Phase 1 Archaeological Impact Assessment –

Residential Development, Farm RE/1234, Gonubie, East London, BCMM, Eastern Cape

- 1 June 2015 -

Report to:

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Specialist Declaration of Interest

I, Karen van Ryneveld (Company – ArchaeoMaps; Qualification – MSc Archaeology), declare that:

- I am suitably qualified and accredited to act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its' proponent or any subsidiaries, aside from fair remuneration for specialist services rendered; and
- That work conducted has been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently.

Signature – - 1 June 2015 -

Executive Summary

Terms of Reference -

NS Environmental have been appointed as independent EAP by the project proponent and landowner Alibiprops 5 (Pty) Ltd, to apply for EA, including an EIA and EMPr report, to the EC DEDEAT for the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape. The development is situated at general development co-ordinate S32°56'54.8"; E27°57'22.3", with the study site comprising an approximate 60ha area. The project proponent is intending to establish a residential development; the development application includes all relevant services such as water, sanitation, power and access roads as well as necessary subdivision and rezoning applications.

ArchaeoMaps was appointed by NS Environmental to conduct the Phase 1 AIA as specialist component to the developments' HIA. This report represents the Phase 1 AIA only, with findings and recommendations thereof to be included in the EIA and EMPr.

The Phase 1 Archaeological Impact Assessment -

Project Area: *Residential Development – Farm RE/1234, Gonubie,* East London, BCMM, Eastern Cape – app. 60ha [1:50,000 Map Ref – 3227DD].

Coverage & Gap Analysis: Pre-feasibility and field assessment.

Field Methodology: One day field assessment; GPS co-ordinates – Garmin GPSmap 62s; Photographic documentation – Pentax K20D. Site significance assessment – SAHRA 2007 system.

Summary:

- No archaeological or cultural heritage developmental 'fatal flaws' identified;
- No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, identified during the field assessment;
- [Should any incidental archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, be encountered during the course of development the process described in the '*Heritage Protocol for Incidental Finds during the Construction Phase*' should be followed.]

Map Code	Site	Co-ordinates	Recommendations
***Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, East London**			
-	Residential Development – Farm RE/1234, Gonubie	S32°56'54.8"; E27°57'22.3"	**N/A**

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape, proceeds as applied for without the developer having to comply with additional heritage compliance requirements prior to commencement of construction.

The EC PHRA APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

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1 - Terms of Reference

NS Environmental have been appointed as independent Environmental Assessment Practitioner (EAP) by the project proponent and landowner Alibiprops 5 (Pty) Ltd, to apply for Environmental Authorization (EA), including an Environmental Impact Assessment (EIA) and Environmental Management Plan (EMPr) report, to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (EC DEDEAT) for the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, Buffalo City Metropolitan Municipality (BCMM), Eastern Cape. The development is situated at general development co-ordinate S32°56'54.8"; E27°57'22.3", with the study site comprising an approximate 60ha area. The project proponent is intending to establish a residential development; the development application includes all relevant services such as water, sanitation, power and access roads as well as necessary subdivision and rezoning applications.

ArchaeoMaps cc (ArchaeoMaps) was appointed by NS Environmental to conduct the Phase 1 Archaeological Impact Assessment (AIA) as specialist component to the developments' Heritage Impact Assessment (HIA). This report represents the Phase 1 AIA only, with findings and recommendations thereof to be included in the EIA and EMPr. Terms of Reference (ToR) for the Phase 1 AIA, with specific reference to archaeological and basic cultural heritage compliance requirements are summarized as:

- Undertake a desktop study and field assessment to identify important archaeological and cultural heritage resources in the area. In particular identify:
  - Potential sites of archaeological and cultural heritage significance (GPS co-ordinates to be provided for planning purposes);
- Identify any potential 'fatal flaws' linked to the proposed development;
- Describe the findings of the study and their potential implications for the proposed project. This should include a description and assessment of the significance of the impacts of the proposed activities on the heritage resources; and
- Provide detailed guideline measures to manage any impacts, particularly during the construction phase but including the implementation phase, and an assessment of their likely effectiveness.

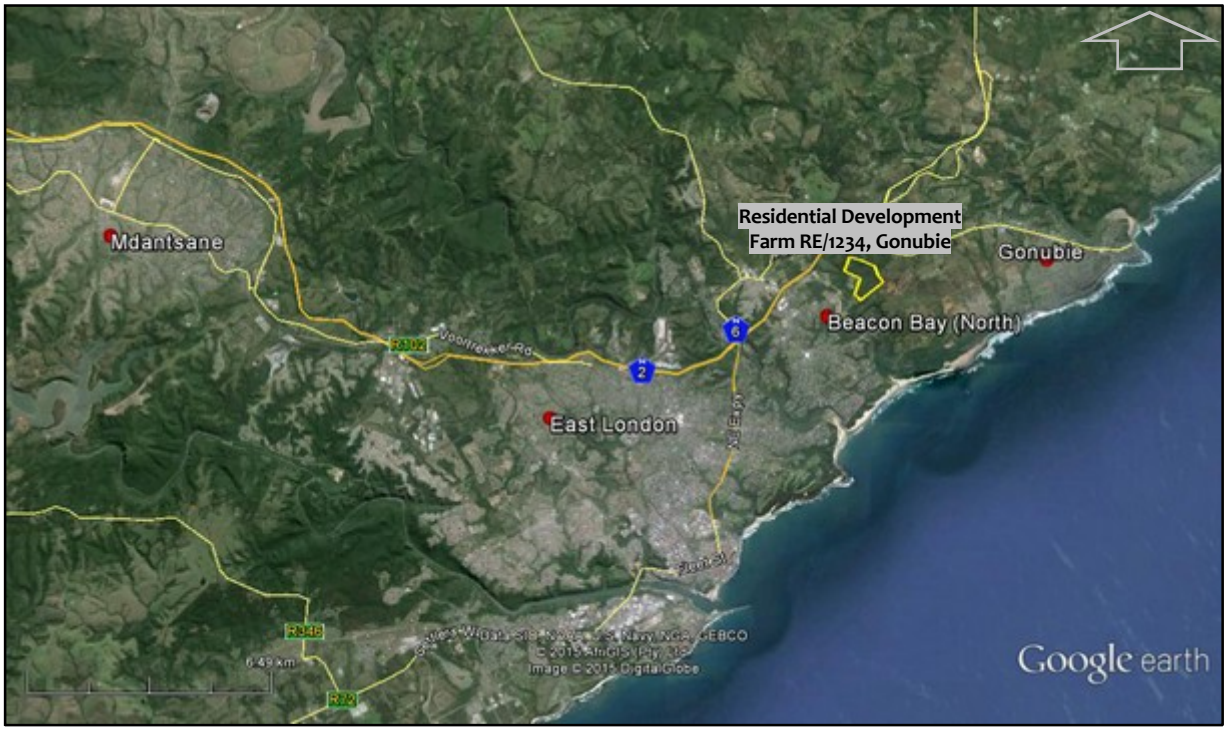
1.1.1) Development Location, Details and Impact

The proposed *Residential Development – Farm RE/1234, Gonubie,* is situated at general development co-ordinate S32°56'54.8"; E27°57'22.3" on the approximate 60ha property Farm RE/1234, Gonubie, East London, BCMM, Eastern Cape [1:50,000 Map Ref – 3227DD]. The study site is bounded to the south by the Qinira River and basically accessible from both the Beacon Bay and Gonubie suburbs.

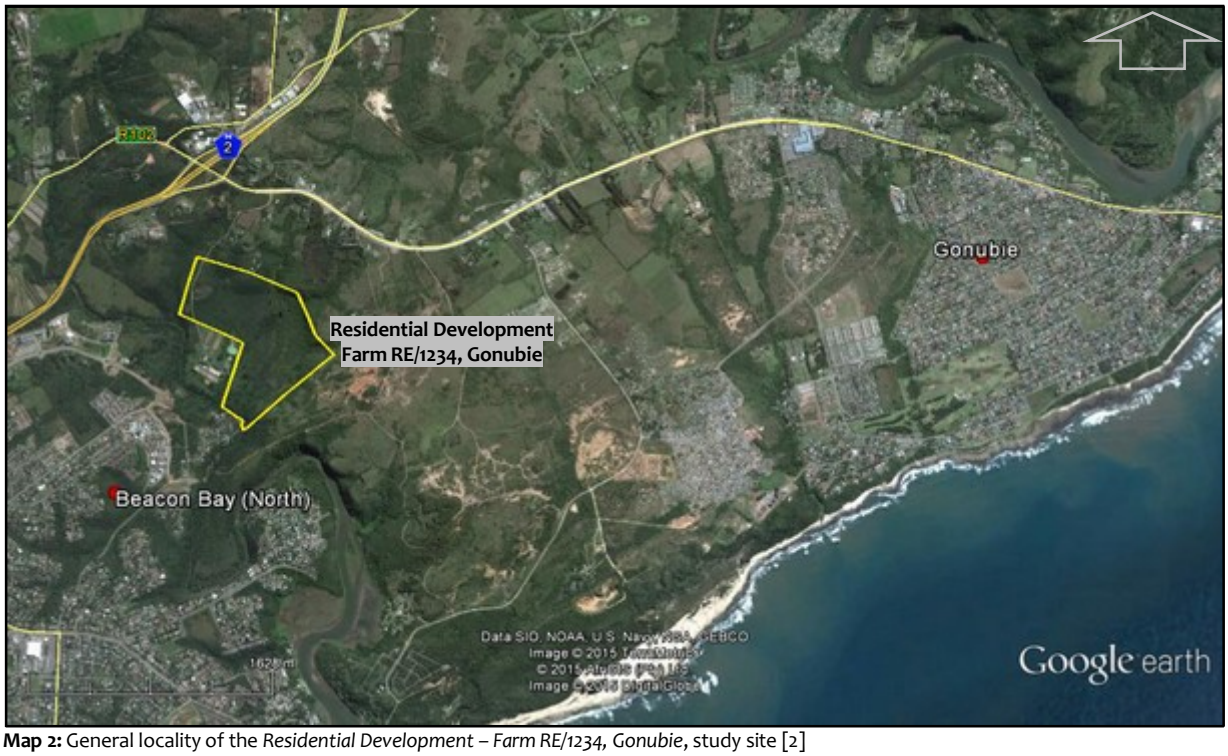
The project proponent and landowner, Alibiprops 5 (Pty) Ltd, intends to subdivide and rezone the property into various land uses, including (NS Environmental 2014):

- 50 sites of Residential – 1,000m² and above;
- 9 sites of Residential – 600-1,000m²;
- 210 sites of Residential – 350-600m² and above;
- 4 sites of Block Residential;
- 12 sites of Open Space.

[The development application includes all relevant services such as water, sanitation, power and access roads.]



