

**HIA FOR THE PROPOSED UMNINI RURAL
HOUSING PROJECT, KZN**

**FOR DELTA BUILT ENVIRONMENT
CONSULTANTS (PTY) LTD**

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Abbreviations

EIA	Early Iron Age
ESA	Early Stone Age
HIA	Heritage Impact Assessment
HP	Historical Period
IIA	Indeterminate Iron Age
ISA	Indeterminate Stone Age
KZNARI	KwaZulu-Natal Amafa & Research Institute
LIA	Late Iron Age
LSA	Late Stone Age
MSA	Middle Stone Age
PIA	Palaeontological Impact Assessment
SAHRA	South African Heritage Resources Agency

INTRODUCTION

“The KZN Department of Human Settlement proposes a Rural Housing Project for the Umnini Traditional Authority area in the South Local Operational Entity of eThekweni Municipality. Delta Built Environment Consultant has been appointed by The Department of Human Settlements to undertaking all Planning related works and Township Establishment for the Umnini Rural Housing Project.

The environmental sub-services are required for the proposed project as per the contract include:

- Acquiring Environmental Authorisation via the Scoping & EIA process from the National Department of Forestry, Fisheries, and the Environment (DFFE).
- Acquiring a Water Use Licence from the Department of Water and Sanitation (DWS).

Umnini is located within the rural area of eThekweni Municipality approximately 35 km south of the eThekweni CBD, along the southern coastal area of Ward 98. The study area is bordered by the Msimbazi River to the north, and the Umkomazi River to the south, which is outside the development area boundary. Within the development area, there is the Ngane River and the Mgababa River. All the rivers deposit to the east of the development area, which is the Indian Ocean. On the western boundary is the eThekweni municipal boundary.

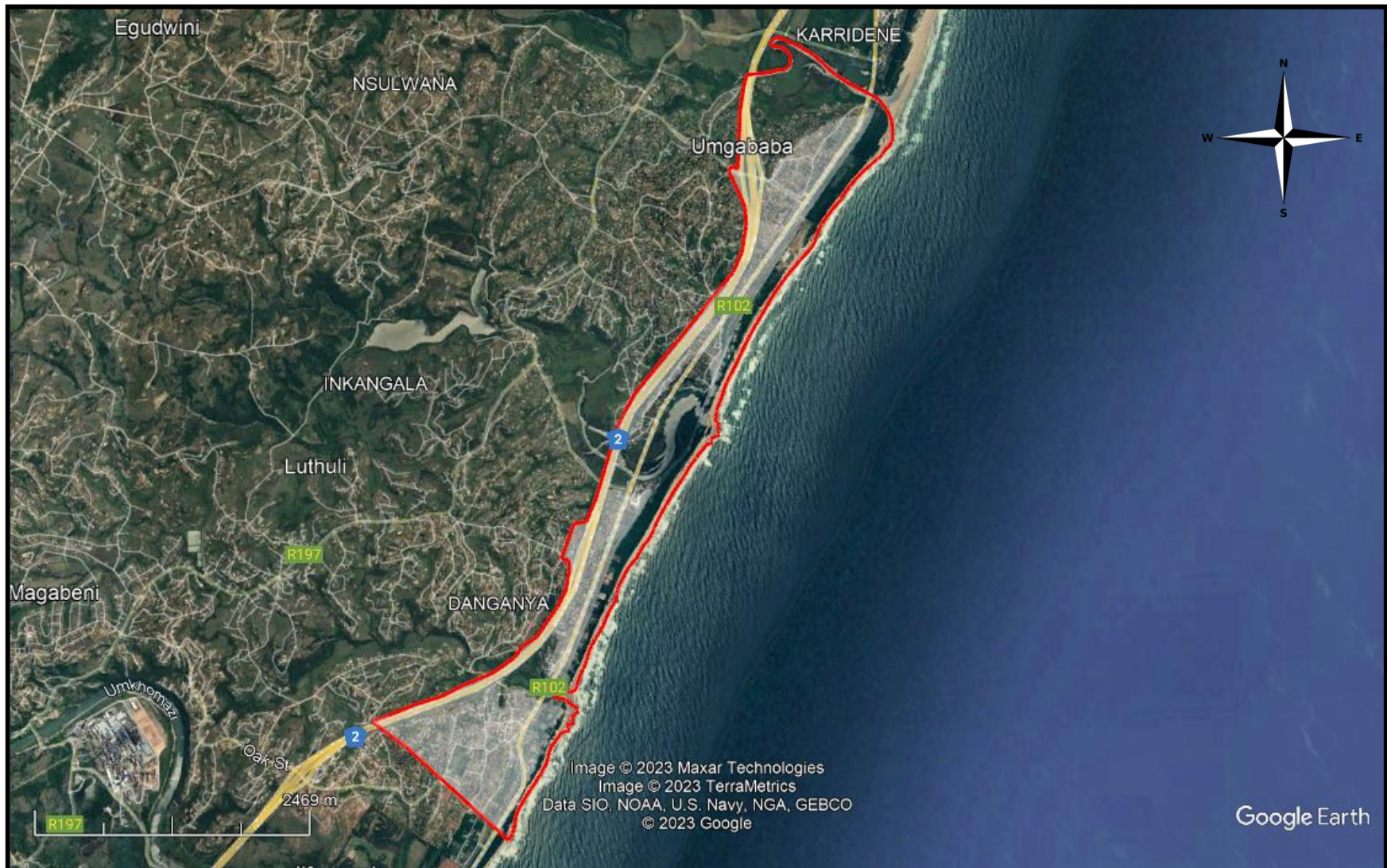
The existing development of the study area is typical of most peripheral rural areas of the metro under traditional tenure, and it is approximately 575 ha in total extent” (Delta BCS 2023)

Umlando was requested to undertake the Phase 1 HIA of the proposed development in terms of a feasibility report. Figures 1 – 4 show the location of the development.

FIG. 1 GENERAL LOCATION OF THE PROPOSED DEVELOPMENT

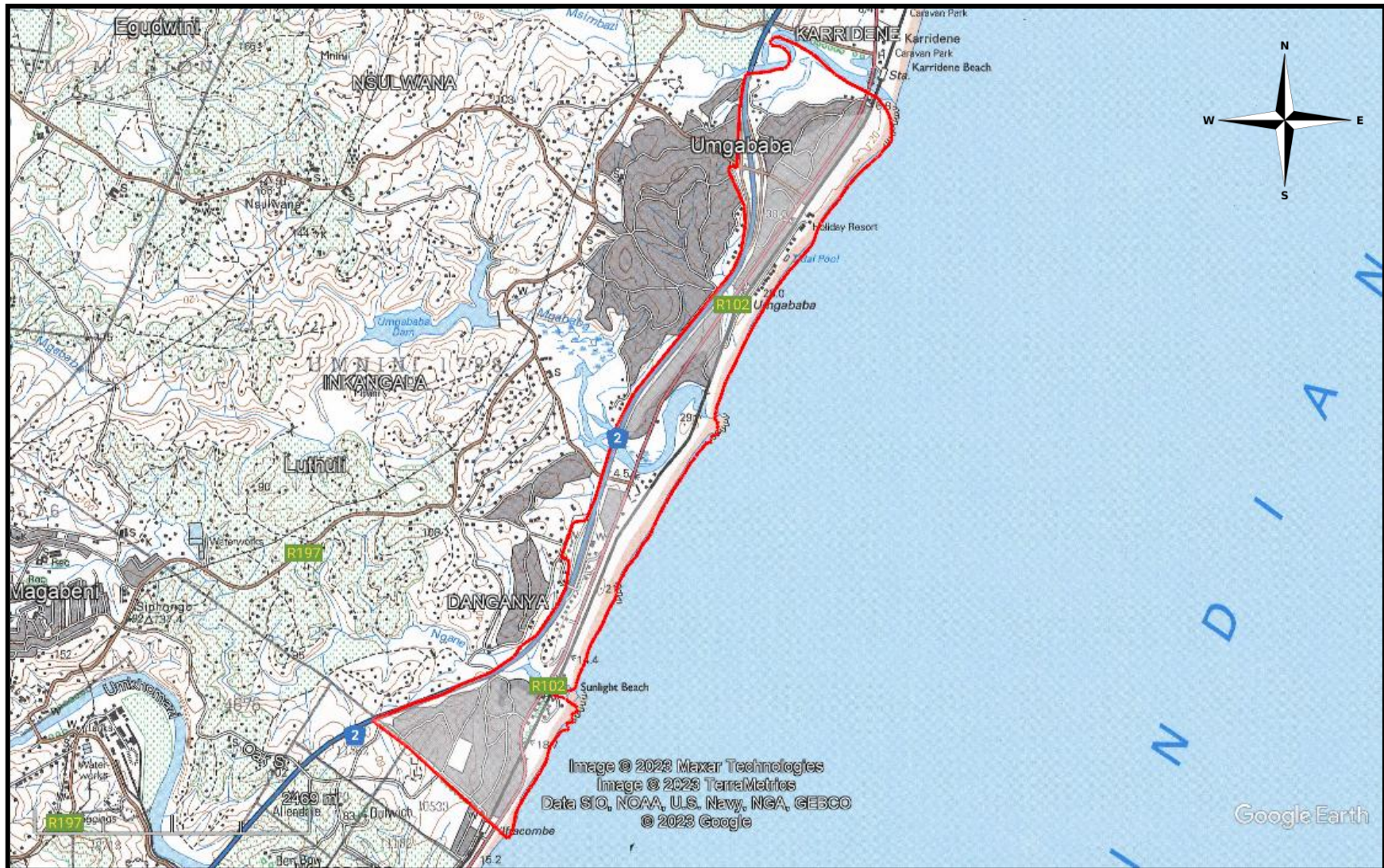


FIG. 2: AERIAL OVERVIEW OF THE PROPOSED DEVELOPMENT¹



¹ Shaded white area will be upgraded.

