

**Bulk Water Pipeline to the Boxwood Development,
East London, Buffalo City Metropolitan Municipality, Eastern Cape**

- 17 March 2020 -

Report to:

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Specialist Declaration of Interest

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

- I act as independent specialist in this application;
- I do not have any financial or personal interest in the application, its' proponent or subsidiaries, aside from fair remuneration for specialist services rendered;
- I am suitably qualified, accredited and experienced to act as independent specialist in this application;
- That work conducted have been done in an objective manner – and that any circumstances that may have compromised objectivity have been reported on transparently;
- That all material information collected for purposes of this application, that may reasonably influence the decision of the competent authority, are transparently disclosed in the report; and
- That work conducted have been done in accordance with relevant heritage legislation, regulations and policy guidelines, and with cognisance to environmental legislation, regulations and policies, including the principle of Integrated Environmental Management (IEM).



Signature –

- 17 March 2020 -

Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape

Executive Summary

Project Description –

Sherman Environmental Consulting have been appointed as independent EAP, on behalf of the Eastern Cape Department of Human Settlement (DHS), to apply for the EA, including a BAR and EMPr to the Eastern Cape DEDEAT for the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape*. The proposed development is situated at general development coordinate S33°00'50.3"; E27°39'56.9" [1:50,000 Map Ref – 3327BA] on the properties Farm 862 and Farm 863 and will comprise an approximate 2.34km pipeline and a 6ML concrete reservoir, to be constructed near the Boxwood development site. The proposed water pipeline development forms part of the resettlement programme for the Orange Grove community, currently occupying land near the East London Airport.

The Phase 1 Archaeological & Cultural Heritage Impact Assessment –

Project Name & Locality: *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* [1:50,000 Map Ref – 3327BA].

Summary of Findings:

Two (2) Provincial Heritage Sites (PHS), namely Lower (SAHRA Identifier 9/2/026/0011) and Upper Needs Camp (SAHRA Identifier 9/2/050/0041) are situated within 5km from the study site but will not be impacted on based on proximity from the study site. No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the field assessment. One (1) contemporary site, namely Site BWD-01, not formally protected by the NHRA 1999, is situated adjacent to the line route.

- The proposed development poses no 'fatal flaws' with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a 'No-Go' option is irrelevant.
- No archaeological and cultural heritage mitigation recommendations need be implemented during the construction phase.
- The development will have no cumulative impact on archaeological or cultural heritage resources.
- [In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999, being identified during the course of development the process described in 'Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase' should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

Heritage Compliance Summary – Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
Bulk Water Pipeline to the Boxwood Development				
9/2/026/0011	Lower Needs Camp	S33°00'58"; E27°39'00" (SAHRA Record)	Provincial Heritage Site (PHS)	Site Conservation (Based on proximity - Without the developer having to ensure additional measures)
9/2/050/0041	Upper Needs Camp	S33°00'45"; E27°37'05" (SAHRA record)	Provincial Heritage Site (PHS)	Site Conservation (Based on proximity – Without the developer having to ensure additional measures)
BWD-01	Contemporary Period – Structure Remains	S33°00'50.3"; E27°39'56.9"	Site not formally protected by the NHRA 1999	No EC-PHRA permit required in the event of alteration or destruction of the site

Recommendations –

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* project proceeds as applied for without the developer having to comply with additional heritage compliance requirements prior to, or during development.

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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Resumé: Karen van Ryneveld

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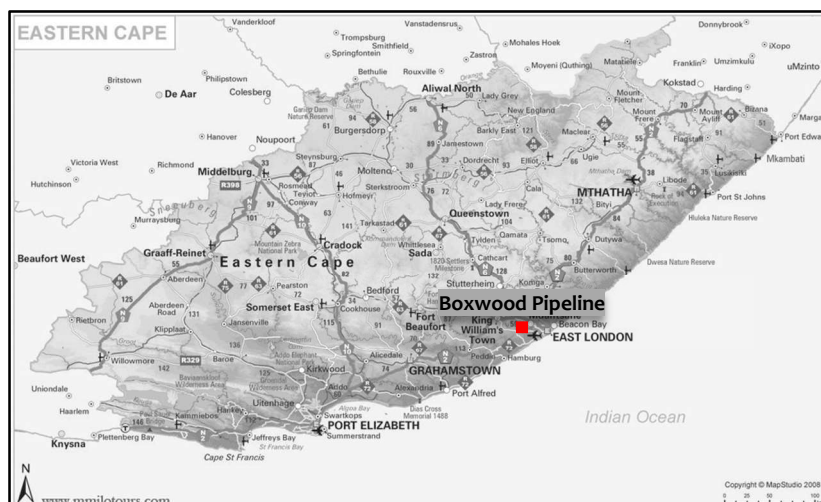
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1 – Project Description & Terms of Reference