Map 1: General locality of the *Residential Development – Farm RE/1234, Gonubie*, study site [1]



Map 2: General locality of the *Residential Development – Farm RE/1234, Gonubie*, study site [2]

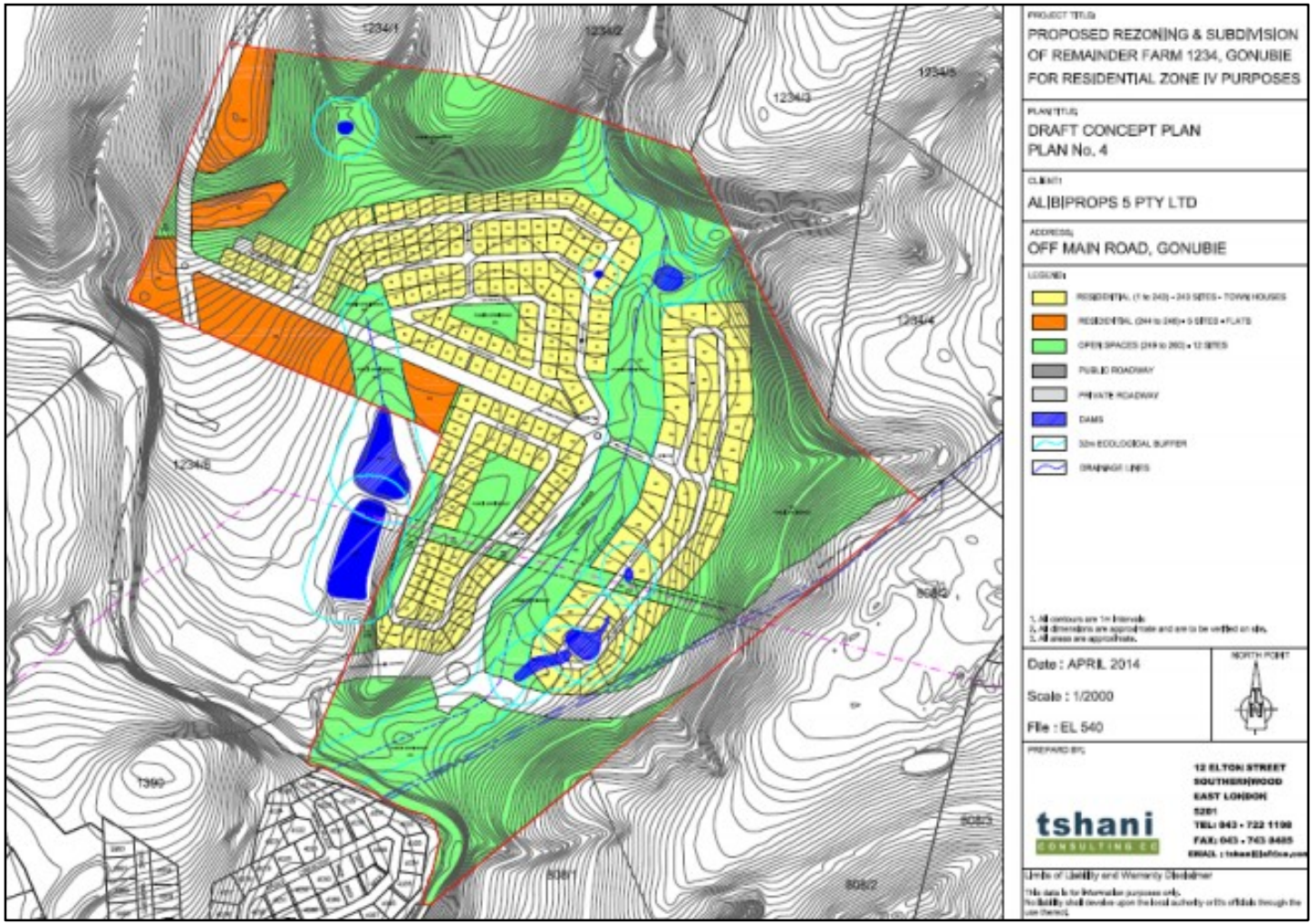
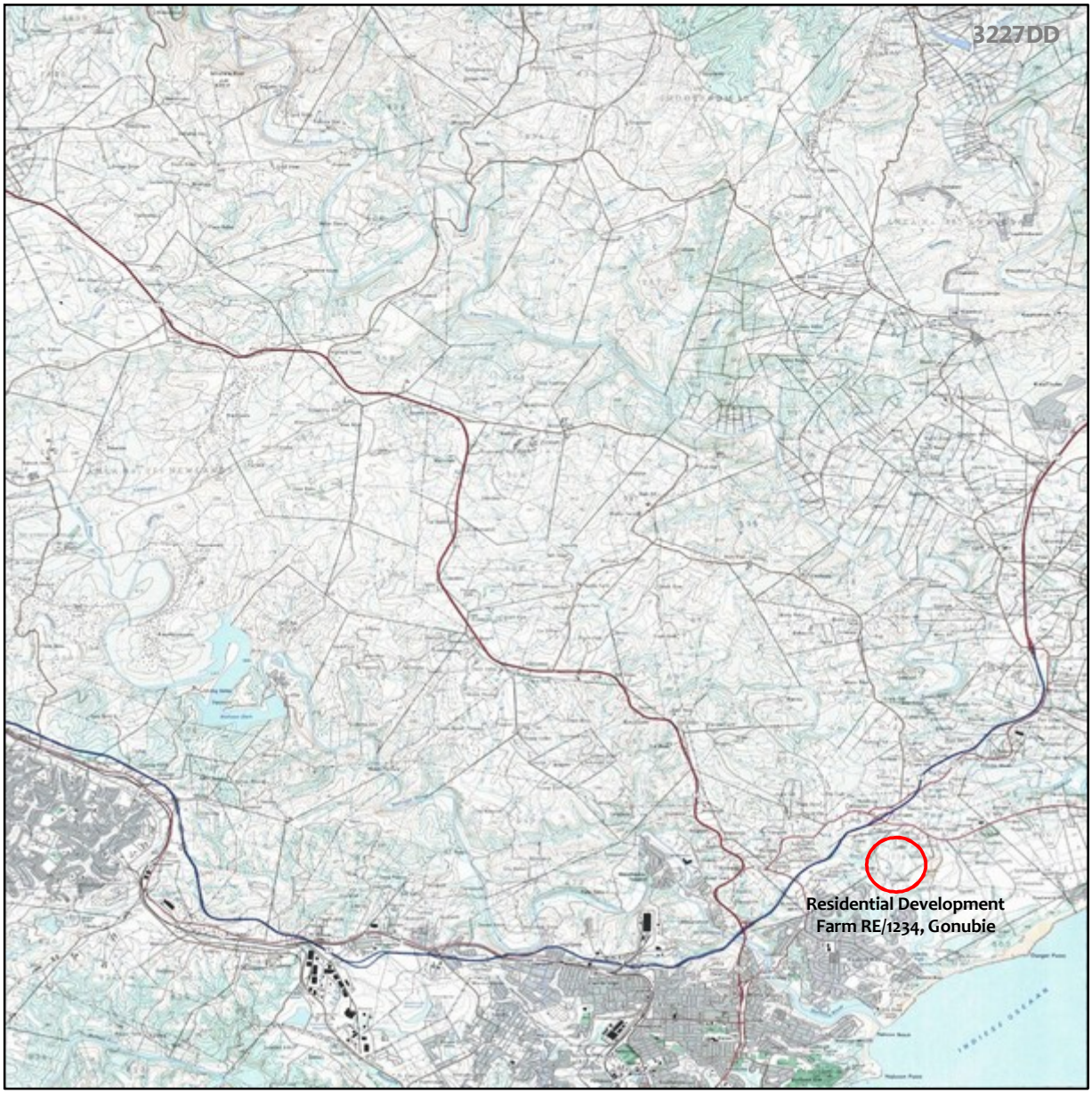


Figure 1: Proposed layout of the *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape (NS Environmental 2014)



Map 3: Locality of the *Residential Development – Farm RE/1234, Gonubie*, study site [1:50,000 Map Reference – 3227DD]

2.1.1) Archaeological Legislative Compliance

The Phase 1 Archaeological Impact Assessment (AIA) for the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, Buffalo City Metropolitan Municipality (BCMM), Eastern Cape, was requested to meet the Eastern Cape Provincial Heritage Resources Authority's (EC PHRA) requirements with reference to archaeological and basic cultural heritage resources in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38(1)(a), 38(1)(c)(i) and 38(1)(d).

NHRA 1999, Section 38

1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorized as –
   - **a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;**
   - b) the construction of a bridge or similar structure exceeding 50 m in length;
   - **c) any development or other activity which will change the character of a site –**
     - i. **exceeding 5 000 m² in extent;** or
     - ii. involving three or more existing erven or subdivisions thereof; or
     - iii. involving three or more erven or subdivisions thereof which have been consolidated within the past five years; or
     - iv. the costs which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
   - d) **the rezoning of a site exceeding 10 000 m² in extent;** or
   - e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

   must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Table 1: Extracts from the NHRA 1999, Section 38

The Phase 1 AIA aimed to locate, identify and assess the significance of cultural heritage resources, inclusive of archaeological deposits / sites, built structures older than 60 years, burial grounds and graves, graves of victims of conflict and basic cultural landscapes or viewscapes, as defined and protected by the NHRA 1999, that may be affected by the development.

This report comprises a Phase 1 AIA, including a basic pre-feasibility study and field assessment only.

Additional relevant legislation pertaining to the Phase 1 AIA is listed as:

- National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2014).

2.1.2) Methodology & Gap Analysis

The Phase 1 AIA includes a basic pre-feasibility study and field assessment:

- The pre-feasibility assessment is based on the Appendices A and B introductory archaeological literature. In addition the SAHRA 2009 Mapping Project Database (MPD), SAHRIS and the SAHRA Database on declared Provincial Heritage Sites (PHS) – Eastern Cape, were consulted. The study excludes consultation of museum and university databases.

- The field assessment was done over a 1 day period (2015-05-25) with fieldwork conducted by the author and assisted by Julius Nkoma. The assessment was done by foot and off-road vehicle and limited to a Phase 1 surface survey. GPS co-ordinates were taken with a Garmin Montana 650 (Datum: WGS84). Photographic documentation was done with a Pentax K20D camera. A combination of Garmap and Google Earth software was used in the display of spatial information.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations were done according to the system prescribed by SAHRA (2007).

SAHRA Archaeological and Cultural Heritage Site Significance Assessment			
Site Significance	**Field Rating**	**Grade**	**Recommended Mitigation**
High Significance	National Significance	Grade I	Site conservation / Site development
High Significance	Provincial Significance	Grade II	Site conservation / Site development
High Significance	Local Significance	Grade III-A	Site conservation or extensive mitigation prior to development / destruction
High Significance	Local Significance	Grade III-B	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	Grade IV-B	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	Grade IV-C	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Table 2: SAHRA archaeological and cultural heritage site significance assessment ratings and associated mitigation recommendations

2.1.3) Assessor Qualification & Accreditation

Karen van Ryneveld (ArchaeoMaps):

- Qualification: MSc Archaeology (2003) WITS University, Johannesburg / Certificate GIS (2007) NMMU University, Port Elizabeth.
- Accreditation: Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management (CRM) practitioner [member nr – 163]
    1. 2004 – Association of Southern African Professional Archaeologists (ASAPA) – Professional Member.
    2. 2005 – ASAPA CRM Section: Accreditation – Field Director (Stone Age, Iron Age, Colonial Period).
    3. 2010 – ASAPA CRM Section: Accreditation – Principle Investigator (Stone Age).

Karen van Ryneveld is a SAHRA / AMAFA / EC PHRA / HWC listed CRM archaeologist.

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of more than 300 Phase 1 AIA studies. Phase 1 AIA work is centered in South Africa, focusing on the Northern and Eastern Cape provinces and the Free State. She has also conducted Phase 1 work in Botswana (2006/2007). In 2007 she started ArchaeoMaps, an independent archaeological and heritage consultancy. In 2010 she was awarded ASAPA CRM Principle Investigator (PI) status based on large scale Phase 2 Stone Age mitigation work (De Beers Consolidated Mines – Rooipoort, Northern Cape – 2008/2009) and has also been involved in a number of other Phase 2 projects including Stone Age, Shell Middens, Grave / Cemetery projects and Iron Age sites.

In addition to CRM archaeology she has been involved in research, including the international collaborations at Maloney's Kloof and Grootkloof, Ghaap plateau, Northern Cape (2005/2006). Archaeological compliance experience includes her position as Head of the Archaeology, Palaeontology and Meteorites (APM) Unit at AMAFA aKwa-Zulu Natali (2004).