FIG. 3: TOPOGRAPHICAL MAP OF THE PROPOSED DEVELOPMENT²



² 3030BB Umgababa 1993

FIG. 4: SCENIC VIEWS OF THE STUDY AREA



KWAZULU NATAL AMAFA AND RESEARCH INSTITUTE, ACT 05, 2018,

The KwaZulu Natal Amafa And Research Institute, Act 05, 2018, Chapter 8 (pp 29 – 32) defines heritage resources.

“General protection: Structures.

37.(1)(a) 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 Institute having been obtained on written application to the Council.

(b) Where the Institute does not grant approval, the Institute must consider special protection in terms of sections 38, 39, 40, 41 and 43 of Chapter 9.

The Institute may, by notice in the *Gazette*, exempt—

(a) A defined geographical area; or

(b) defined categories of sites within a defined geographical area, from the provisions of subsection where the Institute 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.

(3) 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.

38. No person may damage, alter, exhume, or remove from its original position

(a) the grave of a victim of conflict;

(b) a cemetery made up of such graves; or

(c) any part of a cemetery containing such graves, without the prior written approval of the Institute having been obtained on written application to the Council.

General protection: Informal and private burial grounds

39.(1) or burial ground older than 60 years, or deemed to be of heritage significance by a heritage authority -

(a) not otherwise protected by this Act; and

(b) 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 Institute having been obtained on written application to the Council.

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

(a) the applicant has made a concerted effort to consult with communities and individuals who by tradition may have an interest in the grave; and

(b) 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.—

40 (1) 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 Institute having been obtained on written application to the Council.

(2) 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 Institute without delay.

(3) The Institute 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 Institute to be inappropriate within 50 metres of a rock art site.

(4) 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 Institute having been obtained on written application to the Council.

(5) 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 Institute having been obtained on written application to the Council.

(6)(a) 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, vests in the Provincial Government and the Institute is regarded as the custodian on behalf of the Provincial Government.

(b) The Institute may establish and maintain a provincial repository or repositories for the safekeeping or display of —

- (i) archaeological objects;
- (ii) palaeontological material;
- (iii) ecofacts;
- (iv) objects related to battlefield sites;
- (v) material cultural artefacts; or
- (vi) meteorites,

(7) The Institute may, subject to such conditions as the Institute may determine, loan any object or material referred to in subsection (6) to a national or provincial museum or institution.

(8) No person may, without the prior written approval of the Institute having been obtained on written application to the Institute, trade in, export or attempt to export from the Province ~

{a} any category of archaeological object;

{b} any palaeontological material;

{c} any ecofact;

{d} any object which may reasonably be regarded as having been recovered from a battlefield site;

{e} any material cultural artefact; or

{f} any meteorite.

(9){a} A person or institution in possession of an object or material, referred to in paragraphs (a) ~ (f) of subsection (8), must submit full particulars of such object or material, including such information as may be prescribed, to the Institute.

{b} An object or material referred to in paragraph (a) must, subject to paragraph (c) and the directives of the Institute, remain under the control of the person or institution submitting the particulars thereof.

{c} The ownership of any object or material referred to in paragraph (a) vests in the Provincial Government and the Institute 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 database 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:

- State of preservation of:
- Organic remains:
 - Faunal

- Botanical
- Rock art
- Walling
- Presence of a cultural deposit
- Features:
 - Ash Features
 - Graves
 - Middens
 - Cattle byres
 - Bedding and ash complexes
 - Spatial arrangements:
 - Internal housing arrangements
 - Intra-site settlement patterns
 - Inter-site settlement patterns
- Features of the site:
 - Are there any unusual, unique or rare artefacts or images at the site?
 - Is it a type site?
 - Does the site have a very good example of a specific time period, feature, or artefact?
 - Research:
 - Providing information on current research projects
 - Salvaging information for potential future research projects
 - Inter- and intra-site variability
 - Can this particular site yield information regarding intra-site variability, i.e. spatial relationships between various features and artefacts?
 - Can this particular site yield information about a community's social relationships within itself, or between other communities?
- Archaeological Experience:
 - 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.

- Educational:
 - Does the site have the potential to be used as an educational instrument?
 - Does the site have the potential to become a tourist attraction?
 - The educational value of a site can only be fully determined after initial test-pit excavations and/or full excavations.
- Other Heritage Significance:
 - Palaeontological sites
 - Historical buildings
 - Battlefields and general Anglo-Zulu and Anglo-Boer sites
 - Graves and/or community cemeteries
 - Living Heritage Sites
 - 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	Grade 3A / 3B	

Significance		
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. There are no known heritage surveys near the study area.

The general area is known for its high number of archaeological sites (fig. 5). These archaeological sites were recorded by Dart in the 1930s, Schoute-Vanneck & Walsh surveys in the 1950s and 1960s and Davies 1950s and 1960s surveys. These form part of the KZN Museum database. Twenty-six sites occur within the study area of which eleven occur in the environmental buffer. Fifteen of the sites have been destroyed/damaged by housing, roads and related infrastructure. I quote the site record forms from the KZN to show that the damaged sites have been extensively sampled and thus an adequate artefact record exists. The site records also discuss the geology of the area and extensive mine excavations. All spelling and wording is as occurs on the site record form. Some terms are archaic and/or have changed over time, especially shell species' names.

3030BB 002

"The large limonite excavated area is just on west? side of N2, 3/4 mile north of Umgababa station.

It was a very large excavation, and great quantities of red sand were removed for treatment, leaving a more or less bare sandy area nearly 1/2 mile long. The excavation was in the main red dune, which rose both from east and from west; on west of it was a trough behind which the ground rises to higher marine terraces. The dune was of very varying height, and the stratified layers in it varied greatly in thickness, and towards edge of the dune tended to telescope. Only part of the high dome survived after the mining closed, which was too hard and unsuitable for treatment; most of the description related to what can be seen in that fragment.

Rock is not exposed.

The floor of the diggings in a hard, bright red illuvial sand with many chips of stone and artefacts (NM 73/19); a good deal of grit. The sand is fairly fine and may be partly aeolian or reworked aeolian. In one place there are many ilmenite nodules in it, and similar nodules were found farther to south at base of the red dune by Frankel, on the descent to Umgababa Lagoon. Thickness unknown; surface of the illuvial sand is not level, but I do not know if the underlying rock also is uneven, nor if some of the illuvial sand was mined.

The basal illuvial sand grades into a bright red aeolianite without any stones or unconformity. McCarthy gives its thickness as >20', which would be in the surviving fragment.

About 1" above the top of the lower red aeolianite was a land-surface. The surface was calcified, and nodules and root-tubes of sandy calcification extend a short way into the red sand. The top 2' of the red sand is humified and is red-brown. On the calcified surface, in a small patch where exposed, were many land-snails, and bone etc.. Sangoan material (NM 73/20) on base of calcified sand. The snails occur down through the humified zone, but not into the pure red sand.

On the land-surface is a whitish calcified dune, given by Mc Carthy as 50-60' thick (at the surviving dome). The sand is false-bedded in places, and is full of concretions, mostly spherical, some flat and a few pipe. Towards the east edge of the diggings is a small pillar surviving, with quite thin lower red sand, white sand only about 3' thick, and

upper red sand on it.

On the whitish sand is a layer of ferricrete nodules with many artefacts (NM 73/21). Above this is a softer red sand of unknown thickness, in the central dome entirely removed, visible at edge of diggings.

The upper red sand passed without unconformity into a grey surface-layer of sandy soil. Near the surface were shell-middens (NM 73/22); and there may have been surfaces in it. The humic surface-layer was 1-2m thick.

CONTENT:

73/18. Unstratified material found on floor of the diggings; in Natal Museum 2 quartzite picks and 1 quartz side-scraper. There is quite a lot of unstratified material lying about. Davies added later: Found well away from the stratified surviving section, Dr Hobday collected for Geology Dept, UN PMB, 2 large shale hand-axes (late Acheulian) and 1 pick on a quartzite pebble (Sangoan).

73/19: From basal illuvial red sand, in NM 3 shale and 1 sandstone hand-axe, 1 shale and 2 quartzite choppers, 1 ?porcellanite ?fabricator. There are many chips of shale and porcellanite in this sand.

73/20: From in base of white sand, on land-surface; or found loose below but from colour identified as from this layer. In NM 3 pebble-picks and 3 flakes, probably Sangoan. One of the picks, though not found in situ, is bright red on one face and whitish on the other and must come from this surface. Walsh saw in the manager's office some Sangoan pieces, not stained red and almost certainly from this surface. Fragments of bone, McCarthy records bones of buck. ...

73/21 from ferricrete nodules at top of white sand and base of upper red: 2 trimmed uniface MSA points; 2 large pebble-choppers (not picks of Sangoan type); 4 blades, 2 flakes, one with faceted butt; 1 broken chip.

73/22: From near surface, found fallen and unstratified: 1 dolerite grindstone of Bushman type. The middens formerly seen near surface have now been destroyed.

Further collections - January 1980.

From in base of white sand: 73/20: Quartzite pebbles, 2 picks (one 10" long), end-chopper, side-scraper, fine sandstone ?Ecca pick, rough flake (?hollow-scraper).

From ferricrete nodules and base of upper red: 73/21: quartzite: 1 flake; silt or fine sand-stone: 3 flakes, 1 disc-core; ?dolerite: 1 end-scraper; several pieces which must have been brought but show no signs of work (discarded).

