF THE HERITAGE CONSULTANT

Gavin Anderson has a M. Phil (in archaeology and social psychology) degree from the University of Cape Town. Gavin has been working as a professional archaeologist and heritage impact assessor since 1995. He joined the Association of Professional Archaeologists of Southern Africa in 1998 when it was formed. Gavin is rated as a Principle Investigator with expertise status in Rock Art, Stone Age and Iron Age studies. In addition to this, he was worked on both West and East Coast shell middens, Anglo-Boer War sites, and Historical Period sites.

DECLARATION OF INDEPENDENCE

I, Gavin Anderson, declare that I am an independent specialist consultant and have no financial, personal or other interest in the proposed development, nor the developers or any of their subsidiaries, apart from fair remuneration for work performed in the delivery of heritage assessment services. There are no circumstances that compromise the objectivity of my performing such work.

Gavin Anderson
Archaeologist/Heritage Impact Assessor

APPENDIX A

PIA DESKTOP

DESKTOP PALEONTOLOGICAL ASSESSMENT FOR THE PROPOSED IZINGA HOUSING PROJECT, NEAR UMHLANGA, , LOCATED WITHIN THE ETHEKWINI MUNICIPALITY OF THE PROVINCE OF KWA-ZULU NATAL

FOR

UMLANDO: Archaeological Surveys & Heritage Management
PO Box 102532, Meerensee, KwaZulu-Natal 3901
phone (035)7531785 fax: 0865445631
cell: 0836585362 / 0723481327
Email:umlando@gmail.com

by

Dr Alan Smith
Alan Smith Consulting
29 Browns Grove, Sherwood, Durban, 4091, South Africa
Telephone: 031 208 6896
asconsulting@telkomsa.net

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Declaration of Independence

This report has been compiled by Dr Alan Smith (Pr. Sc. Nat.) of Alan Smith Consulting, Durban. The views expressed in this report are entirely those of the author, if not then the source has been duly acknowledged. No other interest was displayed during the decision making process for the Project.

Specialist: Dr Alan Smith

Signature: 

EXECUTIVE SUMMARY

Alan Smith Consulting was appointed by **UMLANDO: Archaeological Surveys & Heritage Management** to conduct a Desk-Top field assessment of the potential impacts to **Palaeontology Resources** that might occur through the activities of the proposed Izinga Phase 2 Residential Development, uMhlanga, eThekwini Municipality, KwaZulu-Natal

Section 38 of the National Resources Act No 25 of 1999 (Heritage Resources Management), requires a Palaeontological Impact Assessment (PIA) to assess any potential impacts to palaeontological heritage.

The chances of encountering fossils is **Low,** but N**ot Zero**; consequently a ***"Chance Find Protocol"*** has been included.

ACRONYMS

BA: Basic Assessment

EDTEA: (Department of) Economic Development, Tourism and Environmental Affairs

HIA: Heritage Impact Assessment

PIA; Palaeontological Impact Assessment

SAHRA: South African Heritage Resource Agency

SAHRIS: South African Heritage Resources Information System

1. BACKGROUND

Tongaat Hullett Developments (THD) (Pty) Ltd received Environmental Authorisation (EA) (DM/0047/07) in September, 2010 to undertake the development of the Izinga Phase 2 Residential Development on Portions 473, 80 and 81 of Farm Lot 31 No. 1560, Rem of Lot A 39 No. 1532, Rem of Lot B 39 No. 1533, Rem of Portions 21, 22, 23, 418, 419, 43 and 441 of Farm Lot 31 No. 1560. The project site is located within uMhlanga, eThekwini Municipality...Izinga Phase 2 development is approximately 193Ha in extent. It is bound by the N2 to the west, Prestondale to the South, Izinga Ridge and the Hawaan Forest Estate to the East and Hawaan Forest to the North (Fig. 1).

The The Izinga Eco Estate will focus on residential dwellings and lifestyle centre and school.

Figure 1: Location map of proposed project (approximate area boxed).