2.2.1) Pre-feasibility Summary

Based on a basic introductory literature assessment of South African archaeology (See Appendices A and B) and background heritage database research, the probability of archaeological and cultural heritage sites situated within or in direct proximity to the *Residential Development – Farm RE/1234, Gonubie* study site can briefly be described as:

Archaeological and Basic Cultural Probability Assessment – Residential Development – Farm RE/1234, Gonubie, East London, BCMM, EC			
Primary Type / Period	**Sub-Period**	**Sub-Period Type Site**	**Probability**
EARLY HOMININ / HOMINID	-	-	None-Low
	Graves / Human remains: High scientific significance		
STONE AGE	Earlier Stone Age (ESA)		Low
	Middle Stone Age (MSA)		Medium
	Later Stone Age (LSA)		Medium-High
		Rock Art	None
		Shell Middens	High
	Graves / Human remains: ESA & MSA – High scientific significance; LSA – High scientific & social significance		
IRON AGE	Early Iron Age (EIA)		Low
	Middle Iron Age (MIA)		None
	Later Iron Age (LIA)		Medium
	Graves & Human remains: EIA – High scientific & medium social significance; MIA & LIA: High scientific & social significance		
COLONIAL PERIOD	Colonial Period		High
		LSA – Colonial Period Contact	None
		LIA – Colonial Period Contact	Low
		Industrial Revolution	Low
		Apartheid & Struggle	Low
	Graves / Human Remains: Medium-high scientific & high social significance		

Table 3: Archaeological and basic cultural probability assessment

2.2.2) The SAHRA 2009 MPD & SAHRIS

A number of archaeological Cultural Resources Management (CRM) project reports are recorded in the SAHRA 2009 Mapping Project Database (MPD), situated within an approximate 30km radius from the proposed *Residential Development – Farm RE/1234, Gonubie*, study site, listed as:

- Binneman, J. (Albany Museum). 2005. *Archaeological Heritage Impact Assessment for the proposed Gqunubie Valley Golf Estate.*
- Binneman, J. & Webley, L.E. (Albany Museum). 1996. *Proposed Eastern Cape Zinc and Phosphoric Acid Project: Baseline Report: Sensitivity of Cultural Sites.*
- Coetzee, F.P. (UNISA). 2008. *Cultural Heritage Survey for Nungu Trading 672 (Pty) Ltd Prospecting Application, East London, Eastern Cape.*
- Van Ryneveld, K. (ArchaeoMaps). 2007. *Phase 1 Archaeological Impact Assessment: Mnt. Coke Eco-residential and Golf Estate, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008a. *Phase 1 Archaeological Impact Assessment: Proposed Pipeline, Portion of Farm 1008, Winterstrand, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008b. *Phase 1 Archaeological Impact Assessment: Hotel and Conference Center Development, Portion 2 of Farm 992, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008c. *Phase 1 Archaeological Impact Assessment: Cove Rock Golf Estate, Cove Rock, East London, Eastern Cape, South Africa.*

- Van Ryneveld, K. (ArchaeoMaps). 2008d. *Letter of Recommendation: Exemption from a Phase 1 Archaeological Impact Assessment (AIA) for the Beachfront adjoining the Cove Rock Golf Estate and Hotel and Conference Center Development, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008e. *Phase 1 Archaeological Impact Assessment: Residential Development, Portions 1 & 4 of Farm 1245, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008f. *Phase 1 Archaeological Impact Assessment: Residential Development, Farm 960, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008g. *Phase 1 Archaeological Impact Assessment: Rezoning and Subdivision for Mixed-use Development, Farm 939, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008h. *Phase 1 Archaeological Impact Assessment: Warehousing and Light Industrial Development, Farm 922, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008i. *Phase 1 Archaeological Impact Assessment: Development of a Shopping Mall and Commercial Offices, Portions 21, 22, 23 of Farm 925, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008j. *Phase 1 Archaeological Impact Assessment: Warehouse and Related Infrastructure, Portion 19 of Farm 925, Cove Rock, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008k. *Phase 1 Archaeological Impact Assessment: Industrial Development, Erven 17532 & 49336, Orange Grove, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008l. *Phase 1 Archaeological Impact Assessment: Retail and Residential Development, Portions 3 & 5 of Farm 1234, Gonubie, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008m. *Phase 1 Archaeological Impact Assessment: Riverleigh Township Development, Farm 817/3, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2008n. *Phase 1 Archaeological Impact Assessment: Residential Development, Portions 3, 4 & 18 of Farm 807, Quenera, East London, Eastern Cape, South Africa.*
- Van Schalkwyk, L.O. (eThembeni). 2008. *Heritage Impact Assessment of the proposed N2 Wild Coast Toll Highway, Eastern Cape and KwaZulu-Natal, South Africa.*
- Webley, L.E. & Vernon, G. (Albany Museum). 2008. *Phase 1 Heritage Impact Assessment. The Construction of a Dual Carriageway linking Fitzpatric Road and Currie Street on the 'Sleeper Site', Erf 15835, Buffalo City, Eastern Cape.*

Additional archaeological CRM studies situated within the mentioned proximity to the *Residential Development – Farm RE/1234, Gonubie*, study site available on SAHRIS, include, but are not necessarily limited to:

- Anderson, G. (Umlando). 2009. *Heritage Survey of the Marine Aquaculture Zone, East London Industrial Development Zone*;
- Anderson, G. (Umlando). 2010. *Comment on the East London Foreshore Reclamation Project.*
- Anderson, G. (Umlando). 2011a. *Heritage Survey of the Proposed Ikwezi 10MW PV Solar Energy Facility*;
- Anderson, G. (Umlando). 2011b. *Heritage Survey of the Reinstatement of the East London Port Foreshore*;
- Binneman, J. (ECHC). 2011. *A Letter of Recommendation (with Conditions) for the Exemption of a Full Phase 1 Archaeological Impact Assessment for the Proposed Establishment of 12 Holiday Homes on Portion 3 of Farm 695, (Clippety Clop), adjacent to the Kwelera River, Great Kei Municipality, Eastern Cape Province.*
- Binneman, J. & Webley, L.E. (Albany Museum). 1996. *Proposed Eastern Cape Zinc and Phosphoric Acid Project: Baseline Report: Sensitivity of Cultural Sites.*
- Minkley, G. (University of Fort Hare). 2008. *Heritage Survey: Phase 1 Heritage Impact Assessment for the Proposed Atterbury Mixed-Use Development, Gonubie*.
- Van Ryneveld, K. (ArchaeoMaps). 2009a. *Phase 1 Archaeological Impact Assessment – Subdivision and Residential Developments, Farm 724/7, Kwelera, East London, Eastern Cape, South Africa*.
- Van Ryneveld, K. (ArchaeoMaps). 2009b. *Phase 1 Archaeological Impact Assessment – Queenspark Substation and Power Line, East London, Eastern Cape, South Africa*.
- Van Ryneveld, K. (ArchaeoMaps). 2010a. *Phase 1 Archaeological Impact Assessment – Consolidation and Rezoning of Farm 640/01 and Farm 640/29, East London, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2010b. *Addendum to the Phase 1 Archaeological Impact Assessment: Queenspark Substation and Powerline, East London, Eastern Cape, South Africa.*

- Van Ryneveld, K. (ArchaeoMaps). 2012. *Phase 1 Archaeological Impact Assessment – Oxford Harbor View Development, Erven 15833, 15834, 15835 and 33367, East London, Eastern Cape, South Africa*.
- Van Ryneveld, K. (ArchaeoMaps). 2014a. *Phase 1 Archaeological Impact Assessment – Final Report. Buffalo Bridge Replacement, East London, Eastern Cape, South Africa*.
- Van Ryneveld, K. (ArchaeoMaps). 2014b. *Phase 1 Archaeological Impact Assessment – Upgrade and Expansion of the Cefane Mouth Holiday Resort, Portion of Farm RE/458 East London (near Chintsa), Eastern Cape, South Africa*.
- Van Ryneveld, K. (ArchaeoMaps). 2014c. *Phase 1 Archaeological Impact Assessment – Proposed Construction of the Needs Camp / Potsdam Bridge and Access Road, (near East London), BCMM, Eastern Cape, South Africa.*
- Van Ryneveld, K. (ArchaeoMaps). 2014d. *Phase 1 Archaeological Impact Assessment – Proposed Utilization of the Needs Camp / Potsdam Borrow Pit [NCP_BP01], (near East London), BCMM, Eastern Cape, South Africa.*

2.2.3) SAHRA Provincial Heritage Site Database – Eastern Cape

Geo-referenced declared Provincial Heritage Sites (PHS) recorded in the SAHRA – Eastern Cape database indicates a spatial distribution clustered around the Buffalo River Mouth and the East London harbor, with a single site, as listed, situated within approximately 5km from the proposed *Residential Development – Farm RE/1234, Gonubie,* study site.

Map 4: Spatial distribution of geo-referenced PHS in the Eastern Cape in relation to the study site

Declared Provincial Heritage Sites – Eastern Cape					
Map Ref	**Identifier**	**Site Name**	**Town**	**NHRA status**	**Coordinates**
BE-EC83	9/2/026/0028	Red House, Red House Avenue, East London [Fine example of Mediterranean type mansion from the 2nd decade of the 20th Century.]	East London	Provincial Heritage Site	S32°59'01"; E27°55'00"

Table 4: Declared Provincial Heritage Sites in relation to the study site

2.2.4) General Discussion

Selected of the above listed reports and additional literature resources were consulted for purposes of a basic integrated background discussion on the more immediate receiving cultural environment of the *Residential Development – Farm RE/1234, Gonubie*, study site:

Hominin / Human Evolution and the Stone Age: No Earlier Stone Age (ESA) sites were identified in any of the consulted CRM reports, aside from a single handaxe reported on by Van Ryneveld (2010a). Van Ryneveld (2014c) reported on a low density, in section ESA and Middle Stone Age (MSA) occurrence from the Needs Camp / Potsdam area and Anderson (2011a) documented both MSA and LSA artefact scatters within the Ikwezi Solar Energy study site. Anderson's discovery of MSA artefact occurrences are in accordance with MSA hominin evidence: The Nahoon footprints site, where hominin / human footprints dating to 200,000BP have been discovered, is situated approximately 10km east north-east of the study site (www.eastlondon.org.za/nahoon_footprints.html), while of the earliest *Homo Sapien Sapien*, or modern human remains, dating to 125,000BP, are known from Klasies River Mouth along the south coast of the Eastern Cape (www.modernhumanorigins.net/klasies.html). Evidence of LSA (including both hunter-gatherer and pastoralist) occupation of the East London area seems fairly ample: The presence of deflated coastal shell middens were reported on by Binneman & Webley (1996). Anderson (2009) identified no less than 7 LSA shell midden sites during his East London IDZ survey. In addition an ephemeral shell scatter situated approximately 2.5-3km inland, on the banks of the Buffalo River, was reported on (Van Ryneveld 2010b). The proposed *Residential Development – Farm RE/1234, Gonubie,* study site is situated within 3km from the coastline and bordering the Qinira River, placing it directly within the approximate 5km 'sensitive' zone where shell middens may be expected to occur and along a sensitive environment where the still, CRM and research, much eluded prehistoric presence and use of fresh water resources may be evidenced.