From basal illuvial red sand: 73/19: shale: 3 hand-axes 1 large, 1 cleaver; dolerite: 1 hand-axe; shale broken disc; dolerite: ?end-scraper.

Unstratified: 73/18: most likely look Pietersburg one or two may be Tugela; 1 small pick. 2 side-scrapers; 2 cores, 5 flakes."

The site was damaged and destroyed by mining and residential buildings and infrastructure.

Significance: The site was of medium significance.

Mitigation: No further mitigation required.

SAHRA Rating: 3B

3030BB 016

Schoute-Vanneck & Walsh apparently use this location as a type for middens of which there are several in the same type of position along the coast between Karridene and Umgababa.

The 20' middens are on surface and into compacted grey soil beneath recent wind-blown sand on the first line of dunes behind the beach.

Content at type site: mussel shells, a very few broken sandstone pebbles about 5" across, a little pottery with coarse grit-inclusions, fairly well baked black to light brown,

rounded and everted rims, interior even and matt, exterior seems a bit sand-blasted.

The 10' middens are on the storm-beach. They are small, 6-9' across, about 1" thick.

Content: Fresh mussels, a few sherds similar to those on the 20' midden, no charcoal, few small thin lydianite pebbles. (Schoute-Vanneck & Walsh).

Davies comments: These middens seem separate from the well-known stone-age sites south of the Msimbazi mouth, recorded under 3030BB 060 (NM 48/16) and 3030BB 058 and 059 (NM 50/225). These sites are not recorded by Schoute-Vanneck & Walsh, and seem to have been completely destroyed by N2 and associated work before their survey in 1958.

From the 20' middens however may well have come the pottery collected by French (In NM 30/233). There is however no record on which bank of the river his site was.

The second line of dunes is composed of compacted yellow-red sand overlain by recent wind-blown sand. The stone-age sites (3030BB 058-060) seem to have been in these.

The site is an Early Iron Age shell midden that occurs on the first beach dune cordon. It will not be affected by the development

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 017

"Sites A, B in a deep trench about 200 yards from the beach behind the sub-station. C is higher up the slope above the shore-works for ilmenite.

A, B: In a trench 2 shell-layers about 1 1/2' apart.

A is in clean sand, and it is possible that the shells are not human deposit but a storm deposit from the beach-rocks.

Content: Entirely Perna, a good many articulated and shut; hardly compacted. No artefacts or charcoal.

B in above A in the trench. Exposure about 100' long and 1' thick.

Content: Perna, slightly compacted, shells mostly whole, a few cowries up to 1 1/2" long, charcoal and charcoal dust, broken pebbles, small flat ovoid pebbles, plain potsherds (NM 89/74).

C is in yellow-red sand and perhaps older than B. Exposure about 50' long and 1' thick.

Content: split pebbles up to 6", small pebbles of beach-rock, sherds with coarse grits.

These sites are in the environmental buffer and will not be affected.

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 018

"Schoute-Vanneck & Walsh's site: The LSA exposure was about 30' across. On the seaward side was probably a quartz factory-site, as there were many quartz chips over an area about 15 x 10'; this part faces the lagoon.

There was pottery on the exposure. This seemed derived from a higher level, and Walsh remembered an NC3 occupation about 3' above the Wilton, which by 1960 had disappeared save for sherds which had sunk.

1 sq metre was excavated and sieved, and tests were dug at other points on the exposure. They yielded little, and nearly everything came from on or near the surface of the exposure.

Authors consider that the culture, while it has Wilton elements, is nearest akin to Smithfield P.

The stratification of the dune is: brown humic soil; at its base the main midden, on surface of layer below; old yellow sand; consolidated red dune, MSA (?any pieces found here).

CONTENT: IN LSA level: very much ochre; much coarsely flaked lydianite; flat ovoid and round lydianite pebbles; round quartzite pebbles; anvils and hammer-stones, including anvil with 3 dimples up to 1cm deep and about 4cm apart, dimples 2cm across at base, sandstone.

Smithfield-type tools bruised rather than trimmed, including end-scraper.

In situ is shell-layer quartz and jasper chips; ovoid pebbles; ovoid pieces of lydianite and quartzite, some used as hammers and grinders, one ground at both ends. Mostly mussel, a few Patella and Turbo coronatus.

In the area of quartz chips, also flakes of lydianite and tillite, ovoid anvils; ovoid hammers bruised at both ends; bone point with striae; trimmed lydianite scrapers; partly finished kwe [bored stone] broken in manufacture; broken perforated disc of soft shale; a few animal and fish bones; tusk of warthog.

The pottery (probably derived) is of NC3 type with coarse quartz grits. Nearby, but not actually in the midden were splaying rims with diagonal grooving. Several pieces of one pot were found together. One sherd was near a human femur. This pottery must associate with the site on N2 4/40/44 [JHB - Durban Road Works] and probably Durban [Mus Acc. No] 4375, which is also NC3.

Swan sent to JHB (4/40/32): 4 fair-sized chipped pebbles; 1 very thin flaked uniface ovoid pebble; 1 polished palette, 1 broken bone; 3 small beads probably of shell; sherds

with diagonal or criss-cross incisions [sherds now in Natal Museum NM 90/20]; 1 unfinished stone armring.

Davies 1951 excavation: The habitation-earth had been almost entirely eroded by 1951, when I carried out a small excavation there.

This midden may have been continuous with Swan's site [JHB] 4/40/32, which seems to have lain between the point and the Wilton site on south bank on N2 [JHB] 4/40/49. The spread apparently reached to N2, and is recorded as the upper layer above the Wilton level on N2; but probably nothing was found at this level so far inland. Davies added later: probably Schoute-Vanneck & Walsh site.

Material found and excavated by Davies and accessioned in Natal Museum 48/26:

1 pebble slightly pounded; 3 pebbles faceted by grinding; 5 broken pebbles; 10 uniface pebble-choppers; 4 biface pebble-choppers; 4 broken discs; 3 perforated broken discs; 1 broken bun-grindstone; 2 small fabricators; 1 side-scraper; 1 point; 2 small quartz artefacts?; 6 chips and flakes; 3 high and discoidal cores, 3 sherds.

Save where otherwise stated, material seems to be entirely medium-sized well-rolled pebbles apparently of dolerite or lydianite.

Davies added: Near but not on the site was a large stone slab with 3 cup marks.”

The site is in the environmental buffer and will not be affected.

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 019

“In first line of dunes. Small exposure: mussels, a few limpets; few lydianite pebbles, no microflakes, broken pieces of quartzite and sandstone; sherds of NC2 texture in situ.”

The site is in the environmental buffer and will not be affected.

Significance: The site appears to be of low significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 020

“Shell-layer, exposed 10' long and 10" thick, shells are in very poor condition, disintegrated and very comminuted and easily crushed to a powder. They weather to form a solid calcareous tufa.

Content: Mainly mussel, some shells charred, many *Patella granularis* and oysters, especially concentrated at base of layer. Ovoid pebbles of quartzite lydianite and beach-rock, average 1 1/2 x 1 x 1/2", small lydianite waste flakes rare; carbon throughout deposit; few broken stones or flakes from large pebbles. A very few very coarse sherds.”

The site is in the environmental buffer and will not be affected.

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 021

“In first line of dune behind the beach.

Exposure 4' long and 2" thick. Mussels, otherwise sterile.”

The site is in the environmental buffer and will not be affected.

Significance: The site is of low significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 022

“The exposure is 18' long and consists of 2 layers of shells separated by 2" of sterile sand. Each layer is about 3" thick. Both seem to belong to the same culture-complex.

Lower layer: Mussels, a fair number of *Patella granularis*; 1 sherd in situ, reddish baked to brown and black 1/2" thick; a few lydianite flakes and small lydianite pebbles, 1 large flake struck from cortex; no carbon.

Upper layer: Mostly mussel, many shells burnt; much fine carbon in sand; many oysters; 1 ovoid stone 6 x 4 x 2 1/2"; many pieces of micaceous sandstone.”

The site is in the environmental buffer and will not be affected.

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 024

“Among dunes at about 50' S.L.. Near an outcrop of indurated shale. There are remains of a former marine platform at about 20' S.L.

Content: some oysters, a few mussels; nondescript broken stone, thin round pebbles 3/4-1" across; NC3 sherds with large quartz grits, rims rounded, on necks diagonal and cross-hatched bold incisions, some square rims [NM 89/75].

NM 89/22: 3 pieces decorated pot, appears to have come from a vessel with a straight to inward sloping neck, crosshatched decoration at body/neck junction.”

The site is an Early Iron Age shell midden that occurs on the first beach dune cordon. It will not be affected by the development

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B

3030BB 025

“Site found by Swan and described by him and Walsh, now destroyed. This is recorded as 27.75 miles south of Durban (probably on the old railway milepost; now changed). It was a borrow-pit just north of the bridge of N2 over the railway (built after Swan first saw the site) and just east of the railway. It was in brown blown sand, and occurred particularly on the west side of the pit near the railway.

Composite section given by Schout-Vanneck of several sites close to the railway bridge:

6" windblown sand; then 8' blackbrown sand merging into brown-yellow sand; at 12" depth from its surface Bantu pottery (NM 50/239, LIA); then at 5' depth from surface Wilton in blue chalcedony; then at 7'6" depth broken quartz chips; then 3' of hard yellow sand over consolidated red sand, at a little depth in it Sangoan (NM 50/239).