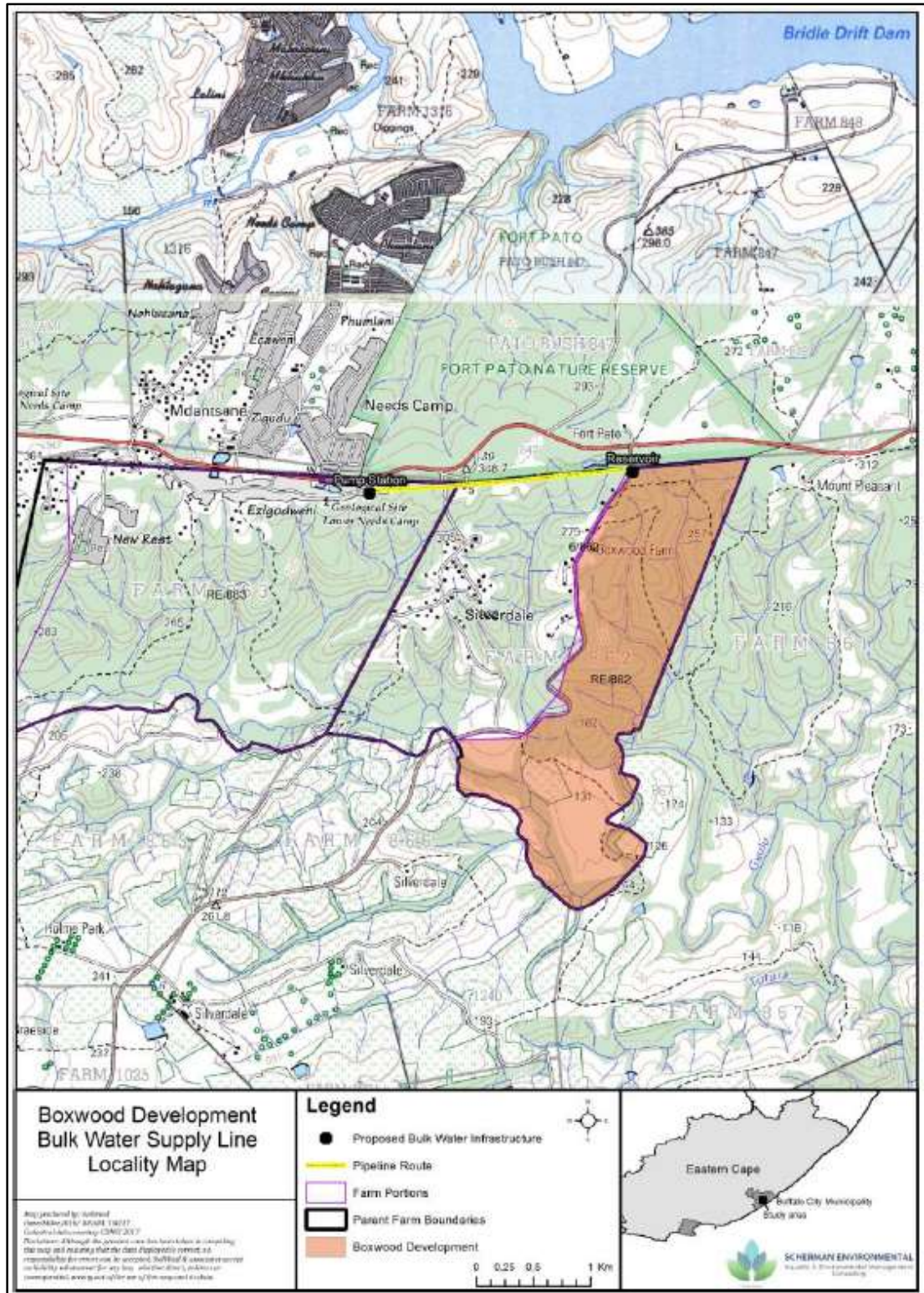
Sherman Environmental Consulting have been appointed as independent Environmental Assessment Practitioner (EAP), on behalf of the Eastern Cape Department of Human Settlement (DHS), to apply for the Environmental Authorization (EA), including a Basic Assessment Report (BAR) and Environmental Management Plan (EMPr) to the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT) for the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape*. The proposed development is situated at general development coordinate $S33^{\circ}00'50.3''$; $E27^{\circ}39'56.9''$ [1:50,000 Map Ref – 3327BA] on the properties Farm 862 and Farm 863 and will comprise an approximate 2.34km pipeline and a 6ML concrete reservoir, to be constructed near the Boxwood development site. The proposed water pipeline development forms part of the resettlement programme for the Orange Grove community, currently occupying land near the East London Airport (Sherman Environmental 2020).

ArchaeoMaps have been appointed by Sandy van der Waal to compile the Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the development, as specialist component to the application's Heritage Impact Assessment (HIA), and with findings and recommendations thereof to be included in the BAR and EMPr. Terms of Reference (ToR) for the Phase 1 AIA are summarized as:

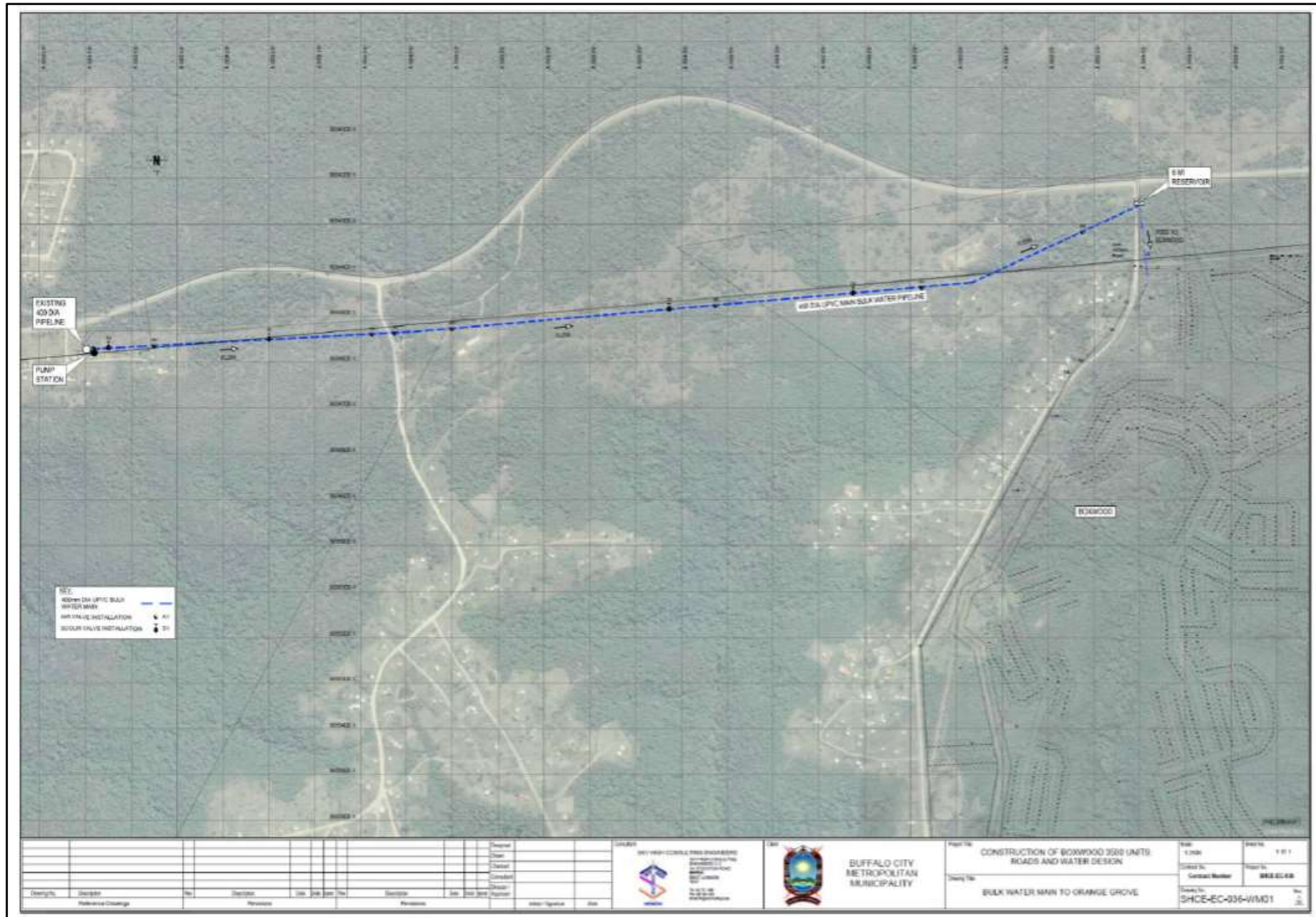
- Describe the existing area to be directly affected by the proposal in terms of its archaeological and cultural heritage characteristics as formally protected by the National Heritage Resources Act, No 25 of 1999 (NHRA 1999) and the general sensitivity of these components to change;
- Describe the likely scope, scale and significance of impacts (positive and negative) on the archaeological and cultural heritage resources of the area associated with the 1) construction and 2) operation or use phases of the proposal;
- Make recommendations on the scope of any mitigation measures that may be applied during the 1) construction and 2) operation or use phases to reduce / avoid the significance of identified related impacts. Mitigation measures could be design recommendations as well as operational controls, monitoring programmes, Phase 2 mitigation, management procedures and the like;
- Broadly describe the implication of a 'No-Go' option;
- Broadly comment on the cumulative impact (positive or negative) on archaeological or cultural heritage resources associated with the 1) construction and 2) operation or use phases of the proposal; and
- Confirm if there are any outright 'fatal flaws' to the proposal at its current location from an archaeological and cultural heritage perspective.