The Iron Age: Canasta Place, situated approximately 15-20km west of East London still constitutes the southern-most known EIA site in South Africa (Nongwasa 1994). From the late 1500's / early 1600's increasing numbers of LIA Nguni people moved south, into the Eastern Cape, as a result of Zulu tribal warfare and the resultant Mfecane. These people, today collectively referred to as the Xhosa, largely displaced resident KhoiSan groups (Mitchell 2002), though instances of incorporation, either forced or by choice are also recorded. From the late 1600's conflict between migrants from the Cape (predominantly Boers) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Anderson (2011a) reported on 3 stone cairns or '*izivivane*'. However, he is of the opinion that these may perhaps represent graves. In his pre-feasibility assessment of the Ikwezi Solar Energy project he consulted 1959 topographic maps, indicating that settlements were then recorded in the area. The most prominent CRM reported on LIA site remains the Cove Rock intangible heritage site, situated south of the Buffalo River (Coetzee 2008, Van Ryneveld 2008b, 2008c, 2008e, 2008g, 2008h, 2008i, 2008j). The site is closely tied with the history of Nongqawuse, the young Xhosa prophetess who in 1856 prophesized the '*Cattle Killing*' (1856-1857) to ensure expulsion of the white man from Xhosa territory. The '*Cattle Killing*' resulted in the deaths of more than 40,000 Xhosa and over 400,000 of their cattle. It is believed that the Cove Rock site was an important place where cattle were ordered to be chased off the cliffs by Xhosa 'seers' to meet the demands of the ancestors. The '*Cattle Killing*' is believed by many to have been the major event that resulted in the Xhosa becoming a 'wage-paid labor nation' to the Colony (Milton 1983). Following the '*Cattle Killing*' various African locations and reserves were established to accommodate, on their return, the '*loyal natives*' – African 'followers' who had 'sought work in the Colony', under Sir George Grey's (Governor and High Commissioner of the Cape Colony) instructions. Grey's idea was that these '*loyal natives*' would provide a 'buffer zone' alongside European settlers between the independent African chiefdoms and the Settler Colony, with the House of Phalo (Gqaleka and Rharhabe) representing the major independent African groups in the vicinity west of the Kei (Peires 1981).

The Colonial Period: British military need for a reliable harbor along the eastern frontier was evident as early as the 1830's, but became more pressing in 1835 after Governor Sir Benjamin D'Urban proclaimed the area between the Keiskamma and the Buffalo Rivers as the Province of Queen Adelaide. In 1836 a favorable survey of the Buffalo River mouth was made and the area immediately named Port Rex – but the Province was never annexed to the Cape and plans to develop the harbor abandoned. During the 7th Frontier War (War of the Axe, 1846-1847) a 2nd favorable report on the

Buffalo River mouth was made; this time plans for its use were implemented. In 1847 a post, known as Fort Buffalo, was built on the West Bank of the river and in 1848 the new Governor, Sir Harry Smith, annexed the port and surrounding territory to the Cape Colony, naming it East London. Smith also established a 2nd more substantial fort, Fort Glamorgan, named after Col. Henry Somerset, eldest son of Lord Charles Somerset and commander of British troops on the eastern frontier from 1819-1852. A stone jetty was built in 1848 and by 1849 at least 4 streets were laid out. By the mid 1850's the village had a population of 124 European settlers and 300 troops. From 1857 onwards many of the members of the British German Legion, settled in British Kaffraria, took up residence in East London. 1873 saw the 3 villages clustered around the Buffalo River mouth, East London West Bank, East London East Bank and Panmure (after Lord Panmure) merged into a single municipality. Construction on the main harbor began in 1872 and in 1873 work started on the breakwater (http://www.sahistory.org.za/places/east-london).

Minkley (2008) briefly sketches the Colonial Period cultural environment of the greater East London area stating that from the 1850's onwards German and other European settlers increasingly settled on farms of various allotments, from the Fish to the Buffalo and beyond the Kei River; a period commonly referred to as the '*grantee settlements*'. Larger allotments approximated 1,500 acres, set aside for grazing and dairy farming. From 1876 allotments were broken up in smaller pieces, often used as orchards and for vegetable and timber farming. By the 1890's when another spate of further land apportionment occurred, most of the land-use and settlement patterns including un-alienated coastal forest strips, such as the zone between the Buffalo and the Kei Rivers, had been consolidated on what had largely been unoccupied or non-permanently settled African land.

Known Colonial Period resources are ample, primarily clustered in the vicinity of the East London harbour, and reported on by Van Ryneveld (2007, 2009b, 2010a, 2012, 2014a, 2014b) and Webley & Vernon (2008).

Grave and Cemetery Sites: Van Ryneveld (2008b) reported on a contemporary known grave, but of unknown locality – a cautionary note to developers that unmarked graves may be encountered during the course of development and supplementing the current record of identified grave sites (Anderson 2011a; Van Ryneveld 2007).

Shipwrecks: The following shipwrecks are recorded along the East London coastline, roughly from the Kei River mouth in the north to Kaysers' Beach in the south (http://sashipwrecks.com):
Agnes (1948), Albert Edward Prince of Wales (1882), Albert Juhl (1876), Alfred (1866), Alma (1878), Amatola (1852), Andreas (1928), Ann Staniland (1876), Ann Hutchinson (1942), Annie S (1875), Antonie (1864), Asphodel (1878), Atbara (1902), Aurora (1902), Bierstadt (1877), Blesbok (1971), Bonanza (1894), Brighton (1881), Caledonian (1905), Campyne (1874), Cape St. Francis (1963), Carl Zu Den Drei Greiffen (1875), Carrie Wyman (1886), Castor (1851), Cichina (1873), City of Johannesburg (1942), Clansman (1882), Clymping (1881), Colombia (1942), Columbia (1880), Campage (1874), Constantia (1868), Coquette (- Campage) (1874), Countess of Dudley (1877), Crixea (1872), Crusader (1868), Danashe (1945), Dauntless (1883), Die Heimath (1881), Early Morn (1863), Eda (1904), Elaine (1872), Elise (1878), Elise Linck (1902), Eliza (1880), Elizabeth (1839), Elizabeth Mary (1861), Ellen Browse (1877), Elmira (1876), Elphida (1893), Elsie May (1883), Emile Marie (1874), Emma (1872), Emma (1880), Euterpe (1876), Excello (1942), Fingoe (1874), Flora (- Florie) (1874), Foam (1851), Francisca (1882), Frontier III (1957), General Nott (1876), Ham 79 (1924), Ham 81 (1924), Hampton Court (1881), Helene (1905), Henry Douse (1867), Herma (1855), Hohenzallern (1876), Hope (1880), Huma (1855), Imogen (1867), Jacaranda (1971), James Gibson (1874), Jane Davies (1872), Johan (1882), Kaffir (1890), Kaffit Chief (1876), Kathleen Anderson (1903), Kensington (1900), Khedive (1910), King Cadwallon (1929), Koodoo (1960), K.G. Meldahl (1942), La Serena (1876), Lady Kennaway (1857), Leif (1896), Lily of Cape Town (1894), Lizzie (1885), Llannashe (1943), Lochett (1884), Lockett (1884), Lord of the Isles (1873), Louise (1891), Lucy (1895), Lunaria (1861), Madagascar (1858), Maid of Arron Marengo (1876), Margaret A (1972), Maron Neil (1885), Martha (1872), Mary (1960), Mary Anne (1966), Medusa (1863), Memento (1876), Momento (1875), M.M. Jones (1876), Nant-y-glo (1872), Natal Star (1874), New Blessing (1905), Nossa Senhora de Atalaia do Pinheiro (1647), Nova Bella (- Nuovo Abele) (1874), Nundeeps (1868), Olive (1900), Olive (1878), Ondes (1901), Orient (1907), Orient (1970), Palatina (1911), Papa Risetto (1888), Philippine Leader (1973), Pioneer (1902), Plettenberg (1948), Pondo (1902), Quanza (1872), Queen of Mary (1872), Queen of Nations (1889), Queen of the Deep (1867), Refuge (1872), Rosehall (1876), Rubicon (1989), Sandvik (1888), Sao Joao Baptista (1622), Sarah Phillips (1871), Schermbrucker (1964), Schmayl (1883), Sea Rover (1868), Sea Wave (1879), Seafield (1882), Shantung (1868), Sharp (1872), Shrimp (1861), Sierra Palma (1883), South Easter (1872), St. Agnes (1955),

Star Beam (1880), Star of the East (1905), Stralenburg (1970), Stuart Star (1937), Success (1970), S.A. Oranjeland (1974), Therese (1861), Thode Fagelund (1941), TMP Sagattarius (2002), Triton (1905), Valdivia (1908), Verulam (1874), Vigilant (1853), Waratah (1909), Western Star (1874) and Wild Rose (1872).

2.3.1) Field Assessment Results

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the field assessment for the *Residential Development – Farm RE/1234, Gonubie*, study site. Vegetation at the site proved thick, not only obscuring visibility but access to the majority of the study site. Assessment in accessible areas did not yield any heritage surface resources or indicators of possible subsurface sites or occurrences. Inspected sections of the Qinira River echoed the general anthropogenic sterility of the site. More open areas towards the south of the site, with open vegetation in this area the probable result of former disturbance for farming purposes (NS Environmental 2014) indicated anthropogenic sterile churned settled surfaces, at least a preliminary indicator that large scale cultural members are not present to an estimated depth of 40-50cm, at least towards the south of the study site.

Despite the fact that no heritage resources were identified during the field assessment for the *Residential Development – Farm RE/1234, Gonubie*, study site, the fact that vegetation not only obscured visibility but also access across large parts of the site, coined with the locality of the site, situated within the 5km 'sensitive' zone where shell midden sites can reasonably be expected, the possibility of archaeological and cultural heritage resources being encountered during the course of development, most possibly during phases of vegetation clearing, earth moving and trench excavation, cannot be excluded. In the event of any archaeological and cultural heritage resources being encountered during the course of construction, it is recommended that the procedure as described in the '*Heritage Protocol for Incidental Finds during the Construction Phase*' be followed.

Map 5: Results of the field assessment for the *Residential Development – Farm RE/1234, Gonubie*, study site (tracklog – white)

Plate 1: General view of the *Residential Development – Farm RE/1234, Gonubie* [1]

Plate 3: Sloped surface exposures at the study site

Plate 2: General view of the *Residential Development – Farm RE/1234, Gonubie* [2]

Plate 4: View of the dumping site towards the west of the study site

3 - Environmental Impact Assessment Rating

Identified archaeological and cultural heritage sites are ascribed an Environmental Impact Assessment (EIA) rating, based on the extent or spatial scale of the impact [E] (0 = None, 1 = Site specific, 2 = Local, 3 = Regional, 4 = National and 5 = International), the magnitude of the impact, positive or negative [M+ / M-] (0 = Zero, 2 = Very low, 4 = Low, 8 = High and 10 = Very high), the duration of the impact [D] (1 = Immediate, 2 = Short term, 3 = Medium term, 4 = Long term and 5 = Permanent), the probability of the occurrence [P] (1 = Improbable, 2 = Low probability, 3 = Medium probability, 4 = High probability and 5 = Definite), the irreplaceable loss of resources [I] (0 = None; 1 = Very low, 2 = Low, 3 = Moderate, 4 = High, 5 = Definite), the reversibility of potential impacts [R] (0 = No impact, 1 = Impact will be reversible; 2 = High potential for reversibility; 3 = Moderate potential for reversibility; 4 = Low potential for reversibility; 5 = Impact cannot be reversed) and cumulative impact (None, Low, Medium and High). A site significance point [SP] is assigned as follows:

- SP = (M + D + E + I + R) x P.

A maximum of 150 SP can be assigned to an impact. Environmental Significance [S] is assigned based on the SP as follows:

- <40 = Low [L];
- 40-74 = Medium [M];
- 75-99 = Medium-High [MH];
- 100-124 = High [H]; and
- 125-150 + Very High [H].

The significance can be either positive [+] or negative [-]. An impact of low [L] is likely to contribute to either + or – decisions about whether or not to proceed with the development, with little real effect and is unlikely to have an influence on project design or alternative motivation. An impact of M implies that if unmanaged could influence a decision on whether or not to proceed with development. An impact of MH is similar to M, with caution to mitigation options and alternative mitigation options should be investigated where possible. An impact of H could influence a decision about whether or not to proceed with development, regardless of available mitigation options and an impact of VH implies that a project cannot proceed and that impacts are irreversible, regardless of available mitigation options.

Environmental impact assessment ratings are grouped per sites with the same basic recommendation per site type or type of impact, with cognizance to the fact that impacts on heritage sites are as a norm irreversible (heritage sites are non-renewable resources) and with reference to the SAHRA (2007) prescribed mitigation options per site significance rating, weighed against development / possible natural impact.