2. TERMS OF REFERENCE

Alan Smith Consulting was requested by **UMLANDO: Archaeological Surveys & Heritage Management** to provide a Desk-Top Palaeo Impact Assessment for the proposed the Izinga Phase 2 Residential Development to assess the likelihood of encountering palaeontological material. The work was to be based on the knowledge gained from desktop review, relevant maps, reviewed literature and personal experience (see Section 11). This report is to meet the requirements of the National Environmental Management Act (Act 107 of 1998) [as amended] Environmental Impact Assessment (EIA) regulations, Appendix 6.

3. SCOPE AND PURPOSE OF REPORT

A Palaeontological Impact Assessment (PIA) is a means of identifying any significant palaeontological material before development begins, so that these can be managed in such a way as to allow the development to proceed (if appropriate) without undue impacts to the fragile heritage of South Africa. This field Desk-Top investigation fulfills the requirements of the heritage authorities (SAHRA), such that a comment can be issued by them for consideration by the competent authority (EDTEA), who will review the Basic Assessment (BA) and grant or refuse authorisation. The PIA report will outline any management and/or mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation, should this be granted.

4. METHODOLOGY

Geological maps, literature review, Alan Smith's published (refereed) research and personal experience were used in this research.

5. GEOLOGY

Sediments of the Umkwelane Formation and rocks of the Vryheid Formation and Pietermaritzburg Formations may be present at this locality (Fig. 3).

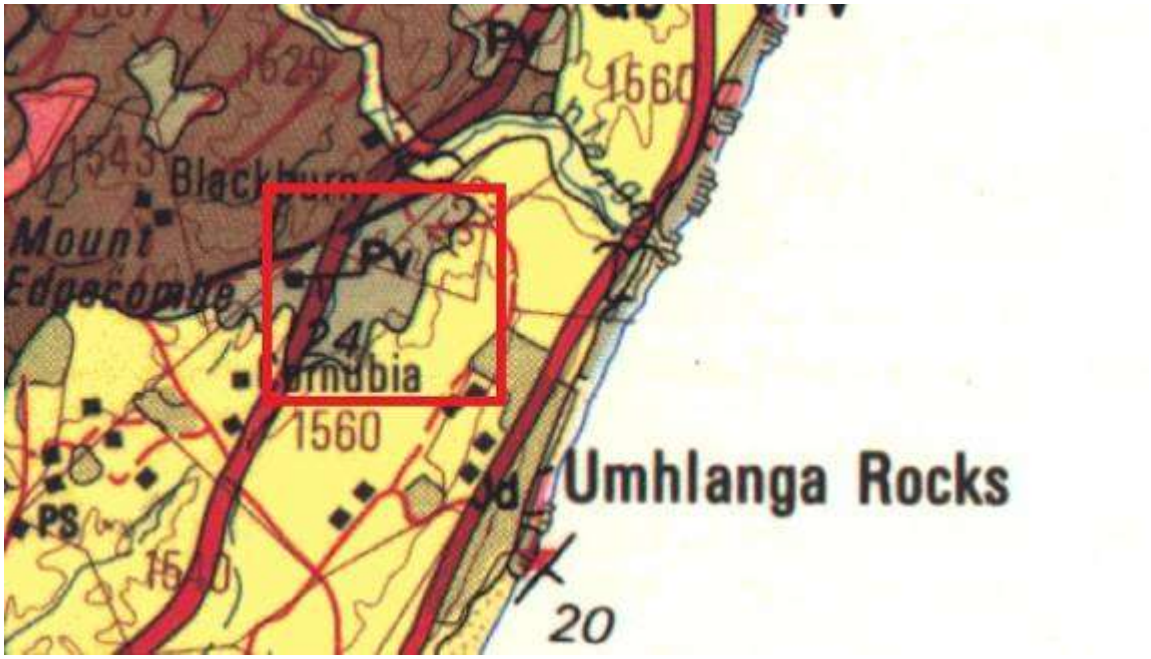

Figure 2: Approximate area of proposed housing development. Extract from the Durban 2930 1:250 000 Geological map. According to this map, the proposed Borrow Pit will intersect Umkwelane Formation (Qb: yellow), Vryheid Formation (Pv: grey) and Pietermiritzburg Formation (brown). Approximate area boxed.