Map 1: General locality of the proposed Bulk Water Pipeline to the Boxwood Development, East London, BCMM, EC (Base Map – MapStudio, 2008)



Map 2: General locality of the Ngqamakhwe Regional Water Supply Scheme – Phase 3, Ngqamakhwe, ADM, Eastern Cape [1:50,000 Map Ref: 3327BA] (Sherman Environmental 2020)



Map 3: Detailed route of the proposed Bulk Water Pipeline (Sherman Environmental 2020)

2 – The Phase 1 Archaeological & Cultural Heritage Impact Assessment

2.1) Archaeological & Cultural Heritage Legislative Compliance

The Phase 1 Archaeological & Cultural Heritage Impact Assessment (AIA) for the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, 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). This report is submitted in (partial) fulfilment of the NHRA 1999, Section 38(3) requirements, for purposes of a NHRA 1999, Section 38(4) / Section 38(8) Heritage Impact Assessment (HIA) Comment by the EC PHRA.

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 300m in length;
b)	The construction of a bridge or similar structure exceeding 50m in length;
c)	Any development or other activity which will change the character of a site –
i.	Exceeding 5,000m ² 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 10,000m ² in extent;
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: Extract from the NHRA 1999, Section 38

The Phase 1 AIA aimed to locate, identify and assess the significance of archaeological and cultural heritage resources, inclusive of archaeological deposits / sites (Stone Age, Iron Age and Colonial Period), rock art and shipwreck sites, built structures older than 60 years, sites of military history older than 75 years, certain categories of burial grounds and graves, graves of victims of conflict, basic living heritage and cultural landscapes and viewsapes as defined and protected by the NHRA 1999, Section 2, 34, 35 and 36, that may be affected by the development.

This report comprises a Phase 1 AIA, including a basic pre-feasibility study and field assessment only. The report was prepared in accordance with the 'Minimum Standards' specifications for Phase 1 AIA reports, as stipulated by SAHRA (2007).

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 (2017).

2.2) Methodology & Gap Analysis

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

- The pre-feasibility assessment is based on the Appendix A schematic outline of South Africa's Pre-colonial and Colonial past, associated with introductory archaeological as well as general and scientific literature available and relevant to the study site. Databases consulted include the SAHRA 2009 Mapping Project Database (MPD), the South African Heritage Resources Information System (SAHRIS) and SAHRA database(s) on declared Provincial Heritage Sites (PHS) pertaining to the study site. The study excludes consultation of museum and university databases.

- The field assessment was done over a 1 day period with fieldwork conducted by the author. The assessment was done by foot and limited to a Phase 1 surface survey. GPS co-ordinates were taken with Garmin Montana 680 (Datum: WGS84) Photographic documentation was done with a Canon EOS 1300D camera. A combination of Garmap (Base Camp) and Google Earth software was used in the display of spatial information.

The Phase 1 AIA was done according to the system and 'Minimum Standards' prescribed for the 3-tiered Phase 1-3 Heritage Impact Assessment (HIA) process (SAHRA 2007):

- Phase 1 HIA – A Phase 1 HIA is compulsory for development types as stipulated in the NHRA 1999, Section 38(1) and Section 38(8), including any other development type or study site as required by the South African Heritage Resources Agency (SAHRA) or relevant Provincial Heritage Resources Authority (PHRA). A Phase 1 HIA comprises at minimum of an archaeological (AIA) and palaeontological (PIA) study, but aims to address all heritage types protected by the NHRA 1999 and to alert developers to additional heritage specialist study requirements, if and where relevant to a development. Phase 1 HIA studies focusses on pre-feasibility and desktop studies, routinely coined with field assessments in order to locate, describe and assign heritage site significance ratings to identified resources that may be impacted by development. The aim of a Phase 1 AIA is to make site specific and general development recommendations regarding identified heritage resources for development planning and implementation purposes and may include recommendations for conservation, heritage site declaration, monitoring, Phase 2 mitigation (excavation), or destruction.
- Phase 2 HIA – Phase 2 HIAs are as a norm required where heritage resources of such significance have been identified during the Phase 1 HIA that mitigation (excavation) thereof is necessary for development purposes. Aside from large scale Phase 2 mitigation (routinely to precede development impact), lower keyed Phase 2 requirements may well include sampling, testing and monitoring during the construction or implementation phase of a development. Phase 2 HIA work is as a norm done under a compulsory heritage permit.
- Phase 3 HIA – As an extension to Phase 2 HIA work or cases where recommendations for heritage declaration formed part of a development's heritage compliance requirements, heritage resources of such scientific or heritage tourism significance, that their long-term conservation and continued research would be necessary within a development framework is proposed as a Phase 3 HIA.

Archaeological and cultural heritage site significance assessment and associated mitigation recommendations are done according to the combined NHRA 1999, Section 7(1) and SAHRA (2007) system.

SAHRA Archaeological & Cultural Heritage Site Significance System			
Site Significance	Field Rating	Grade	Recommended Mitigation
High Significance	National Significance	Grade I	Heritage site conservation / Heritage site development
High Significance	Provincial Significance	Grade II	Heritage site conservation / Heritage site development
High Significance	Local Significance	Grade III-A	Heritage site conservation or extensive mitigation prior to development / destruction
High Significance	Local Significance	Grade III-B	Heritage site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	Grade IV-A	Heritage site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	Grade IV-B	Heritage 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 heritage mitigation required prior to or during development / destruction

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

2.1.1) Pre-feasibility Summary

Based on the Appendix A schematic outline of the Pre-colonial and Colonial Periods in South Africa and background literature and database information, the probability of archaeological and cultural heritage resources affected by, or situated in proximity to the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* study site can briefly be described as:

Archaeological and Basic Cultural Heritage Probability Assessment – Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape			
Primary Type / Period	Sub-period	Sub-period type site	Probability
EARLY HOMININ / HOMINID	-	-	None
	Graves / human remains: High scientific significance		
STONE AGE	Earlier Stone Age (ESA)		Low-Medium
	Middle Stone Age (MSA)		Low-Medium
	Later Stone Age (LSA)		None
		Rock Art	None
		Shel Middens	None
	Graves / human remains: ESA & MSA - High scientific significance; LSA – High scientific & social significance		
IRON AGE	Early Iron Age (EIA)		None
	Middle Iron Age (MIA)		None
	Later Iron Age (LIA)		High
	Graves / human remains: EIA – High scientific significance; MIA & LIA – High scientific & social significance		
COLONIAL PERIOD	Colonial Period		Medium-High
		LSA – Colonial Period Contact	None
		LIA – Colonial Period Contact	Low-Medium
		Industrial Revolution	Low-Medium
		Apartheid & Struggle	None
	Graves / human remains: Medium-high scientific & high social significance		