Environmental Impact	Site Number	Environmental Significance																	
		Before Mitigation									After mitigation								
		M	D	E	I	R	P	SP	S	C	M	D	E	I	R	P	SP	S	C
N/A	Sites: N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Comment: N/A																		
	Summary of mitigation points: N/A																		

Table 5: Environmental significance assessment of identified heritage sites for the *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape – Not applicable

4 - Recommendations

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape, proceeds as applied for without the developer having to comply with additional heritage compliance requirements prior to commencement of construction.

- No archaeological or cultural heritage developmental 'fatal flaws' identified;
- No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, identified during the field assessment;
- [Should any incidental archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, be encountered during the course of development the process described in the '*Heritage Protocol for Incidental Finds during the Construction Phase*' should be followed.]

The EC PHRA APM Unit HIA Comment will state legal requirements for development to proceed, or reasons why, from a heritage perspective, development may not be further considered.

Archaeological and Basic Cultural Heritage Compliance Summary – *Residential Development – Farm RE/1234, Gonubie,* East London, BCMM, Eastern Cape			
Map Code	**Site**	**Co-ordinates**	**Recommendations**
***Residential Development – Farm RE/1234, Gonubie,* East London, BCMM, East London**			
-	Residential Development – Farm RE/1234, Gonubie	S32°56'54.8"; E27°57'22.3"	**N/A**

Table 6: Archaeological and cultural heritage compliance summary for the proposed *Residential Development – Farm RE/1234, Gonubie*, East London, BCMM, Eastern Cape

Notes:

- Should any registered Interested & Affected Party (I&AP) wish to be consulted in terms of Section 38(3)(e) of the NHRA 1999 (Socio-cultural consultation / SAHRA SIA) it is recommended that the developer / EAP ensures that the consultation be prioritized within the timeframe of the environmental assessment process.

Simplified guide to the identification of archaeological sites:

- **Stone Age** – Knapped stone display flakes that appear unnatural and may result in similar type 'shaped' stones often concentrated in clusters or forming a distinct layer in the geological stratigraphy. ESA shapes may represent 'pear' or oval shaped stones, often in the region of 10cm in length or larger. Typical MSA types include blade-like or triangular shaped stones often associated with randomly shaped stones that display use or edge-wear around the rim of the artefact. LSA types may well be small, informally shaped stones, often associated with bone, pieces of charcoal and in cases ceramic shards.

  Rock Art – Includes both painted and engraves images.

  Shell Middens – Include compact shell lenses that may be quite extensive in size or small ephemeral scatters of shell food remains, often associated with LSA artefact remains, but may also be of MSA and Iron Age cultural association.
- **Iron Age** – Iron Age sites are often characterized by stone features, i.e. the remains of former livestock enclosures or typical household remains, huts are often identified by either mound or depression hollows. Typical artefacts include ceramic remains, farming equipment, beads and trade goods, metal artefacts (including jewelry) etc. Remains of the 'Struggle' – events, histories and landmarks associated therewith are often, based on cultural association, classed as part of the Iron Age heritage of South Africa.
- **Colonial Period** – Built environment remains, either urban or rural, are of a western cultural affiliation with typical artefacts representing early western culture, including typical household remains, trade and manufactured goods, such as old bottles, porcelain and metal artefacts. War memorial remains including the vast array of associated graves and the history of the Industrial Revolution form important parts of South Africa's Colonial Period heritage.

5 - Acronyms and Abbreviations

AD	: Anno Domini (the year 0.)
AIA	: Archaeological Impact Assessment
AMAFA	: Amafa aKwaZulu-Natali
ASAPA	: Association of Southern African Professional Archaeologists
BAR	: Basic Assessment Report
BC	: Before the Birth of Christ (the year 0.)
BCE	: Before the Common Era (the year 0.)
BIA	: Basic Impact Assessment
BID	: Background Information Document
BP	: Before the Present (the year 1950.)
cm	: Centimeter
CRM	: Cultural Resources Management
DAC	: Department of Arts and Culture
DEAT	: Department of Environmental Affairs and Tourism
DEDEAT	: Department of Economic Development, Environmental Affairs and Tourism
DME	: Department of Minerals and Energy
DSACR	: Department of Sport, Arts, Culture and Recreation
ECO	: Environmental Control Officer
EAP	: Environmental Assessment Practitioner
EC PHRA	: Eastern Cape Provincial Heritage Resources Authority
EIA	: Environmental Impact Assessment
EIA_1	: Early Iron Age
EMPr	: Environmental Management Plan report
ESA	: Earlier Stone Age
ha	: Hectare
HIA	: Heritage Impact Assessment
HWC	: Heritage Western Cape
HCMP	: Heritage Conservation Management Plan
ICOMOS	: International Council on Monuments and Sites
IEM	: Integrated Environmental Management
km	: Kilometer
Kya	: Thousands of years ago
LIA	: Later Iron Age
LSA	: Later Stone Age
m	: Meter
m^2	: Square Meter
MIA	: Middle Iron Age
mm	: Millimeter
MPRDA (2002)	: Mineral and Petroleum Resources Development Act, No 28 of 2002
MSA	: Middle Stone Age
Mya	: Millions of years ago
NEMA (1998)	: National Environmental Management Act, No 107 of 1998
NHRA (1999)	: National Heritage Resources Act, No 25 of 1999
PIA	: Palaeontological Impact Assessment
PHRA	: Provincial Heritage Resources Authority
PSSA	: Palaeontological Society of South Africa
PPP	: Public Participation Process
SAHRA	: South African Heritage Resources Agency
SAHRIS	: South African Heritage Resources Information System
ScIA	: Socio-cultural Impact Assessment
SIA	: Social Impact Assessment

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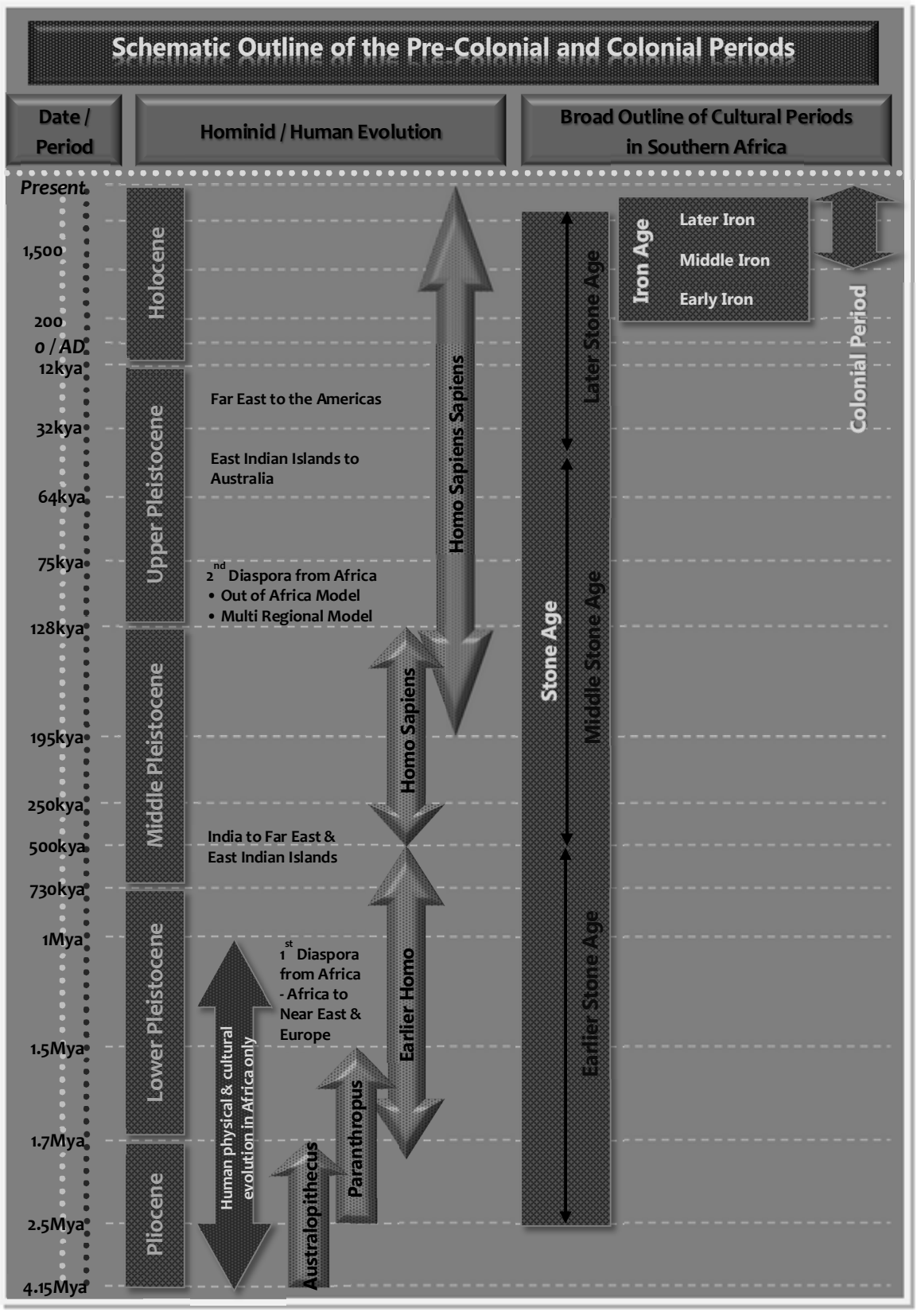
Appendix A:


Schematic Outline of the Pre-Colonial and Colonial Periods
Date / Period
Hominid / Human Evolution
Broad Outline of Cultural Periods in Southern Africa
Present
1,500
200
0 / AD
12kya
32kya
64kya
75kya
128kya
195kya
250kya
500kya
730kya
1Mya
1.5Mya
1.7Mya
2.5Mya
4.15Mya
Holocene
Upper Pleistocene
Middle Pleistocene
Lower Pleistocene
Pliocene
Far East to the Americas
East Indian Islands to Australia
2nd Diaspora from Africa
• Out of Africa Model
• Multi Regional Model
India to Far East & East Indian Islands
1st Diaspora from Africa - Africa to Near East & Europe
Human physical & cultural evolution in Africa only
Homo Sapiens Sapiens
Homo Sapiens
Earlier Homo
Paranthropus
Australopithecus
Stone Age
Later Stone Age
Middle Stone Age
Earlier Stone Age
Iron Age
Later Iron
Middle Iron
Early Iron
Colonial Period

Appendix B:

Introduction to the Archaeology of South Africa

Archaeologically the southern African cultural environment is roughly divided into the Stone Age, the Iron Age and the Colonial Period, including its subsequent Industrial component. This cultural division has a rough temporal association beginning with the Stone Age, followed by the Iron Age and the Colonial Period. The division is based on the identified primary technology used. The hunter-gatherer lifestyle of the Stone Age is identified in the archaeological record through stone being the primary raw material used to produce tools. Iron Age people, known for their skill to work iron and other metal, also practiced agriculture and animal husbandry. Kingships and civilizations associated with the Iron Age are indicative of a complex social hierarchy. The Colonial Period is marked by the advent of writing, in southern Africa primarily associated with the first European travelers (Mitchell 2002).

During the latter part of the Later Stone Age (LSA) hunter-gatherers shared their cultural landscape with both pastoralists and Iron Age people, while the advent of the Colonial Period in South Africa is marked by a complex cultural mosaic of people; including LSA hunter-gatherers, pastoralists, Later Iron Age farming communities and Colonial occupation.

1) Early Hominin Evolution

DNA studies indicates that humans and chimpanzees shared a common ancestor between 6-8Mya (Sibley & Ahlquist 1984). By 4Mya, based on fossil evidence from Ethiopia and Kenya, hominins (humans and their immediate fossil ancestors and relatives) had already evolved. The earliest fossils are ascribed to *Ardipithecus ramidus* (4.4Mya), succeeded by *Australopithecus anamensis* (4.2-3.9Mya). These fossils are inferred to lie at the base from which all other hominins evolved (Leakey *et al.* 1995; White *et al.* 1994).