Umkwelane Formation (Berea Red Sand)

This is Mid-Miocene to Pliocene (14 - 4 million years ago (Ma)) in age (Botha, 2018). It is an ancient dune cordon, composed of fossil aeolian (wind-formed) dunes (Fig. 3). The feldspar mineral component has been strongly weathered to give a red clay matrix. This soil is a characteristic red colour (Fig. 3). The top metre of this lithology has been deeply disturbed due to prehistorical, historical and current agricultural practises.

Figure 3: Earthcut north of the proposed development site, showing the characteristic appearance of the Umkwelane Formation (Berea Red Sand).

Vryheid Formation

The Permian aged Vryheid Formation (Kungurian Stage ¬ 260Ma: Green and Smith, 2012) comprises predominantly coarse-grained sandstone (Fig. 4) and siltstones, interbedded by dark shales and coal beds. The Formation is interpreted as deltaic and “near-shore sandbar” deposits within the ancient intracratonic Karoo Sea that existed in this part of Gondwanaland (Johnson et al, 2009). Thin (uneconomic) coal seams are known from the Vryheid Formation in this region (Tavener Smith, 1982; Hastie et al., 2019).

Figure 4: Example of what the Vryheid Formation looks like in outcrop.

Pietermaritzburg Formation

The Pietermaritzburg Formation is very dark blue (when fresh) and crops out as a massive siltstone (Fig. 5). These rocks belong to the Karoo Sequence. The Pietermaritzburg Formation is Lower Permian in age and was deposited within the Karoo Sea in the centre of the Gondwana Supercontinent. This unit was deposited under low energy conditions (Bordy et al., 2017). The Pietermaritzburg Formation deposition followed the Late Paleozoic Glaciation (Dwyka Glaciation) which began at 327 Ma and ended about 260 Ma (Fielding et al., 2008).

Figure 5: Example of what the Pietermaritzburg Formation looks like in outcrop.

6. PALAEONTOLOGY

Umkwelane Formation

Theoretically, there is no reason why fossils should not be found in the Umkwelane Formation, but in practice nothing is found. Although the SAHRIS Map considers this as a **High Palaeosensitivity Zone** (Fig.6), in practice it is a **Low Palaeosensitivity** risk.

Vryheid Formation

The SAHRIS Palaeosensitivity Map (Fig. 6) considers the Vryheid Fm as a **Very High Palaeosensitivity Zone**. In practise, no vertebrate fossils have been recorded from the Vryheid Formation in this area, however invertebrate trace fossils are common (Tavener Smith, 1983; Mason and Christie, 1985; Hastie et al., 2019). Groenewald (2018) pointed out that the aquatic reptile, *Mesosaurus* (earliest known reptile from the Karoo Basin), as well as the fish, *Palaeoniscus capensis*, have been recorded in the Whitehill Formation, occurs within the southern part of the Main Karoo Basin within the Western, Eastern and Northern Cape, but not KwaZulu-Natal (MacRae, 1999). The Whitehill Formation (500 km to the southwest), *may* be a correlative of the Vryheid Formation, however they are not connected. Further, recent research has shown that the lower Vryheid Formation in this area has a different source (Maurice Ewing Bank) to the rest of the Vryheid Formation (Hastie et al., 2019).

