PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

CORNELIS RIVER DAM – EZENEZELENI: PHUMELELA REGIONAL BULK WATER SUPPLY SCHEME, WARDEN, FREE STATE, SOUTH AFRICA.

DATE: *2012-05-17*

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CORNELIS RIVER DAM – EZENZELENI: PHUMELELA REGIONAL BULK WATER SUPPLY SCHEME, WARDEN, FREE STATE, SOUTH AFRICA

EXECUTIVE SUMMARY

TERMS OF REFERENCE:

Terra Works has been appointed by the consulting engineers, RudNat Projects, on behalf of the project proponent, the Phumelela Local Municipality, to upgrade the existing EIA and EMP to include the SAHRA required HIA for the proposed *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme*, to be situated near Warden in the Phumelela Local Municipal District of the Free State. The project focuses on the construction of the Ezenzeleni Pump Station and WTW and an approximate 6km water line to ensure a sufficient and sustainable water supply to Ezenzeleni (and Warden) from the Cornelis River Dam. ArchaeoMaps was appointed by Terra Works to prepare the Phase 1 AIA as specialist component to the HIA.

THE PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT:

PROJECT AREA: Cornelis River Dam to Ezenzeleni / Warden, Free State [1:50,000 Map Ref: 2728DD & 2729CC].

GAP ANALYSIS: Phase 1 AIA assessment covered the Ezenzeleni pump station, WTW and 6km line route.

METHODOLOGY: One day field assessment; GPS co-ordinates – Garmin Oregon 550; Photographic documentation – Pentax K20D. Archaeological and cultural heritage site significance assessment and mitigation recommendations – SAHRA 2007 system.

SUMMARY:

Code	Site	Period	Co-ordinates	Recommendations
Cornelis River Dam to Ezenzeleni water line route (gravity and rising mains)				
CRD-E. 1	**Site CRD-E.1**	Iron Age – Workers Village	S27°50'11.0"; E29°01'19.1"	*Phase 2 archaeological mitigation & monitoring; Formal conservation ; Temporary conservation & Permanent sign posting* ***OR*** *Realignment of the rising main (and relocation of the Ezenzeleni pump station) [Realignment Option 1]; Formal conservation & Permanent sign posting*
CRD-E.2	**Site CRD-E.2**	Colonial Period – Farmstead	S27°50'09.9"; E29°01'11.3"	*Phase 2 archaeological monitoring; Formal conservation: Feature 2.7; Temporary conservation: Features 2.5 & 2.7; Site Destruction (SAHRA Permit): Feature 2.6 & Permanent sign posting* ***OR*** *Realignment of the rising main [Realignment Option 2]; Formal conservation: Feature 2.7 & Permanent sign posting*
CRD-E.3	**Site CRD-E.3**	Later Stone Age – Rock Art	S27°50'12.5"; E29°01'02.6"	*Phase 2 compilation of basic Rock Art conservation / management plan & Permanent sign posting*
	Iron Age 1	Iron Age – Settlement	S27°50'16.5"; E29°01'30.8"	*N/A (Outside project study site)*
	Iron Age 2	Iron Age – Settlement	S27°50'26.0"; E29°01'23.7"	*N/A (Outside project study site)*
Ezenzeleni Pump Station				
See Site CRD-E.1				*See above recommendations*
Ezenzeleni WTW				
-	-	-	-	*N/A*

RECOMMENDATIONS:

With reference to cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project, Warden, Free State, proceeds as applied for provided the developer complies with the abovementioned recommendations.

PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

CORNELIS RIVER DAM – EZENZELENI: PHUMELELA REGIONAL BULK WATER SUPPLY SCHEME, WARDEN, FREE STATE, SOUTH AFRICA.

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1) TERMS OF REFERENCE

Terra Works Environmental Consultants (Terra Works) has been appointed by the consulting engineers, RudNat Projects, on behalf of the project proponent, the Phumelela Local Municipality, to upgrade the existing Environmental Impact Assessment (EIA) and Environmental Management Plan / Program (EMP) to include the South African Heritage Resources Agency (SAHRA) required Heritage Impact Assessment (HIA) for the proposed *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme*, to be situated near Warden in the Phumelela Local Municipal District of the Free State. The project focuses on the construction of the Ezenzeleni Pump Station and Water Treatment Works (WTW) and an approximate 6km water line (gravity and rising mains) to ensure a sufficient and sustainable water supply to Ezenzeleni (and Warden) from the Cornelis River Dam.