In South Africa the later hominins are classed into 3 groups or distinct genera; *Australopithecus* (gracile australopithecines), *Paranthropus* (robust australopithecines) and *Homo.* South Africa has 3 major hominin sites: Taung in the North-West Province, where Raymond Dart identified the first *Australopithecus* fossil in 1924 (Dart 1925); The Cradle of Humankind (Sterkfontein Valley) sites in Gauteng, the most prolific hominin locality in the world for the period dating 3.5-1.5Mya which have yielded numerous *Australopithecus, Paranthropus* and limited *Homo* fossils (Keyser *et al.* 2000; Tobias 2000); and Makapansgat in the Limpopo Province, where several more specimens believed to be older than most of the Cradle specimens were discovered (Klein 1999).

A. africanus, represented at all 3 sites are believed to have been present on the South African landscape from about 3Mya. From approximately 2.8Mya they shared, at least in the Cradle area, the landscape with *P. robustus* and from roughly 2.3Mya with early forms of *Homo* (Clarke 1999). Global climatic cooling around 2.5Mya may have stimulated a burst of species turnover amongst hominins (Vrba 1992); the approximate contemporary appearance of the first stone tools suggests that this was a critical stage in human evolution. But exactly which early hominin population is to be accredited as the ancestor of *Homo* remains elusive.

H. ergaster is present in the African palaeo-anthropological record from around 1.8Mya and shortly thereafter the first exodus from Africa is evidenced by *H. erectus* specimens from China, Indonesia and even Europe (Klein 1999).

2) The Stone Age

2.1) The Earlier Stone Age

In South Africa the only Earlier Stone Age (ESA) Oldowan lithic assemblage comes from Sterkfontein Cave. The predominant quartz assemblage is technologically very simple, highly informal and inferred to comprise exclusively of multi-purpose tools (Kuman *et al.* 1997). The latter part of the ESA is characterized by the Acheulean Industrial Complex, present in the archaeological record from at least 1.5Mya. Both *H. ergaster* and *P. robustus* may be accredited with the production of these tools. The association between stone tools and increased access to meat and marrow supporting the greater dietary breath of *Homo* may have been vital to *Homo's* evolutionary success; and the eventual extinction of the robust australopithecines (Klein 1999).

Probably the longest lasting artefact tradition ever created by hominins, the Acheulean is found from Cape Town to north-western Europe and India, occurring widely in South Africa. Despite the many sites it is still considered a '*prehistoric dark age*' by many archaeologists, encompassing one of the most critical periods in human evolution; the transition from *H. ergaster* to archaic forms of *H. Sapiens* (Klein 1999).

The Acheulean industry is characterized by handaxes and cleavers as *fosilles directeurs* (signatory artefact types), in association with cores and flakes. Handaxes and cleavers were multi-purpose tools used to work both meat and plant matter (Binneman & Beaumont 1992). Later Acheulean flaking techniques involved a degree of core preparation that allowed a single large flake of predetermined shape and size to be produced. This *Victoria West technique* indicates an origin within the Acheulean for the *Levallois technique* of the Middle Stone Age (Noble & Davidson 1966). The lithic artefact component was supplemented by wood and other organic material (Deacon 1970).

2.2) The Middle Stone Age

The Middle Stone Age (MSA), dating from approximately 500kya to 40-27/23kya is interpreted as an intermediate technology between the Acheulean and the Later Stone Age (LSA) (Goodwin & van Riet Lowe 1929). The MSA is typologically characterized by the absence of handaxes and cleavers, the use of prepared core techniques and the production of blades, triangular and convergent flakes, with convergent dorsal scars and faceted striking platforms, often produced by means of the *Levallois technique* (Volman 1984). The widespread occurrence of MSA technology across Africa and its spread into much of Eurasia in Oxygen Isotope Stage (OIS) 7 is viewed as part of a process of population dispersal associated with both the ancestors of the later Neanderthals in Europe and anatomically modern humans in Africa (Foley & Lahr 1997).

After the riches offered by the Cradle sites and Makapansgat, southern Africa's Middle Pleistocene fossil record is comparatively poor. Early Middle Pleistocene fossil evidence suggests an archaic appearance and fossils are often assigned to *H. heidelbergensis* and *H. sapiens rhodesiensis* (Rightmire 1976). Modern looking remains, primarily from Border Cave (KwaZulu-Natal) and Klasies River Mouth (Eastern Cape) raised the possibility that anatomically modern humans had, by 120kya, originated south of the Sahara before spreading to other parts of the world (Brauer 1982; Stringer 1985). Subsequent studies of modern DNA indicated that African populations are genetically more diverse and probably older than those elsewhere (Cann *et al.* 1994). Combined, the fossil and genetic evidence underpins the so-called *Out of Africa 2* model (arguing that gene flow and natural selection led regional hominin populations along distinct evolutionary trajectories after *Homo's* expansion from Africa in the Lower Pleistocene *Out of Africa 1* model) of modern human origins and the continuing debate as to whether it should be preferred to its *Multiregional* alternative (arguing that modern humans evolved more or less simultaneously right across the Old World) (Mellars & Stringer 1989; Aitken *et al.* 1993; Nitecki & Nitecki 1994).

Persuasive evidence of ritual activity or bodily decoration is evidenced by the widespread presence of red ochre at particularly MSA 2 sites (after Volman's 1984 MSA 1-4 model; Hensilwood & Sealy 1997), while evidence from Lion Cave, Swaziland, indicates that specularite may have been mined as early as 100kya (Beaumont 1973). Evidence for symbolic behavioral activity is largely absent; no evidence for rock art or formal burial practices exists.

2.3) The Later Stone Age

Artefacts characteristic of the Later Stone Age (LSA) appear in the archaeological record from 40/27-23kya and incorporates micolithic as well as macrolithic assemblages. Artefacts were produced by modern *H. sapien* or *H. sapien sapien*, who subsisted on a hunter-gatherer way of life (Deacon 1984; Mitchell 2002).

According to Deacon (1984) the LSA can temporally be divided into 4 broad units directly associated with climatic, technological and subsistence changes:

1. Late Pleistocene microlithic assemblages (40-12kya);
2. Terminal Pleistocene / early Holocene non-microlithic assemblages (12-8kya);
3. Holocene microlithic assemblages (8kya to the Historic Period); and
4. Holocene assemblages with pottery (2kya to the Historic Period) closely associated with the influx of pastoralist communities into South Africa (Mitchell 2002).

Elements of material culture characteristic of the LSA reflect modern behavior. Deacon (1984) summarizes these as:

1. Symbolic and representational art (paintings and engravings);
2. Items of personal adornment such as decorated ostrich eggshell, decorated bone tools and beads, pendants and amulets of ostrich eggshell, marine and freshwater shells;
3. Specialized hunting and fishing equipment in the form of bows and arrows, fish hooks and sinkers;
4. A greater variety of specialized tools including bone needles and awls and bone skin-working tools;
5. Specialized food gathering tools and containers such as bored stone digging stick weights, carrying bags of leather and netting, ostrich eggshell water containers, tortoiseshell bowls and scoops and later pottery and stone bowls;
6. Formal burial of the dead in graves (sometimes covered with painted stones or grindstones and accompanied by grave goods);
7. The miniaturization of selected stone tools linked to the practice of hafting for composite tools production; and
8. A characteristic range of specialized tools designed for making some of the items listed above.

➢ Rock Art

Rock Art is one of the most visible and informative components of South Africa's archaeological record. Research into LSA ethnography (as KhoiSan history) has revolutionized our understanding of both painted and engraved (petroglyph) images, resulting in a paradigm shift in Stone Age archaeology (Deacon & Dowson 2001). Paintings are concentrated in the Drakensberg / Maluti mountains, the eastern Free State, the Cape Fold Mountains, the Waterberg Plateau and the Soutpansberg mountains. Engravings on the other hand are found throughout the Karoo, the western Free State and North-West Province (Mitchell 2002). Both forms of LSA art drew upon a common stock of motifs, derived from widely shared beliefs and include a restricted range of naturalistically depicted animals, geometric imagery, human body postures and non-realistic combinations of human and animal figures (anthropomorphic figurines). LSA Rock Art is closely associated with spiritual or magical significance (Lewis-Williams & Dowson 1999).

Aside from LSA or KhoiSan Rock Art, thus art produced by both hunter-gatherer and pastoralist and agro-pastoralist groups, Rock Art produced by Iron Age populations are known the be present towards the north of the country.

➢ Shell Middens ('Strandloper' Cultures)

South Africa's nearly 3,000km coastline is dotted by thousands of shell middens, situated between the high water mark and approximately 5km inland, bearing witness to long-term exploitation of shellfish mainly over the past 12,000 years. These LSA shell middens are easily distinguishable from natural accumulations of shells and deposits can include bones of animals eaten such as shellfish, turtles and seabirds, crustaceans like crabs and crayfish and marine mammal remains of seals, dolphins and occasionally whales. Artefacts and hearth and cooking remains are often found in shell midden deposits. Evidence exist that fish were speared, collected by hand, reed baskets and by means of stone fish traps in tidal pools (Mitchell 2002).

Shell midden remains were in the past erroneously assigned to 'Strandloper cultures'. Deacon & Deacon (1999) explain that '*no biological or cultural group had exclusive rights to coastal resources.*' Some LSA groups visited the coast periodically while others stayed year round and it is misleading to call them all by the same name. Two primary sources of archaeological enquiry serves to shed more light on the lifestyles of people who accumulated shell middens, one being the analysis of food remains in the middens itself and the other being the analysis of LSA human skeletal remains of people buried either in shell middens or within reasonable proximity to the coast.

Shell middens vary in character ranging from large sites tens of meters in extent and with considerable depositional depth to fairly small ephemeral collections, easily exposed and destroyed by shifting dune action. Shell middens are also found inland, along rivers where fresh water mussels occur. These middens are often fairly small and less common; in the Eastern Cape often dated to within the past 3,000 years (Deacon & Deacon 1999).

In addition shell middens are not exclusively assigned to LSA cultures; shellfish were exploited during the Last Interglacial, indicating that the practice was most probably continuous for the past 120,000 years (MSA shell middens). Along the coast of KwaZulu-Natal evidence exist for the exploitation of marine food resources by Iron Age communities. These shell middens are easily distinguished from Stone Age middens by particularly rich, often decorated ceramic artefact content. Colonial Period shell middens are quite rare and extremely ephemeral in character; primarily the result of European shipwreck survivors and reported on along the coast of KwaZulu-Natal and the Transkei, Eastern Cape.

3) The Iron Age

For close to 2 millennia people combining cereal agriculture with stock keeping have occupied most of southern Africa's summer rainfall zone. The rapid spread of farming, distinctive ceramics and metallurgy is understood as the expansion of a Bantu-speaking population, in archaeological terms referred to as the Iron Age.

3.1) The Early Iron Age

Ceramic typology is central to current discussions of the expansion of iron using farming communities. The most widely used approach is that of Huffman (1980), who employs a multidimensional analysis (vessel profile, decoration layout and motif) to reconstruct different ceramic types. Huffman (1998) argues that ceramics can be used to trace the movements of people, though not necessarily of specific social or political groupings. Huffman's Urewe Tradition coincides largely with Phillipson's (1977) Eastern Stream. A combined Urewe Tradition / Eastern Stream model for the Early Iron Age can be summarized as:

1. The Kwale branch (extending along the coast from Kenya to KwaZulu-Natal);
2. The Nkope branch (located inland and reaching from southern Tanzania through Malawi and eastern Zambia into Zimbabwe); and
3. The Kalundu branch (strething from Angola through western Zambia, Botswana and Zimbabwe into South Africa).