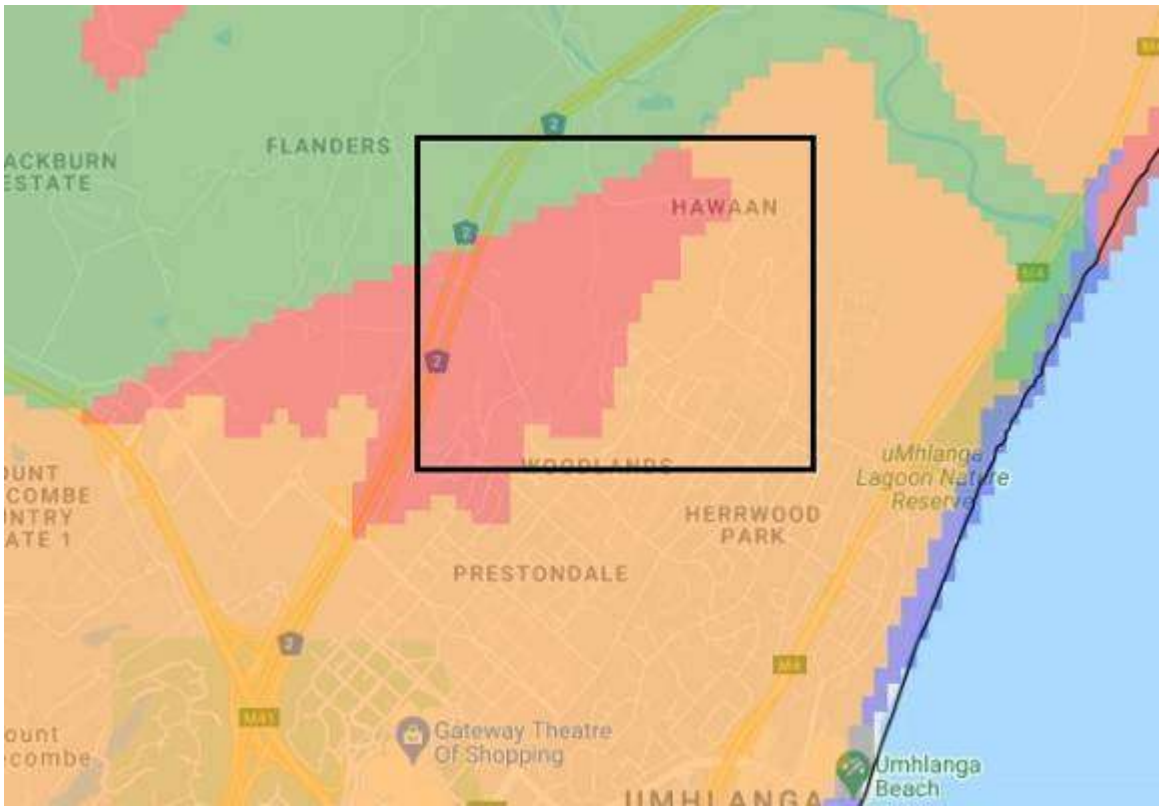

Figure 6: Palaeosensitivity of the Mattioda Borrow Pit site. Extract from Sahris Palaeosensitivity Map. Approximate are boxed. Vryheid Formation (red), Pietermaritzburg Formation (green) and Umkwelane Formation (yellow).

Table 1: Summary of SAHRIS categories

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required

Thin coal seams are known from the Vryheid Formation in this region (Tavener-Smith, 1983; Hastie et al., 2019). Coal comprises compressed plant material and thus constitutes a fossil. Plants such as *glossopteris*, *gangamopteris* and *sigillaria* can be recognized, but these are common.

Pietermaritzburg Formation

The Pietermaritzburg Formation may contain scattered, fragmentary plant fossils and invertebrate trace fossils, all of which may indicate marine conditions (eg. *Helminthopsis*) (Bordy et al., 2017). Potentially it could contain body fossils, but to the writer's knowledge none have been found.

7. SUMMARY

The chance of fossils being found on this site is **Low,** but not **Zero.** A **"Chance Find Protocol"** has been included to cover this eventuality. No further palaeontological work is required, unless triggered by the "**Chance Find Protocol**", which must form part of the Environmental Management Programme (EMPr) for the site

8. CHANCE FIND PROTOCOL

This Chance Find Protocol must be included in the site EMPr.

If any fossils are found, a Palaeontologist must be notified immediately by the ECO and/or EAP and a site visit must be arranged at the earliest possible time with the Palaeontologist.

In the case of the ECO or the Site Manager becoming aware of suspicious looking palaeo-material:

- The construction must be halted in that specific area and the Palaeontologist must be given enough time to reach the site and remove the material before excavation continues.

- Mitigation will involve the attempt to capture all rare fossils and systematic collection of all fossils discovered. This will take place in conjunction with descriptive, diagrammatic and photographic recording of exposures, also involving sediment samples and samples of both representative and unusual sedimentary or biogenic features. The fossils and contextual samples will be processed (sorted, sub-sampled, labeled, and boxed) and documentation consolidated, to create an archive collection from the excavated sites for future researchers.