ArchaeoMaps Archaeological Consultancy was appointed by Terra Works to prepare the Phase 1 Archaeological Impact Assessment (AIA) as specialist component to the HIA.

❖ *Development Location, Details & Impact*

The *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project is situated at Warden within the Phumelela Local Municipal District of the Thabo Mofutsanyana District Municipality of the Free State [1:50,000 Map Ref: 2728DD & 2729CC].

The Phumelela Local Municipality is currently experiencing severe water shortages and is considering options to ensure the provision of a sufficient and sustainable potable water system for the future, over both the short and longer term. Water usage has been restricted throughout the past years, but water quality deteriorates on a daily basis. The high rural to urban migration and changing water use pattern, mainly as a result of the introduction of water borne sewerage systems under the bucket eradication program place additional stress on existing infrastructure and resources. The project objective is to implement a sustainable regional bulk water supply scheme in the Phumelela Local Municipal area, prioritizing Warden as Phase 1 (RudNat 2012).

Major problems identified with the water supply system in the immediate area can be summarized as (RudNat 2012):

1. Inadequate storage capacity of treated water in Ezenzeleni;
2. The absence of adequate raw water storage capacity of the existing Warden Dam in the Cornelis River;
3. The poor condition and capacity of the existing Warden Water Treatment Works (WTW); and
4. The need to upgrade the supply system to distribute treated water.

With reference to abovementioned concerns 1 and 2, a concrete reservoir is currently under construction in Ezenzeleni and the Cornelis River dam will be upgraded to cover a surface area of approximately 71.6ha with a catchment area of 75,000km² and an annual run-off of 52,500Ml (RudNat 2012). These 2 development aspects do not form part of the scope of the Cornelis River Dam – Ezenzeleni portion of the project but do provide start and end localities with which the project will link.

The *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project includes:

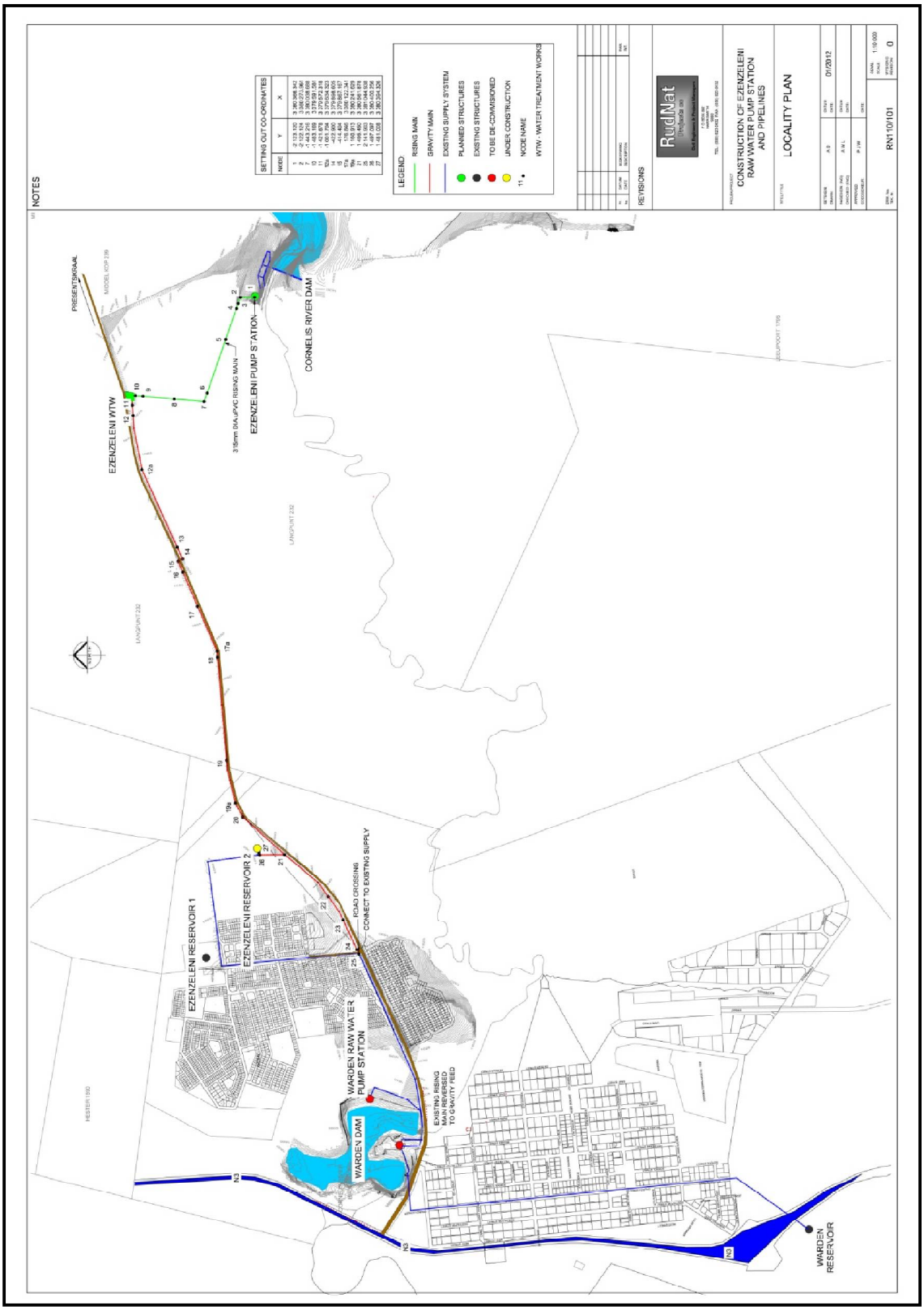
1. Construction of the Ezenzeleni Pump Station (Node 1), situated upstream from the Cornelis River Dam;
2. Construction of the rising main from the Ezenzeleni Pump Station to the Ezenzeleni WTW (Nodes 1 – 10);
3. Construction of the Ezenzeleni WTW (Node 10); and