In southern Africa, recent work distinguishes two phases of the Kwale branch: The earlier Silver Leaves facies (250-430AD) occurring as far south as the Northern Province. The later expression or Mzonjani facies (420-580AD) occurs in the Northern Province a well as along the KwaZulu-Natal coastal belt (Huffman 1998). Since the Silver Leaves facies is only slightly younger than the Kwale type site in Kenya, very rapid movement along the coast, perhaps partly by boat, is inferred (Klapwijk 1974). Subsequently (550-650AD) people making Mzonjani derived ceramics settled more widely in the interior of South Africa.

Assemblages attributable to the Nkope branch appear south of the Zambezi but north of South Africa from the 5th Century. Ziwa represents an early facies, with Gokomere deriving jointly from Ziwa and Bambata. A subsequent phase is represented by the Zhizo facies of the Shashe-Limpopo basin, and by Taukome (Huffman 1994). Related sites occur in the Kruger National Park (Meyer 1988). Zhizo (7th – 10th Century) is ancestral to the Toutswe tradition which persisted in eastern Botswana into the 13th Century.

Kalundu origins need further investigation; its subsequent development is however better understood. A post Bambata phase is represented by the 5th – 7th Century sites of Happy Rest, Klein Africa and Maunatlana in the Northern Province and Mpumalanga (Prinsloo 1974, 1989). Later phases are present at the Lydenburg Heads site (Whitelaw & Moon 1996) and by the succession of Mzuluzi, Ndondonwane and Ntshekane in KwaZulu-Natal (7th – 10th Centuries) (Prins & Grainger 1993). Later Kalundu facies include Klingbeil and Eiland in the northern part of the country (Evers 1980) with Kgopolwe being a lowveld variant in Mpumalanga (10th – 12th Century). Broadhurst and other sites indicate a still later survival in Botswana (Campbell 1991).

Despite the importance accorded to iron agricultural implements in expanding the spread of farming and frequent finds of production debris, metal objects are rare. Metal techniques were simple, with no particular sign of casting, wire drawing or hot working. Jewelry (bangles, beads, pendants etc.) constitute by far the largest number of finds but arrows, adzes, chisels, points and spatulae are known (Miller 1996).

Early Iron Age people were limited to the Miombo and Savannah biomes; excluded from much of the continents western half by aridity and confined in the south during the 1st millennium to bushveld areas of the old Transvaal. Declining summer rainfall restricted occupation to a diminishing belt close to the East Coast and north of S33° (Maggs 1994); sites such as Canasta Place (800AD), Eastern Cape, mark the southern-most limit of Early Iron Age settlement (Nogwaza 1994).

➢ The Central Cattle Pattern

The Central Cattle Pattern (CCP) was the main cognitive pattern since the Early Iron Age (Huffman 1986). The system can be summarized as opposition between male pastoralism and female agriculture; ancestors and descendants; rulers and subjects; and men and women. Cattle served as the primary means of transaction; they represented symbols exchanged for the fertility of wives, legitimacy of children and appeasement of ancestors. Cattle were also used as tribute to rulers confirming sub-ordination and redistribution as loan cattle by the ruler to gain political support. Cattle represented healing and fertilizing qualities (Huffman 1998; Kuper 1980).

This cognitive and conceptual structure underlies all cultural behavior, including the placement of features in a settlement. The oppositions of male and female, pastoralism and agriculture, ancestors and descendants, rulers and subjects, cool and hot are represented in spatial oppositions, either concentric or diametric (Huffman 1986).

A typical CCP village comprise of a central cattle enclosure (byre) where men are buried. The *Kgotla* (men's meeting place / court) is situated adjacent to the cattle enclosure. Surrounding the enclosure is an arc of houses, occupied according to seniority. Around the outer perimeter of the houses is an arc of granaries where women keep their pots and grinding stones (Huffman 1986). The model varies per ethnic group which helps to distinguish ethnicity throughout the Iron Age, but more studies are required to recognize the patterns.

3.2) The Middle Iron Age

The hiatus of South African Middle Iron Age activity was centered in the Shashe-Limpopo Valley and characterized by the 5-tier hierarchical Mapungubwe State spanning some 30,000km^2. By the 1st millennium ivory and skins were already exported overseas, with sites like Sofala and Chibuene, Mosambique, interfacing between interior and transoceanic traders. Exotic glass beads, cloth and Middle Eastern ceramics present at southern African sites mark the beginning of the regions incorporation into the expanding economic system that, partly tied together with maritime trading links across the Indian Ocean, increasingly united Africa, Asia and Europe long before Da Gama or Columbus (Eloff & Meyer 1981; Meyer 1998).

Occupation was initially focused at Bambandanyalo and K2. The Bambananyalo main midden (1030-1220AD) stands out above the surrounding area, reaching more than 6m in places and covering more than 8ha the site may have housed as many as 2,000 people (Meyer 1998). The CCP was not strictly followed; whether this is ideologically significant or merely a reflection of local typography remains unclear. The midden, the size of which may reflect the status of the settlement's ruler, engulfed the byre around 1060-1080AD, necessitating relocation of the cattle previously kept there. The re-organization of space and worldview implied suggests profound social changes even before the sites' abandonment in the early 13th century, when the focus of occupation moved to Mapungubwe Hill, 1 km away (Huffman 1998).

Excavations at Mapungubwe Hill, though only occupied for a few decades (1220-1290AD), yielded a deep succession of gravel floors and house debris (Eloff & Meyer 1981). Huffman (1998) suggests that the suddenness with which Mapungubwe was occupied may imply a deliberate decision to give spatial expression to a new social order in which leaders physically removed themselves from ordinary people by moving onto more inaccessible, higher elevations behind the stone walls demarcating elite residential areas. Social and settlement changes speak of considerable centralization of power and perhaps the elaboration of new ways of linking leaders and subjects.

At Bambandanyalo and Mapungubwe elite burial grave goods include copper, bone, ivory and golden ornaments and beads. Social significance of cattle is reinforced by their importance among the many human and animal ceramic figurines and at least 6 'beast burials' (Meyer 1998).

Today the drought prone Shashe-Limpopo Valley receives less than 350mm of rainfall per annum, making cereal cultivation virtually impossible. The shift to drier conditions in the late 1200's across the Shashe-Limpopo basin and the eastern Kalahari may have been pivotal in the break-up of the Mapungubwe polity, the collapse of Botswana's Toutswe tradition and the emergence of Great Zimbabwe (1220-1550AD), southern Africa's best known and largest (720ha) archaeological site (Meyer 1998).

South of the Limpopo and north of the Soutpansberg, Mapungubwe derived communities survived into the 14th Century, contemporary with the establishment of Sotho-speaking makers of Maloko pottery.

3.3) The Later Iron Age

South African farming communities of the 2nd millennium experienced increased specialization of production and exchange, the development of more nucleated settlement patterns and growing political centralization, albeit not to the same extent as those participating in the Zimbabwe tradition. However, together they form the background to the cataclysmic events of the late 18th / early 19th Century *Mfecane* (Mitchell 2002).

Archaeological evidence of settlement pattern, social organization and ritual practice often differ from those recorded ethnographically. The Moloko ceramic tradition seems to be ancestral to modern Sotho-Tswana speakers (Evers 1980) and from about 1,100AD a second tradition, the Blackburn tradition, appears along South Africa's eastern coastline. Blackburn produced mostly undecorated pottery (Davies 1971), while Mpambanyoni assemblages, reaching as far south as Transkei, includes examples of rim notching, incised lines and burnished ochre slip (Robey 1980). At present, no contemporary farming sites are known further inland in KwaZulu-Natal or the Eastern Cape.

Huffman (1989) argues that similarities between Blackburn and early Maloko wares imply a related origin, presumably in the Chifumbaze of Zambia or the Ivuna of Tanzania, which contains a range of ceramic attributes important in the Blackburn as well as beehive grass huts similar to those made by the Nguni. This is one of the few suggestions of contact between Sotho-Tswana and Nguni speakers on the one hand and farming communities who, if Huffman is correct, were already long established south of the Limpopo. Both ethnographic and archaeological data demonstrate that Sotho-Tswana and Nguni are patrilineal and organize their settlements according to the CCP (Kuper 1980).

From 1,300AD there is increasing evidence for the beginning of agro-pastoralist expansion considerably beyond the area of previous occupation. It is also to this time that the genealogies of several contemporary Bantu speaking groups can be traced (Wilson & Thompson 1969). Associated with this expansion was the regular employment of stone, rather than wood, as building material, an adaptation that has greatly facilitated the discovery and identification of settlements. Maggs (1976) describes 4 basic settlement types all characterized by the use of semi weathered dolorite to produce hard binding *daga* for house floors and a wall building tradition employing larger more regular stones for the inner and outer faces and smaller rubble for the infill. As with the more dispersed homesteads of KwaZulu-Natal and the Eastern Cape, sites tend to be in locally elevated situations, reflecting a deep seated Sotho and Nguni preference for benign higher places rather than supernaturally dangerous riverside localities; another important contrast to both 1st millennium (Maggs 1976) and later Zulu Kingdom settlement patterns (Hall & Maggs 1979).

The lack of evidence for iron production in the interior and eastern part of South Africa emphasize exchange relationships between various groups and associated more centralized polities. By the 19th Century iron production in KwaZulu-Natal was concentrated in particular clans and lineages and associated with a range of social and religious taboos (Maggs 1992). South of Durban comparatively few smelting sites are known (Whitelaw 1991), a trend even more apparent in Transkei (Feely 1987). However, metal remained the most important and archaeologically evident item traded between later farming communities. (Other recorded trade items include glass and ostrich eggshell beads; Indian Ocean seashells; siltstone pipes; *dagga,* and later on tobacco; pigments including ochre, graphite and specularite; hides and salt.)

Rising polity settlements are particularly evident in the north of the country and dated to the 17th Century, including Molokwane, capital of the Bakwena chiefdom (Pistorius 1994) and Kaditshwene, capital of a major section of the Hurutshe, whose population of 20,000 in 1820 almost equals contemporary Cape Town in size (Boeyens 2000). The agglomeration of Tswana settlements in the north of the country was fuelled by both population growth and conflict over access to elephant herds for ivory and long distance trade with the East Coast. During this period ceramic decoration became blander and more standardized than the earlier elaborate decoration that included red ochre and graphite coloring.

The *Mfecane* refers to the wars and population movements of the early 19th Century which culminated in the establishment of the Zulu Kingdom and came to affect much of the interior, even beyond the Zambezi: The late 18th Century was marked by increasing demands for ivory (and slaves) on the part of European traders at Delagoa Bay; as many as 50 tons of ivory were exported annually from 1750-1790. As elephant populations declined, competition increased both for them and for the post 1790 supply of food to European and American whalers calling at Delagoa Bay (Smith 1970). Cattle raiding, conflict over land and changes in climatic and subsistence strategies characterized much of the cultural landscape of the time.

Competition for access to overseas trade encouraged some leaders to replace locally organized circumcision schools and age-sets with more permanently maintained military regiments. These were now used to gain access through warfare to land, cattle and stored food. By 1810 three groups, the Mthethwa, Ndwandwe and Ngwane dominated northern KwaZulu-Natal (Wright 1995). The Mthethwa paramountcy was undermined by the killing of its leader Dingiswayo in *circa* 1818, which led to a brief period of Ndwandwe dominance. In consequence one of Dingiswayo's former tributaries, Shaka, established often forceful alliances with chiefdoms further south. Shaka's Zulu dominated coalition resisted the Ndwandwe who in return fled to Mozambique. As the Zulu polity expanded it consolidated its control over large areas, incorporating many communities into it. Others sought refuge from political instability by moving south of the Thukela River, precipitating a further *domino effect* as far as the Cape Colony's eastern border (Wright 1995).

4) The Colonial Period

In the 15th Century Admiral Zheng He and his subordinates impressed the power of the Ming Dynasty rulers in a series of voyages as far afield as Java, Sri Lanka, southern Arabia and along the East African coast, collecting exotic animals *en route*. But nothing more came of his expeditions and China never pursued opportunities for trade or colonization (Mote 1991).