Functional responsibilities of the Developer

1. At full cost to the project, and guided by the appointed Palaeontological Specialist, ensure that a representative archive of palaeontological samples and other records is assembled to characterize the palaeontological occurrences affected by the excavation operation.

2. Provide field aid, if necessary, in the supply of materials, labour and machinery to excavate, load and transport sampled material from the excavation areas to the sorting areas, removal of overburden if necessary, and the return of discarded material to the disposal areas.

3. Facilitate systematic recording of the stratigraphic and palaeo-environmental features in exposures in the fossil-bearing excavations, by described and measured geological sections, and by providing aid in the surveying of positions where significant fossils are found.

4. Provide safe storage for fossil material found routinely during excavation operations by construction personnel. In this context, isolated fossil finds in disturbed material qualify as “normal” fossil finds.

5. Provide covered, dry storage for samples and facilities for a work area for sorting, labeling and boxing/bagging samples.

6. Costs of basic curation and storage until collected. Documentary record of palaeontological occurrences must be done.

7. The contractor will, in collaboration with the Palaeontologist, make the excavation plan available to the appointed specialist, in which appropriate information regarding plans for excavations and work schedules must be indicated on the plan of the excavation sites. This must be done in conjunction with the appointed specialist.

8. Initially, all known specific palaeontological information will be indicated on the plan. This will be updated throughout the excavation period.

9. Locations of samples and measured sections are to be pegged, and routinely and accurately surveyed. Sample locations, measured sections, etc.,

must be recorded three-dimensionally if any “significant fossils” are recorded during the time of excavation.

9, CONCLUSIONS

This project will be constructed within an area underlain by the Umkwelene Formation, Vryheid Formation and Pietermaritzburg Formation. Although paleontological material is unlikely to be encountered in the soil, a “Chance Find Protocol” has been included. No further **palaeontological work** is required unless the “Chance Find Protocol” is triggered.

10. REFERENCES

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Volume 32, Issues 1–2, May 1982, Pages 111-14

11. DETAILS OF SPECIALIST

Dr Alan Smith

Private Consultant: ***Alan Smith Consulting, 29 Brown's Grove, Sherwood, Durban, 4091***

&

Honorary Research Fellow: ***Discipline of Geology, School of Agriculture, Earth and Environmental Sciences, University of KwaZulu-Natal, Durban***.

Role: Specialist Palaeontological Report production

Expertise of the specialist:

- PhD in Geology (University of KwaZulu-Natal), Pr. Sc. Nat., I.A.H.S.
- Expert in Vryheid Formation (Ecca Group) in northern KZN, this having been the subject of PhD.
- Scientific Research experience includes: Fluvial geomorphology, palaeoflood hydrology, Cretaceous deposits.
- Experience includes understanding Earth Surface Processes in both fluvial and coastal environments (modern & ancient).
- Alan has published in both national and international, peer-reviewed journals. He has published + 50 journal articles with 497 citations (detailed CV available on request).
- Attended and presented scientific papers and posters at numerous international and local conferences (UK, Canada, South Africa) and is actively involved in research.

Selected recent palaeo-related work includes:

- Desktop PIA: Proposed middle income housing units on Portion 23 of Farm Lot H Weston 13026, Bruntville, Mpofana Local Municipality. Client: UMLANDO.
- Desktop PIA: Proposed ByPass Pipeline for Ulundi bulk water pipeline upgrade. Client: UMLANDO.
- Fieldwork PIA: Bhekuzulu Epangweni KZN water reticulation project, Cathkin Park. Client: Mike Webster, HSG Attorneys.
- Fieldwork PIA: Mpungoze water supply scheme, Empangeni. Client: Enviropro.
- Fieldwork PIA: Helpmekaar Dam. Client: Afzelia environmental consultants.
- Desktop PIA: Zuka valley, Ballito. Client: Mike Webster, HSG Attorneys.
- Mevamhlope proposed quarry palaeontology report. Client: Enviropro.
- Desktop PIA: Proposed Lovu Desalination site. Client: eThembeni Cultural Heritage.
- Desktop PIA: Tinley Manor phase 2 North & South banks: eThembeni Cultural Heritage
- Desktop PIA: Tongaat. Client: eThembeni Cultural Heritage.
- Palaeontological Assessment Reports (3) to Scatec Solar SA (Pty) Ltd on an Appraisal of Inferred Palaeontological Sensitivity for a Potential Photo Voltaic Park at (1) Farm Rooilyf near Groblershoop, N Cape; (2) Farm Riet Fountain No. Portions 1 and 6, 18km SE of De Aar, N Cape; and (3) Dreunberg, near Burgersdorp, Eastern Cape. Client: Sustainable Development Projects.