This appears to be the main Wilton site, use in the publication by Walsh & Swan. Swan's material, found at 2 1/2' depth (more) in JHB 4/40/45. 2 thumbnails, one of quartz and one of chert; rounded scraper, awl, microblade; quartz crescent; chert borer; chert backed blade; hollow scraper; chips of Wilton type. Flaked pebbles. Anvil-stone; bored

stone; grinder; pebble rubbed on several faces.

Malan records several perforated discs, some with ground perforation. I identified in Johannesburg, one of these roughly chipped round edge, with chipped but not polished perforation; another is probably a piece I called a stone lid; I also identified a slate arm-ring.

Scrapers which I call of Smithfield A type; uniface point of MSA type, ?from a lower level in the red sand.

Another collection from this site was sent by Swan to JHB 31/8/1952; 3 small tanged arrowheads; end-scrapers; backed microliths; rubbing-stone; disc-rings in several stages of manufacture. And in September 1953: 3 disc-fragments, 1 end-scraper of white chert; 2 blades.

I had one group labeled 50/239a. This was probably not far from 50/239, but may have been this site here. I am not certain what this group contained, it probably all went to Dept of Archaeology, University of Ghana, and may well have been a poor Wilton assemblage. [Ward, Oct 2004. Part of 50/239 is in Natal Museum, National Site number 3030BB 073: strangulated scraper, 3 flaked pebbles, 1 sherd]. I also have a record of a rough biface hand-axe. This also may have gone to Ghana, as I cannot trace it, and it may be the only piece extant from the level which Walsh claims as Sangoan. Davies added later: In a bank 10' north of the Wilton occurrence was a broken arm-ring, now in possession of Mrs Meintjes."

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of medium significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3B

3030BB 026

“According to the composite diagram of stratification, reproduced in 3030BB 025, this site lay at a lower level than the other, 6" above base of brown yellow sand where it overlay hard consolidated red sand.

Content: small smashed chips of clear and milky quartz.

Probably from this site in September 1953 Swan sent to Arch. Survey, JHB 3 rubbers and a small core. Apparently from this area nothing else.

Added later: 2 grindstones in possession of Mrs Meintjes.”

The site would occur on the edge of the development, but no longer exists.

Significance: The site is of low significance.

Mitigation: No mitigation required

SAHRA Rating: 3C

3030BB 027

“Length of exposure 30'.

Fairly fresh and hard mussel-shells with colour; oysters; lydianite pebbles (which are common along this shore), fragments of disintegrated shale; sherds of NC3 texture, black and baked red, matt surface, outer surface sandy; reddish and brownish inclusions in the paste like clay.”

The site is on the first dune cordon and will not be affected

Significance: The site is of low-medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

SAHRA Rating: 3B (for now)

3030BB 058

“Where the road rises on right back of the Mzimbazi lagoon, there appeared in 1950 beneath several feet of grey sand and about 4' of red sand a layer of pebbles with flakes. This line dipped towards the lagoon, and apparently ended in contact with a deposit about 20' above it (? Paudorf transgression, cp. the site at Kelso 3030BC 052). This deposit was a horizontal layer of dark grey sand, which may have been laid down in the lagoon at this height.

Added later: R.C. Walsh said (?accurately) that the red dune at Karridene (?on which bank) rested on a 25' rock-bench.

Swan's MSA layer in the railway cutting was at 10-15' below surface, rising to the surface as the river-bank sloped down.

Added later: 4/40/28. Industry of MSA type, fairly advanced: flattish picks, points, backed blades, fair-sized crescent, flakes with faceted butt.

4/40/28A, from railway-cutting 5-8' from surface. Material looks very advanced MSA: small disc-cores, biface point, backed blade of Gravette one, blade.

4/40/28B, from railway cutting close to surface. Apparently Wilton: small flakes of chert and agate; the only tool is a very small flake of ?milky quartz or agate.

In Natal Museum 50/225: 1 pick of Sangoan type, 1 large and 1 medium pebble-chopper, 2 medium end-scrapers, 2 small discs, 1 small blade-core, 1 side-scrapers, 2 fairly long thin points retouched, 3 blunt-backed blades of flake-form, 3 tanged blades.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 059

“Swan records: road-cutting on National Road: 7/6/50 Sangoan pick, backed blade; 31/8/52, Sangoan pick, developed MSA slender point, backed blade and core; September 1953, 2 trimmed points, 1 backed blade, 4 cores, all late MSA; 31/8/52, flakes.:

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 060

“The midden-site was in blown surface sand; the site itself formed a dark layer 2' thick in it, of which I saw traces in 1948. Below the blown sand was red sand, which rested on calcified dune.

Account of the midden-section and the various industries published by Cramb; querns were found.

In and just above the red sand on the railway-cutting I saw a few rough cores. Cramb records MSA tools on the surface of the red sand. Swan collected on the railway-cutting and sent to the Arch. Survey, JHB: surface, a very small backed blade, perhaps Wilton; 5-8' depth, a little MSA apparently advanced. This may be associated with the ferricrete later which I saw on the road, apparently grading to a 20' lagoon (see 3030BB 058); 10-15' depth, MSA.

I collected and placed in Natal Museum 1 lydianate core, 1 resharpening flake, 1 flake, 3 sherds (2 flat-rimmed, one with a pointed rim) NM 48/16.

Schofield records Smithfield and MSA type tools, European sherds and pottery of unusual type with dotted decoration (in NM 90/37) and a pipe of similar ornament.

4/40/33 collected by Swan apparently from this site; a pebble tool of midden-type; fragment of stone armring; 4 thick pieces of MSA with the brown-green patina of the dunes; shale disc 1" thick and about 6" across, flat underneath and perhaps used as fabricator; 1 pebble chopper; 1 end-scraper sent 31/8/52; 2 patinated large side-scrappers possibly Smithfield A; 5 chipped pebbles of coast type; 1 core ?agate for microblades. R. C. Walsh saw near south end of this site remains of a furnace and tuyeres, near the old dam just south of some casuarinas, about S30 08 00 E30 50 25. There was a furnace bottom with slag adhering. He saw this in 1947 before he was interested in collecting.

Cramb's material in Arch. Survey JHB 12/38/1 (some of which is now in Natal Museum 90/266): 6 pebble choppers, 1 large end-scraper, 4 other large pieces made on pebbles, rather atypical.

Microlithic material presumably from this site; Durban Museum unnumbered: agate backed blade, quartz end-scraper, rose quartz circular fabricator. Donor G. Cramb.

The Wilton material (NM 89/153) may be the "Umlaas variant of Smithfield C" mapped by Schoute-Vanneck & Walsh 1961."

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 061

"15' below surface, unassociated, R.C. Walsh found a ground and tanged lydianite arrow-head: presented to Arch. Survey JHB.

Added later: this would be a little to north of the main excavation in the red dune."

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 062

“Schofield collected from surface and in Arch Survey, JHB: 1 pebble-rubber; 1 thin coastal end-scraper; 1 piece of rolled shell used as shell-opener and chipped at end; 1 concavo-convex side-scraper; 1 massive side-scraper; 2 pebble-choppers; 1 rounded scraper on large pebble; 1 convex blunt-backed knife; 1 end-scraper made on a pebble.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 063

“Schofield records an NC1 pot and illustrates an NC3 pot in Durban Museum from Umgababa; these almost certainly came from this excavation, and they do not seem to be published elsewhere. Added later: Durban Museum register says "probably made by iron-smelting people" so perhaps slag was found on the site.

Added: May also be Durban Museum 3840, a cutting 2' from surface on north bank of R. Umgababa, lightly decorated sherds, d.d. J.A. Swan. [V. Ward, 2004. Davies altered the original locality from north to south, but he seems not to have considered his statement above].

Bantu-type skeleton from the site described by Galloway.

The evidence of Dart and Galloway is likely. Equivalence with Schofield and with Swan is not so certain.

In Durban Museum unnumbered are 4 restored pot (probably by Schofield); A, from Umgababa, herring-bone incision on round neck and pendant groups of semi-circles on shoulder, 3 round the whole pot. B, from Umgababa, band of rather wider irregular diagonal incisions round neck. C. N.L. [? No locality] narrow diagonally incised cordon round neck. D. N.L. [? No locality] contiguous bands of alternate diagonal incisions round neck.

Either at this site or nearby Denys Bowden says he found beads of ostrich eggshell, and blue and green glass beads [NM Acc. No. 90/45]

Wilton material from the lower level, published by Walsh & Swan, 1952 (fig 2 1-13). This material was in the hands of R.C.Walsh, but may now be in Archaeological Survey, Johannesburg. [Ward, 2004. ?4/40/49].

In Arch. Survey, JHB: 4/40/49. Wilton pieces mostly of chalcedony, backed blades, thumbnails, points; also 2 fair-sized chipped pebbles; ?redirecting flake. Other objects sent September 1953, thumbnail scraper and dimpled grindstone.

Shale discs from this site presumably, associated with advanced MSA Smithfield and pottery; see Malan, 1956: 91.

Schoute-Vanneck & Walsh note as found on this site, apparently on re-examination in November 1957 AC5519:AC5530.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of medium significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3B

3030BB 064

“Dart records Coastal Smithfield implements, microliths, pottery, animal-bones and parts of several skeletons.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of medium significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3B

3030BB 065

“There is exposed bench at 60' S.L., which is cut partly in shales and partly in marine or estuarine clays. The latter are certainly of some depth, and are presumably the fill of an incised channel belonging to a previous eustatic low-level. No cliff is visible.

On the bench are 3' of flattish marine pebbles mixed with a little coarse sand. The pebbles are of grey quartzite and of dolerite.

Above the marine deposit is red dune-sand rising to over 100' S.L.