Portuguese maritime expansion began around the time of Zheng He's voyages; motivated by a desire to establish a sea route to the riches of the Far East. By 1485 Diogo Cao had reached Cape Cross, 3 years later Bartolomeu Dias rounded the Cape of Good Hope and less than a decade later Vasco da Gama called at several places along South Africa's coast, trading with Khoekhoen (Khoi) at Mossel Bay before reaching Mozambique and crossing the ocean to India. His voyage initiated subsequent Portuguese bases from China to Iraq. In Africa interest was focused on seizing important coastal trading towns such as Sofala and gaining access to the gold of Zimbabwe. Following the 1510 Portuguese-Khoekhoen battle at Table Bay, in which the viceroy of India was killed, Portuguese ships ceased to call along the South African coast (Elphick 1985).

A number of shipwrecks, primarily along the eastern coast attest to Portuguese activity including the Sao Joao, wrecked in 1552 near Port Edward and the Sao Bento, destroyed in 1554 off the Transkei coast. Survivors' accounts provided the 1st detailed information on Africa's inhabitants (Auret & Maggs 1982).

By the late 1500's Portuguese supremacy of the Indian Ocean was threatened. From 1591 numerous Dutch and English ships called at Table Bay and in 1652 the Dutch East Indian Company (VOC) established a permanent base, with the intent to provide fresh food and water to VOC ships. In an attempt to improve the food supply a few settlers (free burghers) were allowed to establish farms. The establishment of an intensive mixed farming economy failed due to shortages of capital and labor, and free burghers turned to wheat cultivation and livestock farming. While the population grew slowly the area of settlement expanded rapidly with new administrative centers established at Stellenbosch (1676), Swellendam (1743) and Graaf-Reinet (1785). By the 1960's the Colony's frontier was too long to be effectively policed by VOC officials (Elphick 1985).

From the 1700's many settlers expanded inland over the Cape Fold Mountain Belt. The high cost of overland transport constrained the ability to sell their produce while settlement of the interior was increasingly made difficult by resident KhoiSan groups, contributing due to a lack of VOC military support to growing Company opposition in the years before British control of the Cape (1795 / 1806) (Davenport & Saunders 2000).

In 1820 a major British settlement was implanted on the eastern frontier of the Cape Colony, resulting in large numbers of the community moving into the interior, initially to KwaZulu-Natal, and then after Britain annexed Natal (1843), further into the interior to beyond the Vaal River. Disruptions of the *Mfecane* eased their takeover of African lands and the *Boers* (farmers) established several Republics. A few years later the 2nd South African War saw both the South African and Orange Free State Republics annexed by Britain, a move largely motivated by British desire to control the goldfields of the Witwatersrand. With adjacent regions of the sub-continent also falling, directly or indirectly, under British rule and German colonization of Namibia, European control of the whole of southern Africa was firmly established before the 1st World War (Davenport & Saunders 2000).

➢ Xhosa Iron Age Cultures meets Colonists in the Eastern Cape

From the late 1600's conflict between migrants from the Cape (predominantly Boers) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Both cultures were heavily based and reliant on agriculture and cattle farming. As more Cape migrants, and later settlers from Britain (1820) and elsewhere arrived, population pressures and competition over land, cattle and good grazing became intense. Cattle raiding became endemic on all sides, with retaliatory raids launched in response. As missionaries arrived with evangelical messages, confrontations with hostile chiefs who saw them as undermining traditional Xhosa ways of life resulted in conflicts which flared into wars.

As pressures between the European settlers and the Xhosa grew, settlers organized themselves into local militia, counteracted by Xhosa warring skills: But both sides were limited by the demands of seasonal farming and the need for labor during harvest. Wars between the Boers and the Xhosa resulted in shifting borders, from the Fish to the Sundays River, but it was only after the British annexed the Cape in 1806 that authorities turned their attention to the Eastern

regions and petitions by the settlers about Xhosa raids. British expeditions, in particular under Colonel John Graham in 1811 and later Harry Smith in 1834, were sent not only to secure the frontier against the Xhosa, but also to impose British authority on the settlers, with the aim to establish a permanent British presence. Military forts were built and permanently manned. Over time the British came to dominate the area both militarily and through occupation with the introduction of British settlers. The imposition of British authority led to confrontations not only with the Xhosa but also with disaffected Boers and other settlers, and other native groups such as the Khoikhoi, the Griqua and the Mpondo. The frontier wars continued over a period of about 150 years; from the 1st arrival of the Cape settlers, and with the intervention of the British military ultimately ending in the subjugation of the Xhosa people. Fighting ended on the Eastern Cape frontier in June 1878 with the annexation of the western areas of the Transkei and administration under the authority of the Cape Colony (Milton 1983).

➢ The Industrial Revolution

The Industrial Revolution refers roughly to the period between the 18th - 19th Centuries, typified by major changes in agriculture, manufacturing, mining, transport, and technology. Changing industry had a profound effect on socio-economic and socio-cultural conditions across the world: The Industrial Revolution marks a major turning point in human history; almost every aspect of daily life was eventually influenced in some way. Average income and population size began to exhibit unprecedented growth; in the two centuries following 1800 the world's population increased over 6-fold, associated with increasing urbanization and demand of resources. Starting in the latter part of the 18th century, the transition from manual labor towards machine-based manufacturing changed the face of economic activity; including the mechanization of the textile industries, the development of iron-making techniques and the increased use of refined coal. Trade expansion was enabled by the introduction of canals, improved roads and railways. The introduction of steam power fuelled primarily by coal and powered machinery was underpinned by dramatic increases in production capacity. The development of all-metal machine tools in the first two decades of the 19th century facilitated the manufacture of more production machines in other industries (More 2000).

Effects of the Industrial Revolution were widespread across the world, with its enormous impact of change on society, a process that continues today as 'industrialization'.

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Heritage Impact Assessment (HIA) – Residential Development, Farm RE/1234, Gonubie, East London, BCMM, Eastern Cape

Heritage Protocol for Incidental Finds during the Construction Phase

Should any palaeontological, archaeological or cultural heritage resources, including human remains / graves, as defined and protected by the NHRA 1999, be identified during the construction phase of development (including as a norm during vegetation clearing, surface scraping, trenching and excavation phases), it is recommended that the process described below be followed.

➢ On-site Reporting Process:

1. The identifier should immediately notify his / her supervisor of the find.
2. The identifier's supervisor should immediately (and within 24 hours after reporting by the identifier) report the incident to the on-site SHE / SHEQ officer.
3. The on-site SHE / SHEQ officer should immediately (and within 24 hours after reporting by the relevant supervisor) report the incident to the appointed ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should immediately notify the nearest SAPS station informing them of the find].
4. The ECO / ELO officer should ensure that the find is within 72 hours after the SHE / SHEQ officers report reported on SAHRIS and that a relevant heritage specialist is contacted to make arrangements for a heritage site inspection. [Should the find relate to human remains the ECO / ELO officer should ensure that the archaeological site inspection coincides with a SAPS site inspection, to verify if the find is of forensic, authentic (informal / older than 60 years), or archaeological (older than 100 years) origin].
5. The appointed heritage specialist should compile a 'heritage site inspection' report based on the site specific findings. The site inspection report should make recommendations for the destruction, conservation or mitigation of the find and prescribe a recommended way forward for development. The 'heritage site inspection' report should be submitted to the ECO / ELO, who should ensure submission thereof on SAHRIS.
6. SAHRA / the relevant PHRA will state legal requirements for development to proceed in the SAHRA / PHRA Comment on the 'heritage site inspection' report.
7. The developer should proceed with implementation of the SAHRA / PHRA Comment requirements. SAHRA / PHRA Comment requirements may well stipulate permit specifications for development to proceed.
    - Should permit specifications stipulate further Phase 2 archaeological investigation (including grave mitigation) a suitably accredited heritage specialist should be appointed to conduct the work according to the applicable SAHRA / PHRA process. The heritage specialist should apply for the permit. Upon issue of the SAHRA / PHRA permit the Phase 2 heritage mitigation program may commence.
    - Should permit specifications stipulate destruction of the find under a SAHRA / PHRA permit the developer should immediately proceed with the permit application. Upon the issue of the SAHRA / PHRA permit the developer may legally proceed with destruction of the palaeontological, archaeological or cultural heritage resource.
    - Upon completion of the Phase 2 heritage mitigation program the heritage specialist will submit a Phase 2 report to the ECO / ELO, who should in turn ensure submission thereof on SAHRIS. Report recommendations may include that the remainder of a heritage site be destroyed under a SAHRA / PHRA permit.
    - Should the find relate to human remains of forensic origin the matter will be directly addressed by the SAPS: A SAHRA / PHRA permit will not be applicable.

    NOTE: Note that SAHRA / PHRA permit and process requirements relating to the mitigation of human remains requires suitable advertising of the find, a consultation, mitigation and re-internment / deposition process.

- **Duties of the Supervisor:**

1. The supervisor should immediately upon reporting by the identifier ensure that all work in the vicinity of the find is ceased.
2. The supervisor should ensure that the location of the find is immediately secured (and within 12 hours of reporting by the identifier), by means of a temporary conservation fence (construction netting) allowing for a 5-10m heritage conservation buffer zone around the find. The temporary conserved area should be sign-posted as a '*No Entry – Heritage Site*' zone.
3. Where development has impacted on the resource, no attempt should be made to remove artefacts / objects / remains further from their context, and artefacts / objects / remains that have been removed should be collected and placed within the conservation area or kept for safekeeping with the SHE / SHEQ officer. It is imperative that where development has impacted on palaeontological, archaeological and cultural heritage resources the context of the find be preserved as good as possible for interpretive and sample testing purposes.
4. The supervisor should record the name, company and capacity of the identifier and compile a brief report describing the events surrounding the find. The report should be submitted to the SHE / SHEQ officer at the time of the incident report.

- **Duties of the SHE / SHEQ Officer:**

1. The SHE / SHEQ officer should ensure that the location of the find is recorded with a GPS. A photographic record of the find (including implementation of temporary conservation measures) should be compiled. Where relevant a scale bar or object that can indicate scale should be inserted in photographs for interpretive purposes.
2. The SHE / SHEQ officer should ensure that the supervisors report, GPS co-ordinate and photographic record of the find be submitted to the ECO / ELO officer. [Should the find relate to human remains the SHE / SHEQ officer should ensure that the mentioned reporting be made available to the SAPS at the time of the incident report].
3. Any retrieved artefacts / objects / remains should, in consultation with the ECO / ELO officer, be deposited in a safe place (preferably on-site) for safekeeping.

- **Duties of the ECO / ELO officer:**

1. The ECO / ELO officer should ensure that the incident is reported on SAHRIS. (The ECO / ELO officer should ensure that he / she is registered on the relevant SAHRIS case with SAHRIS authorship to the case at the time of appointment to enable heritage reporting].
2. The ECO / ELO officer should ensure that the incident report is forwarded to the heritage specialist for interpretive purposes at his / her soonest opportunity and prior to the heritage site inspection.
3. The ECO / ELO officer should facilitate appointment of the heritage specialist by the developer / construction consultant for the heritage site inspection.
4. The ECO / ELO officer should facilitate access by the heritage specialist to any retrieved artefacts / objects / remains that have been kept in safekeeping.
5. The ECO / ELO officer should facilitate coordination of the heritage site inspection and the SAPS site inspection in the event of a human remains incident report.
6. The ECO / ELO officer should facilitate heritage reporting and heritage compliance requirements by SAHRA / the relevant PHRA, between the developer / construction consultant, the heritage specialist, the SHE / SHEQ officer (where relevant) and the SAPS (where relevant).

- **Duties of the Developer / Construction Consultant:**

The developer / construction consultant should ensure that an adequate heritage contingency budget is accommodated within the project budget to facilitate and streamline the heritage compliance process in the event of identification of incidental palaeontological, archaeological and cultural heritage resources during the course of development, including as a norm during vegetation clearing, surface scraping, trenching and excavation phases, when resources not visible at the time of the surface assessment may well be exposed.