APPENDIX B

SUMMARY OF HUMAN GRAVE RELOCATIONS

GRAVES

The developer must follow the guidelines mentioned below otherwise the project may be brought to halt.

The process of grave removals is a complex one that requires community consultation, advertisements, several permits, and finally reburial. Moreover, those graves older than 60 years require a qualified archaeologists to undertake the entire process. This process is summarised as follows[1]:

In terms of the National Heritage Resources Act (No. 25 of 1999), and KZN Amafa and Research Institute Act 5 of 2018, graves older than 60 years (not in a municipal graveyard) are protected. Human remains younger than 60 years should be handled only by a registered undertaker or an institution declared under the Human Tissues Act. Anyone who wishes to develop an area where there are graves older than 60 years is required to follow the process described in the legislation (section 36 and associated regulations). The specialist will require a permit from the heritage resources authority:

- Determine/ confirm the presence of the graves on the property. Normally the quickest way to proceed is to obtain the service of a professional archaeologist accredited to undertake burial relocations. The archaeologist will provide an estimate of the age of the graves. There may be a need for archival research and possibly test excavations (permit required).
- The preferred decision is to move the development so that the graves may remain undisturbed. If this is done, the developer must satisfy SAHRA/KZN Heritage that adequate arrangements have been made to protect the graves on site from the impact of the development. This usually involves fencing the grave(yard) and setting up a small site management plan indicating who will be responsible for maintaining the graves and how this is legally tied into the development. It is recommended that a distance of 10-20 m is left undisturbed between the grave and the fence around the graves.
- If the developer wishes to relocate or disturb the graves:

[1] Information supplied by SAHRA, and it applies to KZN, although falling under the KZN Heritage Act.

- A 60-day public participation (social consultation) process as required by section 36 (and regulations - see attachment), must be undertaken to identify any direct descendants of those buried on the property. This allows for a period of consultation with any family members or community to ascertain what their wishes are for the burials. It involves notices to the public on site and through representative media. This may be done by the archaeologist, who can explain the process, but for large or sensitive sites a social consultant should be employed. Archaeologists often work with undertakers, who rebury the human remains.
- If as a result of the public participation, the family (where descendants are identified) or the community agree to the relocation process then the graves may be relocated.
- The archaeologist must submit a permit application to SAHRA/KZN Heritage for the disinterment of the burials. This must include written approval of the descendants or, if there has not been success in identifying direct descendants, written documentation of the social consultation process, which must indicate to SAHRA's satisfaction, the efforts that have been made to locate them. It must also include details of the exhumation process and the place to which the burials are to be relocated. (There are regulations regarding creating new cemeteries and so this usually means that relocation must be to an established communal rural or formal municipal cemetery.)
- Permission must be obtained before exhumation takes place from the landowner where the graves are located, and from the owners/managers of the graveyard to which the remains will be relocated.
- Other relevant legislation must be complied with, including the Human Tissues Act (National Department of Health) and any ordinances of the Provincial Department of Health). The archaeologist can usually advises about this.

To remove a human grave from an archaeological site requires a permit from KZAN Amafa. This will only be given to a qualified archaeologist who has experience in removing human remains. These sites tend to be older than 100 years and there are few direct claims to the remains. Direct claims tend to occur to with known historical people

only. However, communities may claim ancestral remains in general if the remains are to be removed. These claims will need to be lodged with Amafa KZN.