Added later: In 1973 I saw the shale platform, but that part of it cut in clay was grassed over or destroyed.

CONTENT: In the red and (near surface) are many pebbles but few tools; a few specimens were sent to Ashmolean Museum, Oxford.

In the gravel none of the quartzite pebbles were worked. Lester King claimed as hand-axes some very weathered ovoid pieces, so thickly patinated that no sign of flaking could remain. A few were in shape suggestive of Late Acheulian hand-axes; but all must be considered very doubtful and none have been collected.

Among the pebbles was found one unrolled Sangoan pick. This had presumably slumped from the top of the dune.

Added later: Also 1 slightly abraded Late Acheulian hand-axe, donated by R.C. Walsh in 1984.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 066

“The site lay west of the old main road on south of Umgababa Lagoon. At 70' S.L. on what was apparently concreted red sand beneath 5' of loose dark turfy sand, were on a single level pebbles and flakes.

Ten pieces in Natal Museum: 1 smallish Sangoan pick; 1 large side-scraper; several flakes of MSA type, one denticulated; 1 blunt-backed blade with signs of use; 1 small cylinder, smoothed on side but not at ends, looks as if used as a rubber and pestle, ?associated. Pieces are of quartzite dolerite and shale.

Added later: probably from this site, in Dundee Museum: S16, 1 uniface red-stained pick, 1 shale chopper, 1 rough perforated disc of shale.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 067

“Material found at the base of the cutting, which had probably fallen from surface.

Added later: this record refers to the material in Arch. Survey Johannesburg. There is an entry of pottery in Durban Museum donated by J.A. Swan, and it is possible that portions of this site got to Durban: 4375. Pottery from Umgababa 21/9/39, added later: probably NC3.

Sherds of one or more ovoid pots of fine polished black ware. Flat bases. Some sherds are decorated a little below the rim with irregular horizontal rows of short vertical impressions. Others are undecorated, but decoration may have been confined to one side of the pot. Rim plain and slightly flattened.

In addition sherds from one or more heavily scored pots, probably NC3, one with scored cordons. Also a small pottery cylinder broken at one end, ? A lug.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 068

“Marine pebbles, mostly shale and dolerite, mixed with muddy sand, resting on a bench of shale about 18' MSL. The pebbles are of varying size. The underlying rock-bench is fairly soft and has been slightly eroded towards the modern lagoon. Pebbles were formerly seen on both banks, now are visible only on north bank. The deposit seems marine rather than estuarine, and ends sharply to north at a slight rise of the rock which seems to be the stump of a cliff. This may be Maud's 4 1/2 metre level. At the time of the beach there was probably a small river-mouth as today.

Most of the overlying red sand has been removed in a large pit at the side of the road; but a small block of sand has been left, overlying part of the beach. In section one

can see above rock - about 30' gritty red sand with occasional laid marine pebble, much lateriticised and probably beach-deposit; 3' of coarse but probably aeolian red sand; surface of flakes and pebbles, largely of TMS and probably MSA unrolled; rather more than 3' of red sand to a bushed surface.

From the beach 2 rolled flakes and 1 small rolled end-struck cleaver ? Fauresmith. Also 1 rolled and 1 unrolled flake. In Natal Museum 50/235: 2 slightly rolled pieces, one a large split pebble forming a pick but with no trimming on dorsal face; one heavily rolled flake, retrimmed to a side-scraper and slightly rolled. 1 piece of MSA from the upper level in the red sand. 67/5. 2 very rolled and weathered pieces, probably of dolerite. One is a large weathered flake, with apparently two other flakes removed on the opposite face to make a tool of cleaver-type. The other is a long pebble, whence one flake has been removed at one end.

These were collected on the floor of the sand-pit and were not in situ. From the physique almost certainly derived from the beach-gravel.

Schoute-Vanneck & Walsh collection: 89/21, 3 bifaces, 3 cores, 1 large flake.

Perhaps all the material (JHB 4/40/50) collected by Swan from Ingane came from this site; he found it in 1950. 7/6/50, large Sangoan pick, MSA blade, backed awls, end-scrapers; 9/10/51, pebble-core, several scrapers; 31/8/52, 2 end-scrapers, heavy elongated trimming-stone; Sept 1953, 2 uniface Sangoan picks, 3 flakes.”

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3C

3030BB 069

“Four small middens on sand.

See Schoute-Vanneck & Walsh excavation report in site record file in Natal Museum.

Material in Arch. Survey JHB, 1/60: Wilton, microliths, bone points, pebbles, broken pebbles, a few coarse sherds, ostrich eggshell beads.

In Natal Museum:

89/18 from Midden A excavation: ochre, segments, cores, chips, chunks, flakes, hand-axes, potsherd, glass bead, 15 OES beads, bone, teeth, fish, shell, daga, charcoal.

89/29 from Midden B excavation: EIA sherds - Ndongondwana phase.

89/20 microlithic site: 2 glass beads, outil ecailles. Schoute-Vanneck & Walsh: record a small Wilton collection from a wind-eroded patch about 4' across in front of the Holiday Camp hostel among the dunes. This seems not to be included in the published report. The pieces apparently lay in grey-black soil. 1 finely worked quartz backed bladelet, quartz chip, perhaps a crude scraper, 3 white trade-beads."

The site is in the environmental buffer and will not be affected.

Significance: The site is of medium significance.

Mitigation: The site would require a resurvey and possible test pit excavations if affected.

AHRA Rating: 3B

3030BB 074

"Clearly quite a different site from the complex round the road-bridge on railway, 4/40/37 is probably the site recorded by Schoute-Vanneck & Walsh, though no precise location is given, on west of cutting for a cane-road, just above the railway and old station (probably Drift), worn out by erosion from cane lorries. This was a thin line 30-40" below surface of upper brown sand, in places up to 48", just above junction of brownish sand and a redder sand. No shell in this layer save a pocket about 3" across of mussels

which may be intrusive from above.

JHB 4/40/37 from a Wilton site near Drift station at 29 miles from Durban. A polished phallic object, found in the railway-cutting at 15-18" below surface; ? Wilton, also a pounder, and a broken shale disc roughly made but with perforation neat and polished.

Schoute-Vanneck & Walsh's record of a site which is probably this site: choppers made on smooth rounded pebbles about 3 x 3 x 2 1/2" thick, one in tillite. Broken perforated shale disc NM 89/70: Schoute-Vanneck donation. [Ward is this the same disc as above?]. Few quartz chips (some also in a nearby exposure probably of same horizon). Chips of lydianite and tillite; pebbles about 2" across. At this place were a few sherds of NC2 texture. None found in the stone-level and they are probably derived from a higher level which could not be determined."

The site has been damaged/destroyed by housing and road infrastructure.

Significance: The site was of low significance.

Mitigation: The site was sampled. No mitigation required

SAHRA Rating: 3B

The site records indicate (summarised in Table 2) that this specific area had received many surveys and excavations from the 1930s to the 1970s. Most of the of the Stone Age sites occur as a lag deposit on the hills. These hills also had Iron Age deposits. All of the sites on the hills have been damaged; however they were adequately sampled in the past. The sites that were not affected by the peri-urban housing are located along the dune cordon in the indigenous coastal forest. These sites also fall under the environmental buffer zones and this area will not be affected.

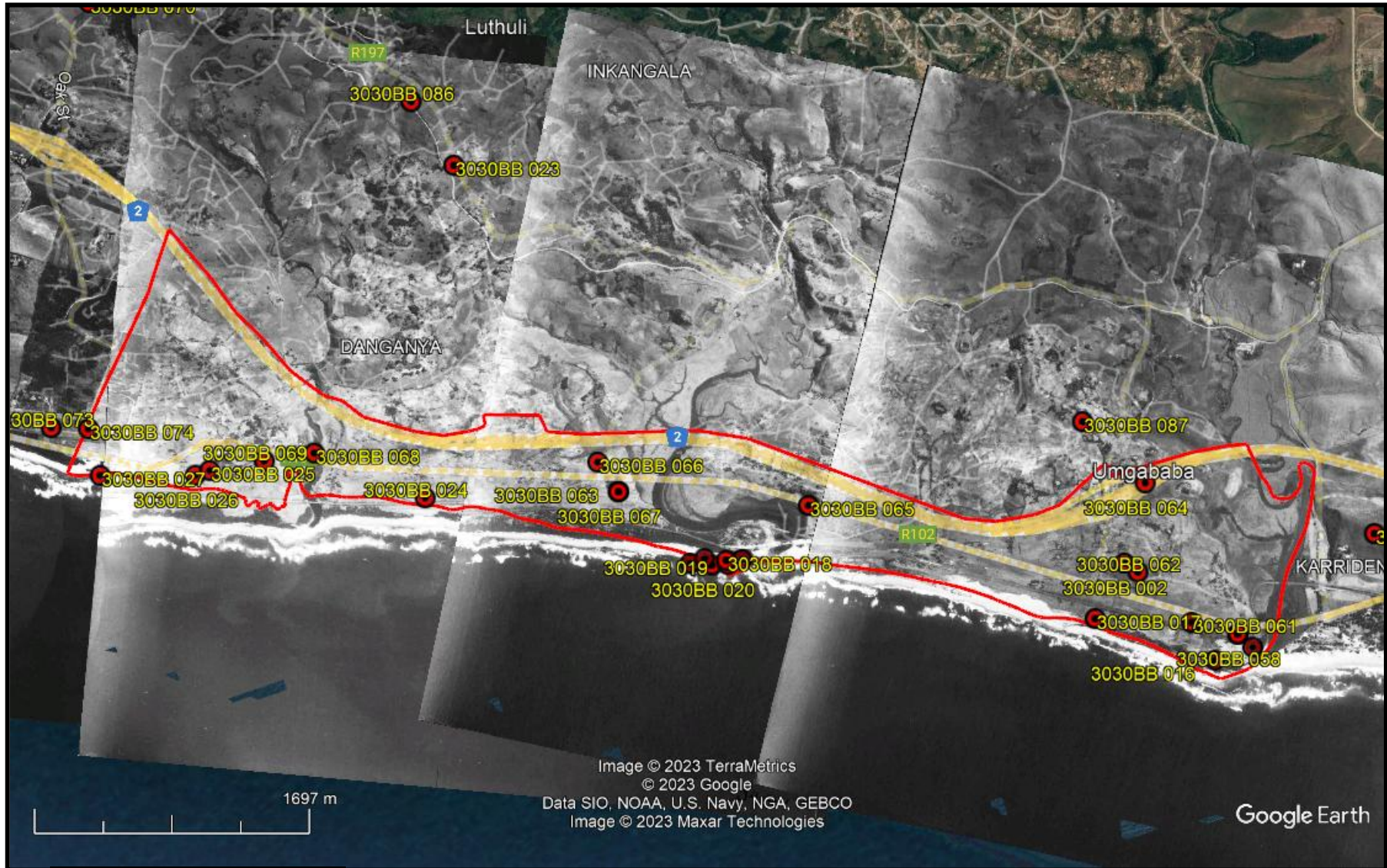
The 1937 aerial photograph indicates that there are a few settlements in the northern and southern parts of the study area (fig. 6). This is shown on the 1938 topographical map (fig. 7).