Table 3: Archaeological and basic cultural heritage probability assessment

2.1.2) The SAHRA 2009 MPD & SAHRIS

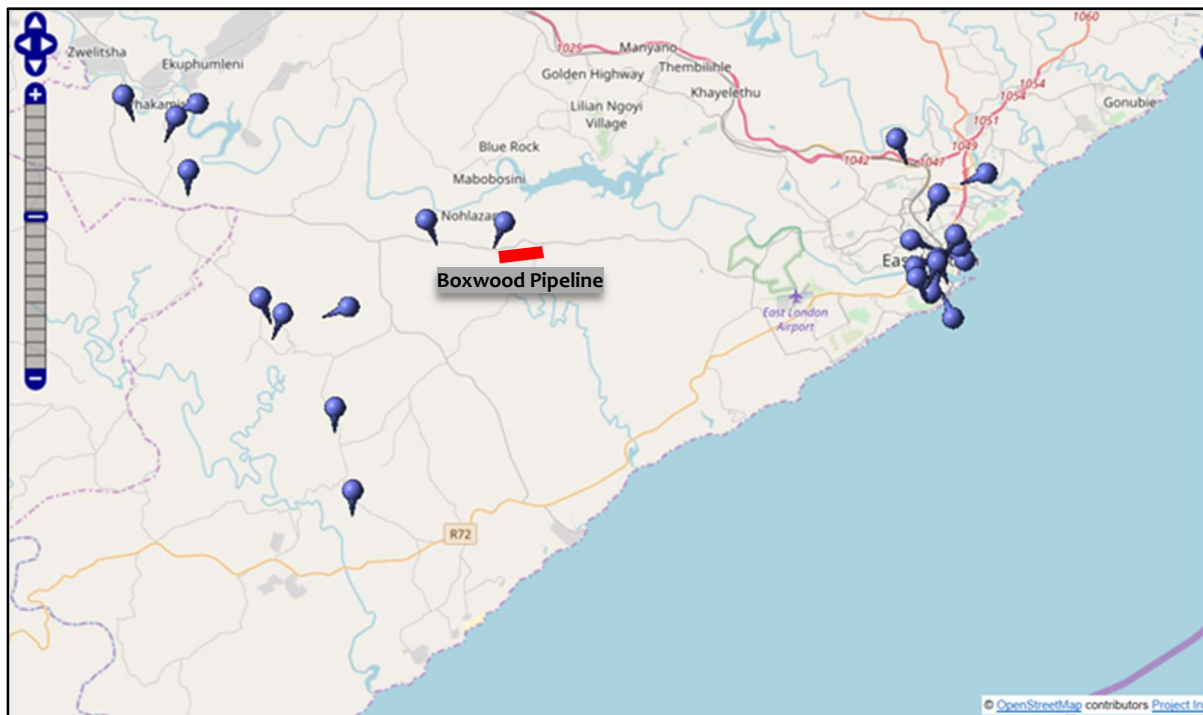
Nine (9) SAHRIS cases are recorded with study sites situated within an approximate 5km radius from the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* study site. Of the 9 recorded SAHRIS cases 3 are recorded as ‘For Noting’ only, including SAHRIS CaseIDs 2594, 2434 and 2484, all being gravel mine applications, while SAHRIS CaseID 1912, an amendment application for the Ncera Macadamia Nut Farm required no specialist heritage studies. Five (5) recorded SAHRIS cases are associated with specialist heritage studies with relevant archaeological and cultural heritage reports listed as:

- Van Ryneveld, K. (ArchaeoMaps). 2007. *Phase 1 Archaeological Impact Assessment – Mnt. Coke Eco-Residential and Golf Estate, East London, Eastern cape, South Africa* [SAHRIS MapID 01224].
- Van Ryneveld, K. (ArchaeoMaps). 2013. *Phase 1 Archaeological Impact Assessment – The Proposed Sunny South Housing Development, Buffalo City Metropolitan Municipality, Eastern Cape, South Africa* [SAHRIS CaseID 2251].
- Van Ryneveld, K. (ArchaeoMaps). 2014a. *Phase 1 Archaeological Impact Assessment – Proposed Construction of the Needs Camp / Potsdam Bridge and Access Road (near East London), BCMM, Eastern Cape, South Africa* [SAHRIS CaseID 6912].
- Van Ryneveld, K. (ArchaeoMaps). 2014b. *Phase 1 Archaeological Impact Assessment – Proposed Utilization of the Needs Camp / Potsdam Borrow Pit [NCP_BP01], (near East London), BCMM, Eastern Cape, South Africa* [SAHRIS CaseID 6913].
- Van Ryneveld, K. (ArchaeoMaps). 2015. *Phase 1 Archaeological Impact Assessment – Orange Grove Residential Development, Farm RE/862, East London, BCMM, Eastern Cape* [SAHRIS CaseID 8577].

2.1.3) SAHRA Provincial Heritage Site Database – Eastern Cape

Two (2) geo-referenced declared Provincial Heritage Sites (PHS*) are recorded in the SAHRA – Eastern Cape database (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape) and situated within a 5km radius from the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* study site. The proposed development will however not impact on any of these sites. In addition, a number of PHS are recorded in the 5-10km range from the study site, listed as:

- i. *SAHRA Identifier 9/2/026/0011 - Lower Needs Camp, East London
- ii. *SAHRA Identifier 9/2/050/0041 - Upper Needs Camp, King Williams Town District, Cuylerville
(The proposed development will not impact on these sites. No additional conservation measures are necessary based on proximity of the study site to the PHS).
- iii. SAHRA Identifier 9/2/050/0019 - Sutton House, Queens Road, King Williams Town
- iv. SAHRA Identifier 9/2/050/0012 - Magistrates Court, Alexandra Road, King Williams Town
- v. SAHRA Identifier 9/2/050/0013 - Deed's Office, Alexandria Road, King Williams Town
- vi. SAHRA Identifier 9/2/050/0017 - Old Railway Station, Alexandria Road, King Williams Town
- vii. SAHRA Identifier 9/2/026/0006 - Old Methodist Church, Noera, East London District
- viii. SAHRA Identifier 9/2/050/0008 - Holy Trinity Church, Prince Alfred Square, King Williams Town
- ix. SAHRA Identifier 9/2/050/0007 - Old Residency Reserve Road, King Williams Town
- x. SAHRA Identifier (no number) - Fort Murray, Zwelitsha District



Map 4: Spatial distribution of geo-referenced PHS in the SAHRA – Eastern Cape database in relation to the *Bulk Water Pipeline to the Boxwood Development, East London, BCMM, Eastern Cape* (https://en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape)