By 1968, the numbers of settlements have increased dramatically and have replaced the previous settlements (fig. 8). According to the KZN Museum site record forms there were sand mines in this area as well, and these would have affected these older settlements. By 2023 there is even a higher increase of houses, roads and other servitudes. Fig. 9 shows the extent of the developments that would have destroyed all of the archaeological sites and older settlements.

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



FIG. 6: LOCATION OF THE STUDY AREA IN 1937³



³117B_058_54230, 117B_058_54231, 117B_058_54232, 117B_058_54233

FIG. 7: LOCATION OF THE STUDY AREA IN 1938⁴



⁴ 3030BB Umkomaas 1938

FIG. 8: STUDY AREA IN 1968



FIG. 9: CURRENT STUDY AREA

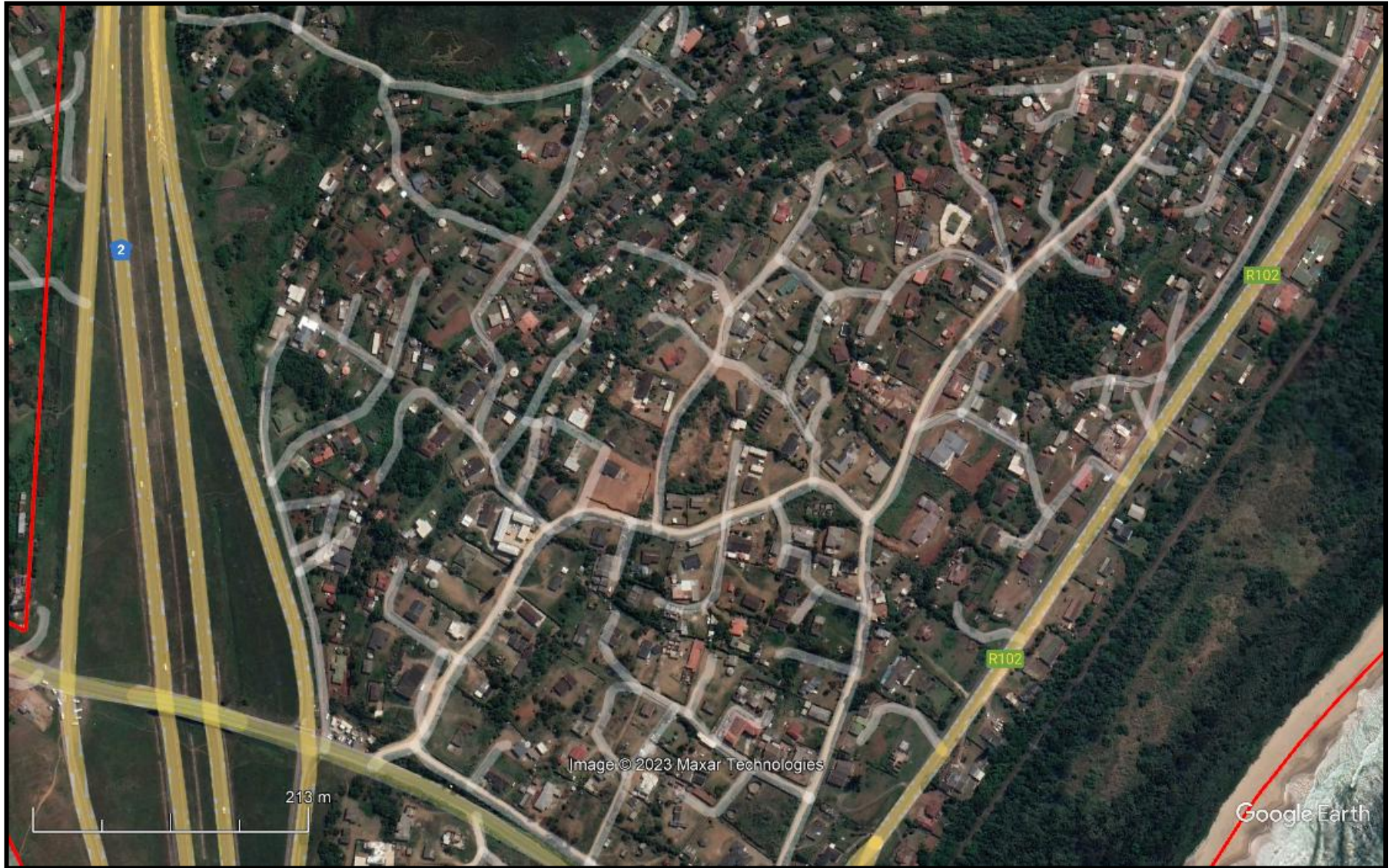


TABLE 2: RECORDED SITES WITHIN THE STUDY AREA

Site name	Co-ordinates	Still exist	In an environmental buffer
3030BB 002	S30 08 09 E30 50 16	No	No
3030BB 016	S30 07 58 E30 50 44	Possible	Yes
3030BB 017	S30 08 18 E30 50 26	Possible	Yes
3030BB 018	S30 09 24 E30 49 46	Possible	Yes
3030BB 019	S30 09 24 E30 49 47	Possible	Yes
3030BB 020	S30 09 27 E30 49 46	Possible	Yes
3030BB 021	S30 09 28 E30 49 44	Possible	Yes
3030BB 022	S30 09 31 E30 49 44	Possible	Yes
3030BB 024	S30 10 17 E30 49 10	Possible	Yes
3030BB 026	S30 10 59 E30 48 48	Possible	Possible
3030BB 027	S30 11 17 E30 48 41	Possible	Yes
3030BB 032	S30 09 21 E30 49 47	possible	Yes
3030BB 058	S30 07 52 E30 50 40	No	No
3030BB 059	?? S30 07 52 E30 50 40	No	No
3030BB 060	S30 07 50 E30 50 44	Possible	Yes
3030BB 061	S30 08 00 E30 50 34	No	No
3030BB 062	S30 08 07 E30 50 19	No	No
3030BB 063	S30 09 40 E30 49 23	No	No
3030BB 064	S30 08 E30 50	No	No
3030BB 065	S30 09 05 E30 49 40	No	No
3030BB 066	S30 09 42 E30 49 15	No	No
3030BB 067	S30 09 40 E30 49 23	No	No
3030BB 068	S30 10 35 E30 48 52	No	No
3030BB 069	S30 10 45 R30 48 50	No	No
3030BB 074	S30 11 16 E30 48 30 approximately	No	No

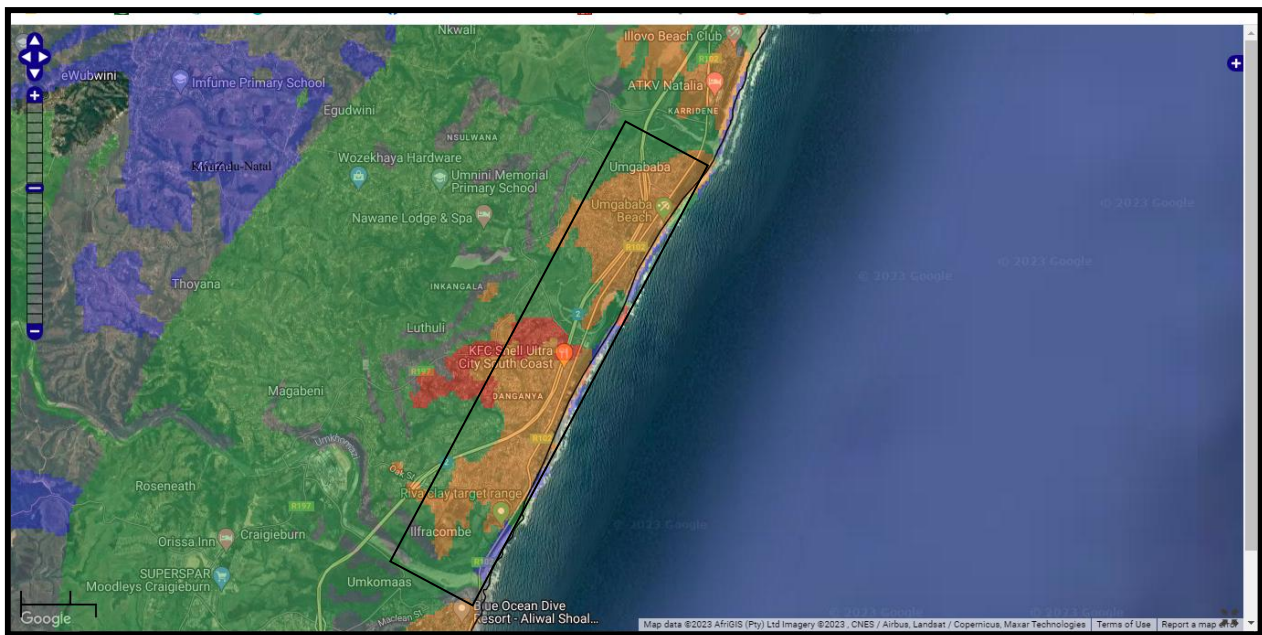
PALAEONTOLOGICAL SENSITIVITY

The area is mostly in an area of medium and high palaeontological sensitivity (fig. 10). Dr A. Smith undertook a desktops study for the proposed project (Appendix A). Part of the proposed development is underlain by Vryheid Formation rocks. Although the Vryheid Formation is flagged red by the Sahrís Map, no significant fossils have been found in this rock type in this area. Other parts of the proposed Umnini Rural Housing Development are underlain by the