2.1.4) General Discussion

The Stone Age record of the general area is represented by recorded low density Earlier (ESA) and Middle Stone Age (MSA) deposits from the Needs Camp / Potsdam bridge and access road study site (Van Ryneveld 2014a), with no Later Stone Age (LSA) deposits as yet identified. No Early (EIA) or Middle Iron Age (MIA) deposits have been identified, with the MIA not expected so far south. The Later Iron Age (LIA) is represented by a number of grave and cemetery sites, with 17 such sites recorded during the Sunny South assessment (Van Ryneveld 2013) and a contemporary Place of Worship, of LIA cultural tradition, reported on from the Needs Camp / Potsdam area (Van Ryneveld 2014a). The Colonial Period is well represented, with 1 Colonial Period structure reported on from the Mnt. Coke study site as well as 8 contemporary structures, of Colonial Period cultural tradition, and including residential and farming infrastructure as

well as the memorial cross of Ralph Kenneth Peinke and the memorial plaque of Florence Doreen Pelsler (van Ryneveld 2007). In addition 7 contemporary structures of Colonial Period cultural tradition, and including a factory and residence have been recorded during the Sunny South assessment (Van Ryneveld 2013).

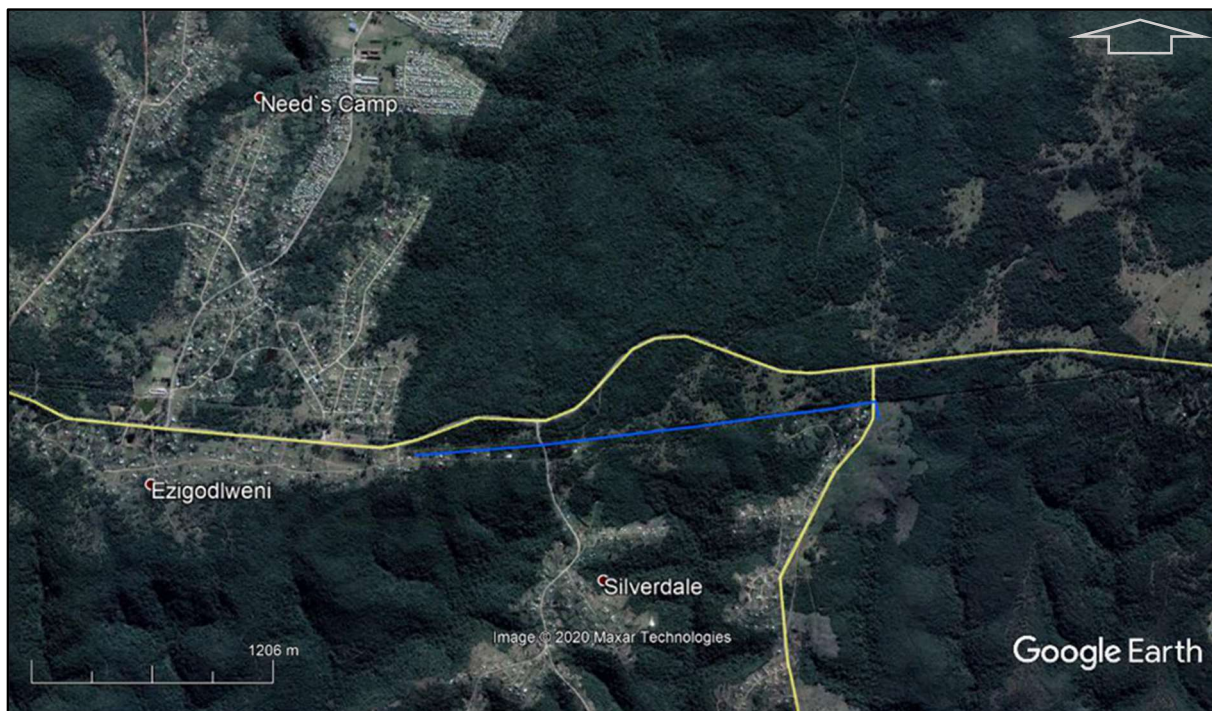
No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the field assessment of the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* study site. Visibility across the study site is however described as low, hampered by thick vegetation covering large parts of the site, but with visible sections at a small earth dam and at the streambed sections. The possibility of uncovering archaeological or cultural heritage resources or sites during vegetation clearing or trenching thus remains high.

One (1) contemporary heritage resource (not formally protected by the NHRA 1999) was identified, namely Site BWD-01.

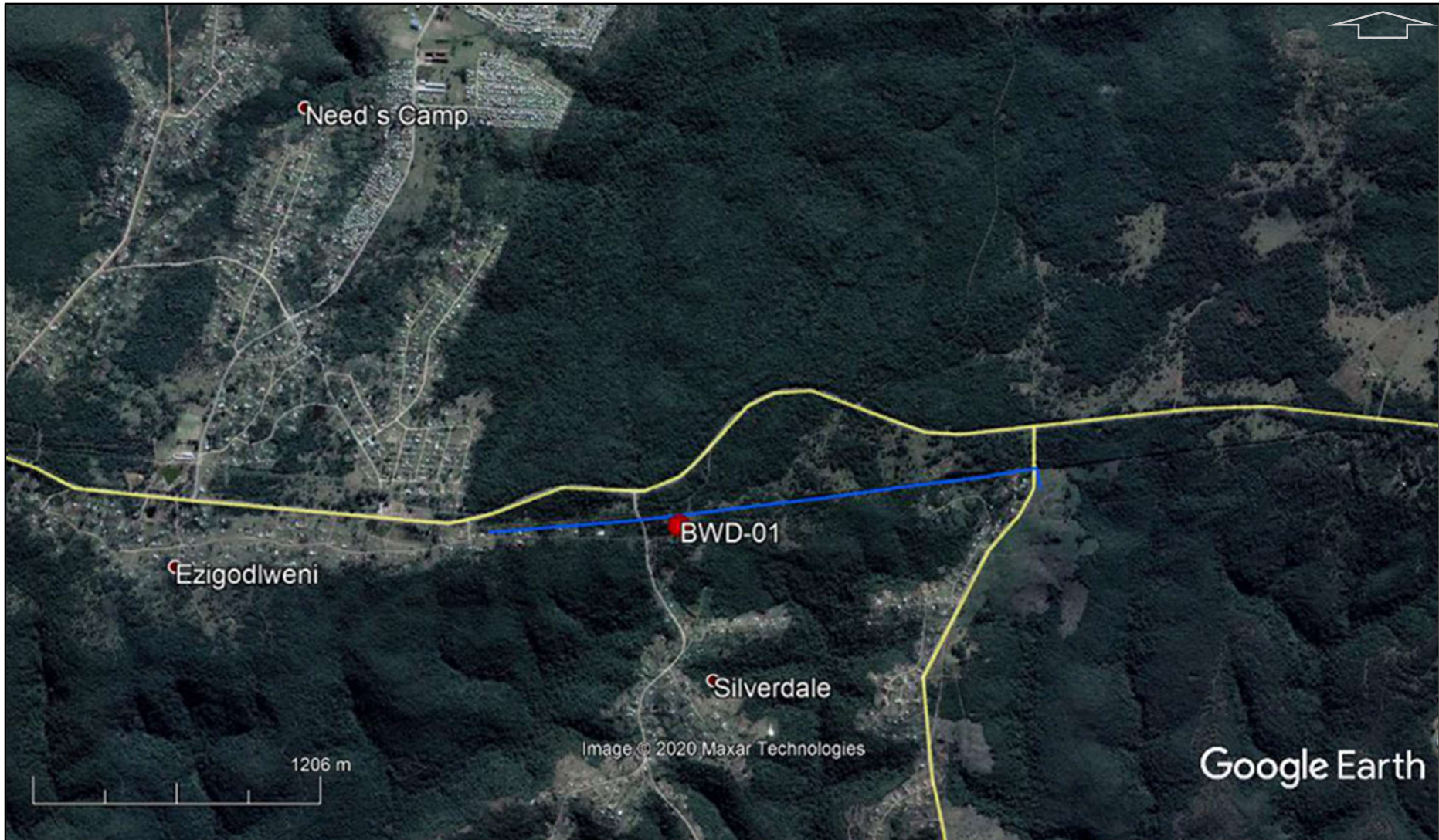
2.2.1) Site BWD-01 – Contemporary Period – Structure Remains: S33°00'52.6"; E27°39'45.8"

Site BWD-01 comprises the remains of a number of contemporary structures, mainly encompassing only cement floors but including tiled floor remains with low rising walls. Structure remains may well represent an original farm facility which have been repurposed for a construction site (incl. additions) with specific reference to its proximity to the existing reservoir and water infrastructure in the vicinity, and demolished after completion of works.

- **Site Significance and Recommendations:** Site BWD-01, with remains post-dating 60 years age, is not formally protected by the NHRA 1999; no SAHRA site significance assignment is applicable. Development may impact on the site. Impact on the site is not subject to an EC PHRA site alteration / destruction permit.



Map 5: General locality of the proposed *Bulk Water Pipeline to the Boxwood Development, East London, BCMM, Eastern Cape* study site



Map 6: Phase 1 AIA results of the proposed Bulk Water Pipeline to the Boxwood Development, East London, BCMM, Eastern Cape study site



Plate 1: General view of the Boxwood study site – Eastern beginning of line route



Plate 3: General view of the Boxwood study site (E-W) [2]



Plate 2: General view of the Boxwood study site (E-W) [1]



Plate 4: View of the earth dam



Plate 5: Anthropogenic sterile sections at the earth dam [1]



Plate 7: General view of the Boxwood study site (E-W) [3]



Plate 6: Anthropogenic sterile sections at the earth dam [2]



Plate 8: General view of the Boxwood study site (E-W) [4]



Plate 9: General view of the Boxwood study site (E-W) [5]



Plate 11: General view of the Boxwood study site at the fenced reservoir



Plate 10: General view of the Boxwood study site (E-W) [6]



Plate 12: View of Site BWD-01 structure remains adjacent to the reservoir



Plate 13: Site BWD-01 cement floor remains [1]



Plate 15: General view of the Boxwood study site (E-W) [7]



Plate 14: Site BWD-01 cement floor remains [2]



Plate 16: General view of the Boxwood study site – Western ending of the line route

3 – Environmental Impact Assessment Rating

Identified archaeological and cultural heritage resources are ascribed an Environmental Impact Assessment (EIA) rating, based on the outline presented below to provide a significance rating of development impact on resources, both during the 1) construction and 2) operation and use phases of development (in accordance with NEMA 1998, Regulations 2014):

Overall Nature:	<ul style="list-style-type: none"> 1) Negative (negative impact on affected biophysical or human environment), or 2) Positive (benefit to the affected biophysical or human environment).
Type:	<ul style="list-style-type: none"> 1) Direct (caused by the action and occur at the same time and place), 2) Indirect or secondary (caused by the action and are later in time or further removed in distance but reasonably foreseeable), or 3) Cumulative (impact which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions; can result from individually minor, but collectively significant actions taking place over a period of time).
Spatial Extent:	<ul style="list-style-type: none"> 1) Site (immediate area of activity, incorporating a 5m zone from the edge of the affected area), 2) Local (area up to and/or within 10km from the 'site' as defined above), 3) Regional (entire community, basin or landscape), or 4) National (South Africa).
Duration:	<ul style="list-style-type: none"> 1) Short-term (impact would last for the duration of activities; quickly reversible), 2) Medium-term (impact would affect project activity; reversible over time), 3) Long-term (impact would continue beyond project activity), or 4) Permanent (impact would continue beyond decommissioning).
Severity:	<ul style="list-style-type: none"> 1) Low, 2) Medium, or 3) High, being +) Positive, or -) Negative (based on separately described categories examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functionality or slightly alters the environment itself).
Reversibility:	<ul style="list-style-type: none"> 1) Completely reversible (completely reversible impact with implementation of correct mitigation measures), 2) Partly reversible (partly reversible impact with implementation of correct mitigation measures), or 3) Irreversible (impact cannot be reversed, regardless of mitigation or rehabilitation measures).
Replaceability:	<ul style="list-style-type: none"> 1) Resource will not be lost (resource will not be lost provided mitigation measures are implemented), 2) Resource will be partly lost (partial loss or destruction of the resource will occur even though management and mitigation measures are implemented), or 3) Resource cannot be replaced (resource is irreplaceable no matter which management or mitigation measures are implemented).
Probability:	<ul style="list-style-type: none"> 1) Unlikely (<40% probability), 2) Possible (40% probability), 3) Probable (>70% probability), or 4) Definite (>90% probability).
Mitigation potential:	<ul style="list-style-type: none"> 1) High or completely mitigatable (relatively easy and cost effective to manage. Specialist expertise and equipment generally not required. Nature of impact easily understood and may be mitigated through implementation of a management plan or 'good housekeeping', including regular monitoring and reporting regimes. Significance of the impact after mitigation is likely to be low or negligible), 2) Moderate or partially mitigatable (management requires higher level of expertise and resources to maintain impacts with acceptable levels. Mitigation can be tied up in the design of the project. Significance of the impacts after mitigation is likely to be low to moderate. It may not be possible to mitigate the impact entirely, with residual impacts resulting), or 3) Low or un-mitigatable (will not be possible to mitigate the impact entirely, regardless of expertise and resources. Potential to manage the impacts may be beyond the scope of the project. Management of the impact is not likely to result in a measurable change in the level of significance).
Impact significance:	<ul style="list-style-type: none"> 1) Negligible, 2) Low (largely of HIGH mitigation potential, after consideration of other criteria), 3) Moderate (largely of MODERATE or partial mitigation potential, after consideration of other criteria), or 4) Substantial (largely of LOW mitigation potential, after consideration of other criteria).