Umkwelane Formation (formerly Berea Red Sandstone). This is flagged yellow but no significant fossils have been found within this lithology.

The chances of encountering significant fossils are **Low**, but **Not Zero**; consequently a **“Chance Find Protocol”** has been included.

FIG. 10: PALAEOLOGICAL 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.

CONCLUSION

A desktop heritage survey was undertaken for the proposed Umnini Rural Housing Project. The housing footprint occurs in an area that had received a lot of archaeological investigation from the 1930s to 1960s. A total of twenty-six sites were recorded and most of them were sampled or excavated. The Early, Middle and Late Stone Age sites were mostly in a lag deposit or in concentrations of each Age. These deposits were extensively sampled. These types of deposit are currently considered mostly of low significance and are not sampled unless there are some rare stone tools. Most of these sites occurred along the hills and have now been extensively damaged due to mining, housings and/or road infrastructure. These sites occurred directly with the current housing area but do not require further mitigation.

Late Stone Age, Early Iron Age and Late Iron Age shell middens were excavated. These sites tend to occur along the dune cordon and the coastal forest. The sites appear to be in tact and only affected by excavations and natural weather. These sites also occur within the environmental buffer and will not be affected by the proposed housing development. All of these shell midden sites need a 50m buffer around them. The buffer is an exclusion zone and any development within it will require a survey.

REFERENCES

Maps:

3030CB Umgababa 1938, 1993

117B_058_54230

117B_058_54231

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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.

A handwritten signature in black ink, appearing to read 'G. Anderson', with a horizontal line underneath.

Gavin Anderson
Archaeologist/Heritage Impact Assessor

APPENDIX A
PIA DESKTOP REPORT

**DESKTOP PALEONTOLOGICAL
ASSESSMENT FOR THE PROPOSED UMNINI
RURAL HOUSING DEVELOPMENT,
ETHEKWINI MUNICIPALITY, KWAZULU
-NATAL**

FOR

**UMLANDO: Archaeological Surveys & Heritage Management
PO Box 102532, Meerensee, KwaZulu-Natal 3901
phone (035)7531785 fax: 0865445631
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by

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Telephone: 031 208 6896
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20 April, 2023

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 constructing the proposed Umnini Rural Housing Development in the southern part of eThekweni 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.

Part of the proposed development is underlain by Vryheid Formation rocks. Although the Vryheid Formation is flagged red by the Sahrís Map, no significant fossils have been found in this rock type in this area. Other parts of the proposed Umnini Rural Housing Development are underlain by the Umkwelane Formation (formerly Berea Red Sandstone). This is flagged yellow but no significant fossils have been found within this lithology.

The chances of encountering significant fossils are **Low**, but **Not 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
WWTW:	Waste Water Treatment Works

1. 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 Umnini Rural Housing Development, in the south of eThekweni Municipality, KwaZulu-Natal (Figure 1). 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.

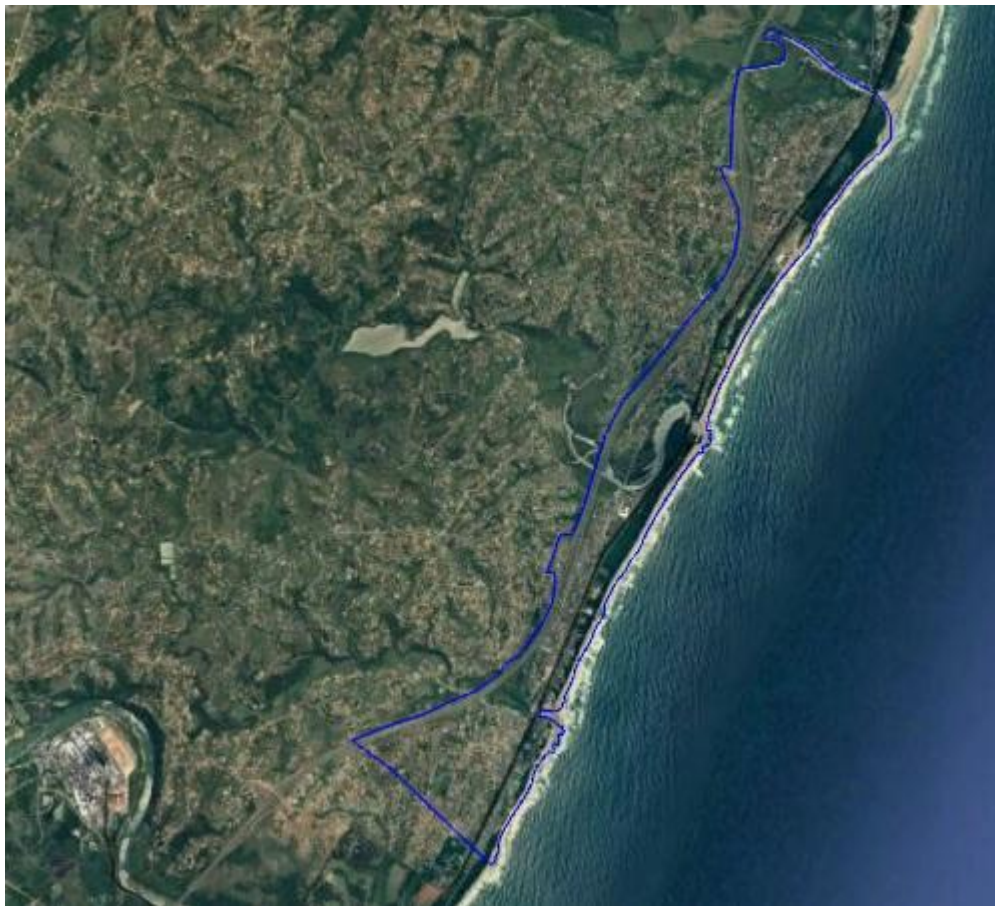


Figure 1: Location of the proposed Umnini Rural Housing Development.

2. SCOPE AND PURPOSE OF REPORT

A Palaeontological Impact Assessment (PIA) is a means of identifying any significant palaeontological material, 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 palaeontological heritage of South Africa. This Desk-Top PIA 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.

3. METHODOLOGY

Geological maps, a literature review and personal experience (see Section 9) were used in this research.

4. GEOLOGY

The entire site is underlain by the Vryheid Formation (Pv), Umkwelane Formation (Qb), Pietermaritzberg Formation (Pp) and modern dunes (Qs) (Figure 2).

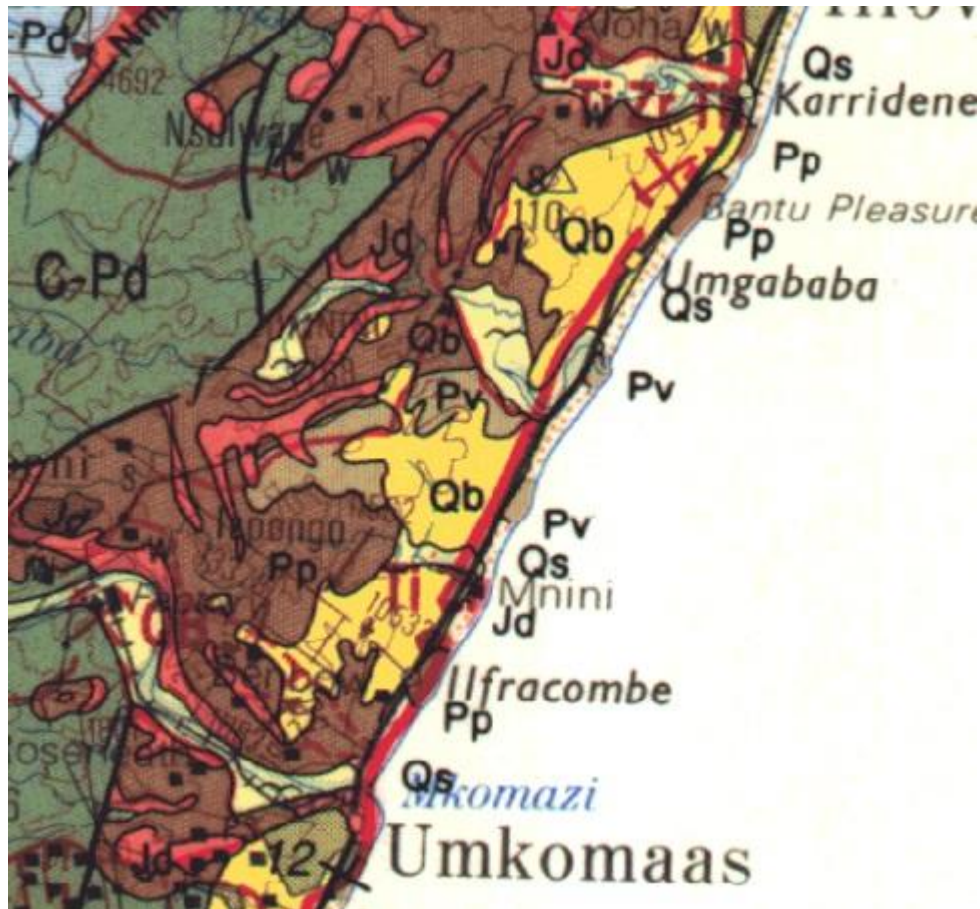


Figure 2: Approximate area of the proposed Umnini Rural Housing Development. Extract from the 125 000 scale Geological Map: Port Shepstone 3030. PV (light brown) designates the Vryheid Formation, Pp (dark brown) designates the Pietermaritzburg Formation, Qb represents the (formerly Berea Red Sandstone) and Qs the active dune cover.