Environmental Impact Assessment Rating: Bulk Water Pipeline to the Boxwood Study Site, East London, Buffalo City Metropolitan Municipality, Eastern Cape												
Potential Impacts	Overall nature	Type	Spatial extent	Duration	Severity	Reversibility	Replaceability	Probability	MITIGATION POTENTIAL	IMPACT SIGNIFICANCE		MITIGATION MEASURES
										Without mitigation	With mitigation	
SITE(S): SAHRA Identifier 9/2/026/0011 (Lower Needs Camp), SAHRA Identifier 9/2/050/0041 (Upper Needs Camp) and BWD-01												
Construction phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operational phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mitigation details: 1) PHS Lower (SAHRA Identifier 9/2/026/0011) and Upper Needs Camp (SAHRA Identifier 9/2/050/0041) are situated in proximity to, but outside the proposed study site and will not be impacted on (Additional conservation measures on behalf of the developer are not recommended) 2) Site BDW-01, contemporary structure remains, is not formally protected by the NHRA 1999												

Table 4: Environmental Impact Assessment Rating: Site BWD-01

With reference to archaeological and cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape* project proceeds as applied for without the developer having to comply with additional heritage compliance requirements prior to, or during development.

Two (2) Provincial Heritage Sites (PHS), namely Lower (SAHRA Identifier 9/2/026/0011) and Upper Needs Camp (SAHRA Identifier 9/2/050/0041) are situated within 5km from the study site but will not be impacted on based on proximity from the study site. No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the field assessment. One (1) contemporary site, namely Site BWD-01, not formally protected by the NHRA 1999, is situated adjacent to the line route.

- The proposed development poses no ‘fatal flaws’ with reference to archaeological and cultural heritage resources.
- From an archaeological and cultural heritage point of view consideration of a ‘No-Go’ option is irrelevant.
- No archaeological and cultural heritage mitigation recommendations need be implemented during the construction phase.
- The development will have no cumulative impact on archaeological or cultural heritage resources.
- [In the event of any incidental archaeological and cultural heritage resources, as defined and protected by the NHRA 1999¹, being identified during the course of development the process described in ‘Appendix B: Heritage Protocol for Incidental Finds during the Construction Phase’ should be followed. The developer is advised to ensure a sufficient heritage contingency budget to address incidental finds during the course of development.]

Heritage Compliance Summary – Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, Eastern Cape				
Map Code	Site	Co-ordinates	Site Significance	Recommendations
Bulk Water Pipeline to the Boxwood Development				
9/2/026/0011	Lower Needs Camp	S33°00'58"; E27°39'00" (SAHRA Record)	Provincial Heritage Site (PHS)	Site Conservation (Based on proximity - Without the developer having to ensure additional measures)
9/2/050/0041	Upper Needs Camp	S33°00'45"; E27°37'05" (SAHRA record)	Provincial Heritage Site (PHS)	Site Conservation (Based on proximity – Without the developer having to ensure additional measures)
BWD-01	Contemporary Period – Structure Remains	S33°00'50.3"; E27°39'56.9"	Site not formally protected by the NHRA 1999	No EC-PHRA permit required in the event of alteration or destruction of the site

Table 5: Heritage compliance summary

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.

¹ Simplified Guide to the Identification of Archaeological Sites:

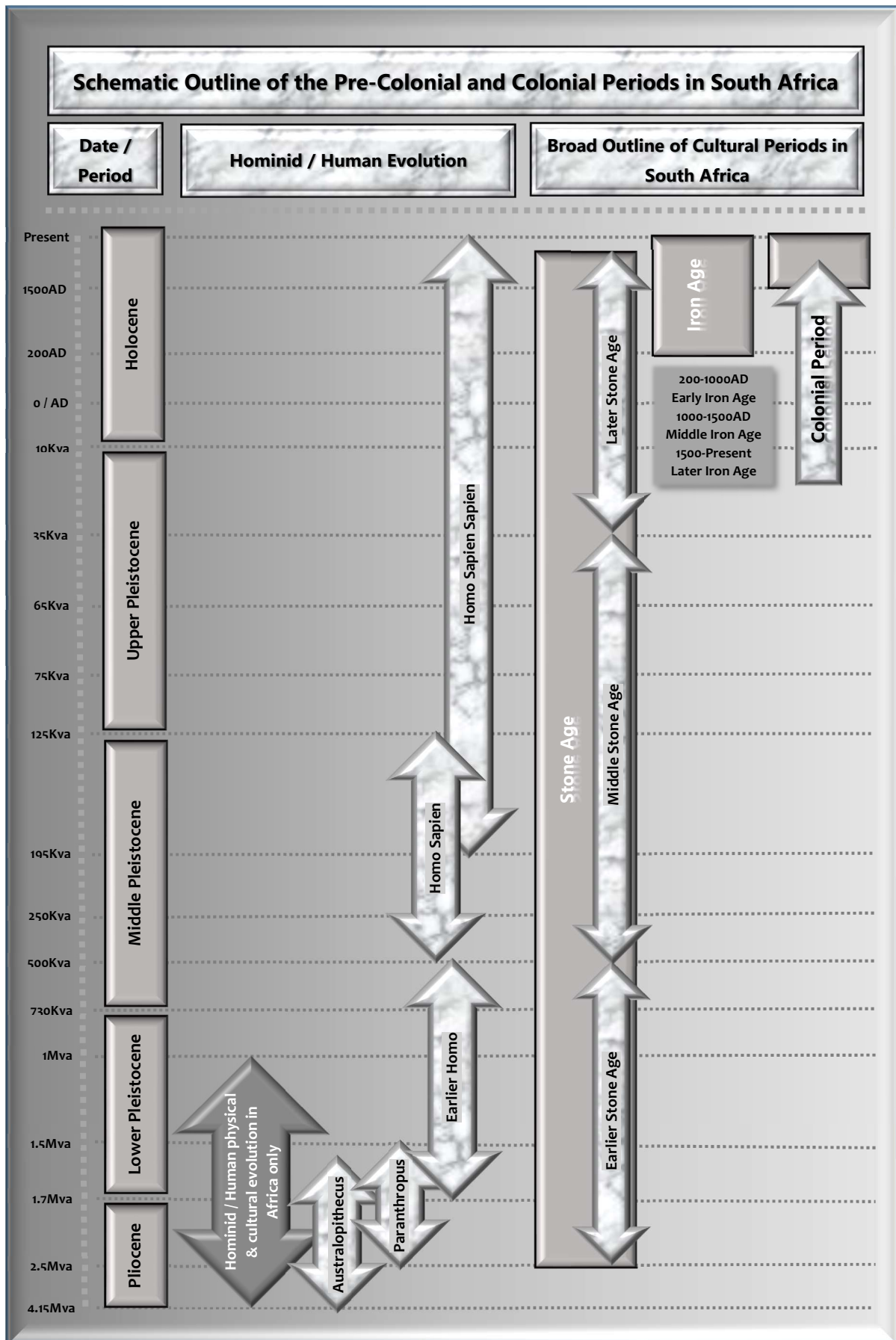
- ❖ **Stone Age** – Knapped stone display flakes and flake scars that appear unnatural and may result in similar type ‘shaped’ stones often concentrated in clusters or forming a distinct layer in the geological stratigraphy. ESA shapes may represent ‘pear’ or oval shaped stones, often in the region of 10cm or larger. Typical MSA types include blade-like or rough triangular shaped artefacts, often associated with randomly shaped lithics or flakes that display use- or edge-wear around the rim of the artefact. LSA types are similar to MSA types, but generally smaller (<3cm in size), often informally shaped, and are frequently found in association with bone, pieces of charcoal, ceramic shards and food remains.
 - **Rock Art** – Includes both painted and engraved 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 identified by either mound or depression hollows. Typical artefacts include ceramic remains, farming equipment, beads and trade goods, metal artefacts (including jewellery) 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 bottle, 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.
- ❖ **Grave and Cemetery Sites** – Marked grave and cemetery sites are routinely associated with the Iron Age and Colonial Period. Unmarked grave sites associated with the Stone Age, Iron Age and Colonial Period may be uncovered during the course of development.

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.

List of Acronyms and Abbreviations	
AD	Anno Domini (the year o)
AIA	Archaeological (and Cultural Heritage) Impact Assessment
AMAFA	Amafa aKwaZulu-Natali (Natal PHRA)
ASAPA	Association of Southern African Professional Archaeologists
BAR	Basic Assessment Report
BC	Before the Birth of Christ (the year o)
BCE	Before the Common Era (the year o)
BID	Background Information Document
BP	Before the Present (the year o)
Cm	Centimetre
CMP	Conservation Management Plan
CRM	Cultural Resources Management
DAC	Department of Arts and Culture
DEAT	Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
ELO	Environmental Liaison Officer
EC PHRA	Eastern Cape Provincial Heritage Resources Agency
EIA ₁	Environmental Impact Assessment
EIA ₂	Early Iron Age
EMPr	Environmental Management Plan / Programme Report
ESA	Earlier Stone Age
Ha	Hectare
HIA	Heritage Impact Assessment
HWC	Heritage Western Cape
ICOMOS	International Council on Monuments and Sites
IEM	Integrated Environmental Management
Km	Kilometre
Kya	Thousands of years ago
LIA	Later Iron Age
LSA	Later Stone Age
M	Metre
m ²	Square metre
MIA	Middle Iron Age
Mm	Millimetre
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 Agency
PSSA	Palaeontological Society of Southern Africa
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SIA	Social Impact Assessment

Table 5: List of Acronyms and Abbreviations

1. en.wikipedia.org/wiki/List_of_heritage_sites_in_Eastern_Cape [Accessed: March 2020].
2. Sherman Environmental. 2020. *Background Information Document [BID]. Proposed Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Municipality.*
3. South African Government. (No. 107 of) 1998. *National Environmental Management Act.*
4. South African Government. (No. 25 of) 1999. *National Heritage Resources Act.*
5. South African Heritage Resources Agency. 2007. *Minimum Standards for the Archaeological and Heritage Components of Impact Assessments.* (Unpublished guidelines.)
6. Van Ryneveld, K. (ArchaeoMaps). 2007. *Phase 1 Archaeological Impact Assessment – Mnt. Coke Eco-Residential and Golf Estate, East London, Eastern cape, South Africa.*
7. Van Ryneveld, K. (ArchaeoMaps). 2013. *Phase 1 Archaeological Impact Assessment – The Proposed Sunny South Housing Development, Buffalo City Metropolitan Municipality, Eastern Cape, South Africa.*
8. Van Ryneveld, K. (ArchaeoMaps). 2014a. *Phase 1 Archaeological Impact Assessment – Proposed Construction of the Needs Camp / Potsdam Bridge and Access Road (near East London), BCMM, Eastern Cape, South Africa.*





Heritage Impact Assessment (HIA) – Bulk Water Pipeline to the Boxwood Development, East London, Buffalo City Metropolitan Municipality, 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-interment / 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.

Resumé
Karen van Ryneveld
2020

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- 2) E-mail – karen@archaeomaps.co.za
- 3) Website – www.archaeomaps.co.za
- 4) Postal address – Postnet Suite 239, Private Bag X3, Beacon Bay, 5205

Company: ArchaeoMaps cc

Occupation: Archaeologist

Qualification: MSc Archaeology (WITS University – 2003)

Accreditation:

- 1) Association of Southern African Professional Archaeologists (ASAPA) accredited Cultural Resources Management CRM practitioner [member nr – 163]
 - o 2010 – ASAPA CRM Section: Principle Investigator – Stone Age
 - o 2005 – ASAPA CRM Section: Field Director – Iron Age & Colonial Period
- 2) SAHRA, AMAFA, EC PHRA and HWC listed ASAPA accredited CRM archaeologist

Tertiary Education

2010 **University of South Africa (UNISA), Pretoria** (Project Management 501)

2006 – 2007 **Nelson Mandela Metropolitan University (NMMU), Port Elizabeth** (Undergraduate Certificate in Geographical Information Systems – GIS)

2001 – 2003 **University of the Witwatersrand (WITS), Johannesburg** (MSc Archaeology)

1999 – 2000 **University of Pretoria (UP), Pretoria** (BA Hons. Archaeology)

1991 – 1993 **University of Pretoria (UP), Pretoria** (BA Archaeology & History of Art)

Courses

2016/01 SPA (Safety Passport Alliance) – Petrol Retail [SA Safety Management Training Services – SMST]

Employment – Professional Archaeology

2007/04 – Present ArchaeoMaps [Self-employed] (Archaeologist – CRM)

2006/06 – 2007/03 National Museum, Bloemfontein (Archaeologist – CRM, Dept. of Archaeology)

2005/04 – 2006/05 McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

2004/04 – 2005/01 Amafa aKwaZulu-Natali (HoD: Archaeology, Palaeontology & Meteorites Unit – APM Unit)

2002/09 – 2004/03 McGregor Museum, Kimberley (Archaeologist – CRM / Research, Dept. of Archaeology)

Employment – Freelance: Ground Penetrating Radar

2015/10 – Present Terra Scan assistant (BCM area, EC) – GPR & underground utilities focussing on petrol retail (oil & gas) industry

Archaeology – Summary

Karen has been involved in CRM archaeology since 2003 and has been the author (including selected co-authored reports) of approximately 500 Phase 1 AIA studies. Phase 1 AIA work is centred in South Africa, focussing 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 aKwaZulu-Natali (2004).

Company Profile

Company Name : ArchaeoMaps cc

Registration Number : 2005/180719/23

VAT Number : Not VAT Registered

Accountant : AZIMA Financial Services

Members / Shareholders : Karen van Ryneveld (100%)

BBBEE Status : Exempted Micro Enterprise (EME)