Umkwelane Formation (Berea Red Sand)

The Umkwelane Formation is Mid-Miocene to Pliocene Ma (14 - 4 million years) in age (Botha, 2018). It is an ancient coastal dune cordon, composed of fossil aeolian dunes. The feldspar component has been strongly weathered to give a clayey red matrix which gives this lithology its characteristic red colour (Figure 3). The top metre of this lithology has been deeply disturbed due to prehistorical, historical and current agricultural and developmental practises.



Figure 3: Earth cut showing the characteristic appearance of the Umkwelane Formation (Berea Red Sand).

Pietermaritzburg Formation

The Pietermaritzburg Formation comprises a blue-black siltstone. The Pietermaritzburg Formation forms the lower part of the Ecca Group (old Lower Ecca) which immediately follows the Permo-Carboniferous Dwyka Group, which is the base of the Karoo Supergroup. The Dwyka Group represents the Late Palaeozoic Glaciation. This grades upward into the overlying Vryheid Formation and is of approximately the same age.

Vryheid Formation

The Vryheid Formation is part of the Karoo Supergroup. The Vryheid Formation forms the central part of the Ecca Group (old Middle Ecca) which immediately follows the Pietermaritzburg Formation. The Permian aged Vryheid Formation is Kungurian Stage in age, ie 260Ma (Green and Smith, 2012). It comprises predominantly coarse-grained sandstone and siltstones, interbedded with dark shales and economic coal beds. In this region, the Vryheid Formation is interpreted as shallow marine, deltaic, fluvial and floodplain deposits. These deltas (now deltaic deposits) built out into the ancient Karoo Sea, a massive inland sea which was located within the central part of the ancient

Gondwana Supercontinent (Johnson et al, 2009). Coal seams developed within swamp deposits which developed on this deltaic and fluvial architecture.

Karoo Dolerite

Karoo-aged dolerite dykes and sills may be encountered. (Figure 5).



Figure 5: Dolerite dyke as it might appear during excavations. Notice how the Vryheid Formation beds have been pushed upward (on right) by the intrusive igneous rock.

Dolerite rock is part of the Karoo Large Igneous Province (LIP). The Karoo LIP was a sequence of lavas up to 4.5 km thick which was deposited during the Middle Jurassic about 184 Ma (million years ago). This igneous deposit was extruded as a Continental Flood Basal (CFB). This process takes place by fissure eruption. This CFB event triggered the break-up of the Gondwana supercontinent. The dolerite dyke may have been one of the conduits whereby the igneous rock was conveyed to the surface and erupted (Hastie et al., 2014)

5. PALAEOLOGY

The colour coding used in the Sahr's Palaeosensitivity Map is shown in Table 1. The Vryheid Formation is flagged red and the 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

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** area), in practice it is a **Low Palaeosensitivity** risk, as it consists of weathered sand where the chances of encountering palaeontological material are low.

Active Dunes (Qs)

Fossils could theoretically be found within the modern sand cover, but no significant finds have been reported from this area.

Vryheid Formation

The SAHRIS Palaeosensitivity (Table 1: Figure 6 – red shaded area) considers the Vryheid Formation 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 in the southern part of the basin (MacRae, 1999). The Whitehill Formation (500 km to the southwest), within the Main Karoo Basin, *may* be a correlative of the Vryheid Formation, however they are not physically connected. Further, recent research has suggested that the lower Vryheid Formation in coastal KwaZulu-Natal area has a different source (Maurice Ewing Bank) to the rest of the Vryheid Formation in KwaZulu-Natal (Hastie et al., 2019).

Thin (uneconomic) coal seams are known from the Vryheid Formation in this region (Tavener Smith, 1982; 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.

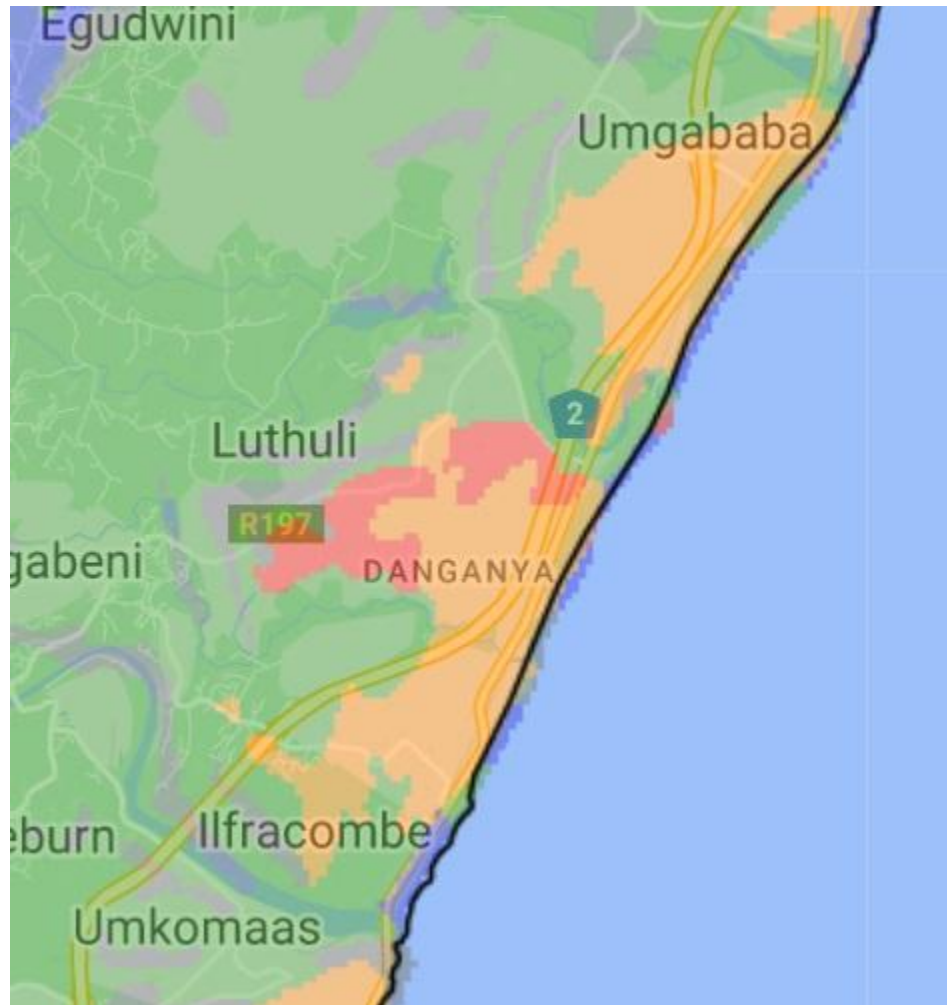


Figure 6: Palaeosensitivity of the Umnini Rural Housing Development area.. Extract from Sahr's Palaeosensitivity Map).

Pietermaritzburg Formation

The Pietermaritzburg Formation contains occasional trace and leaf (usually fragments) fossils, none of which are paleontologically significant.

Karoo Dolerite

This rock is an igneous intrusive rock and by definition cannot be fossiliferous.

6. SUMMARY

The chance of significant fossils being found on this site is **Low**, but not **Zero**. A “**Chance Find Protocol**” has therefore been included to cover this eventuality. No further palaeontological work is required, unless triggered by the “**Chance Find Protocol**” in which a suitably qualified palaeontologist must be consulted. The “**Chance Find Protocol**” must form part of the Environmental Management Programme (EMPr) for the site,

7. 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.

8. REFERENCES

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9. **DETAILS OF SPECIALIST**

Dr Alan Smith: CV (short)

Dr Alan Smith Pr. Sc. Nat., I.A.H.S.

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

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

Role: Specialist Palaeontological Report production

Expertise of the specialist:

- MSc in palaeontology. The Stromatolites of Etosha Pan. (University of KwaZulu-Natal).
- Alan has published 9 refereed journal articles on “Stromatolites”.
- He is part of the EPStrom international collaboration on extant stromatolites. This is sponsored by the Natural Environment Research Council, UK (NERC) and includes Essex (UK) Nelson Mandela, Ulster (UK) and KwaZulu-Natal Universities.
- PhD in Geology (University of KwaZulu-Natal), 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 more than 50 journal articles with +620 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.
- Alan has been writing Palaeontological Reports since 2014.