4. Construction of the gravity main from the Ezenzeleni WTW to the Ezenzeleni reservoir, currently under construction (Nodes 10-21-27) and from the reservoir to its connection with the existing water supply (Nodes 27-21-25).

Figure 1: Warden, Free State

Figure 2: Locality of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site in relation to Warden and Ezenzeleni

Figure 3: Locality plan of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project



2) THE ARCHAEOLOGICAL IMPACT ASSESSMENT

❖ *Archaeological Legislative Compliance*

The Phase 1 Archaeological Impact Assessment (AIA) was done for purposes of compliance to the South African Heritage Resources Agency's (SAHRA) requirements in terms of the National Heritage Resources Act, No 25 of 1999 (NHRA 1999), with specific reference to Section 38.

The Phase 1 AIA was requested as specialist sub-section with findings and recommendations thereto to be included in the Environmental Impact Assessment (EIA) and Environmental Management Plan / Program (EMP), of the project in compliance with requirements of the National Environmental Management Act, No 107 of 1998 (NEMA 1998) and associated Regulations (2006 and 2010).

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 proposed development.

This report comprises of a basic AIA, including a basic pre-feasibility and Phase 1 AIA assessment only. The report does not include any specialist heritage components inclusive of socio-cultural consultation, historical architecture or cultural landscapes.

❖ *Methodology & Assessor Accreditation*

The Phase 1 AIA was conducted over a 1 day period (2012-05-12) by one archaeologist. The assessment was done by foot and vehicle, and limited to a Phase 1 surface survey; no excavation or sub-surface testing was done. GPS co-ordinates were taken with a Garmin Oregon 550 (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 1	Site conservation / Site development
High Significance	Provincial Significance	Grade 2	Site conservation / Site development
High Significance	Local Significance	Grade 3A / 3B	Site conservation or extensive mitigation prior to development / destruction
High / Medium Significance	Generally Protected A	-	Site conservation or mitigation prior to development / destruction
Medium Significance	Generally Protected B	-	Site conservation or mitigation / test excavation / systematic sampling / monitoring prior to or during development / destruction
Low Significance	Generally Protected C	-	On-site sampling, monitoring or no archaeological mitigation required prior to or during development / destruction

Table 1: SAHRA archaeological and cultural heritage site significance assessment

The assessment was done by Karen van Ryneveld (ArchaeoMaps):

- Qualification: MSc Archaeology (2003) WITS University.
- Accreditation:
    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 listed CRM archaeologist.

❖ *Coverage and Gap Analysis*

The Phase 1 AIA covered the total of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site, including the Ezenzeleni pump station, the WTW and the approximate 6km water line route with a general line route development corridor of 15-20m. Vegetation did obscure surface visibility in places, however general visibility across the study site can be described as good.

2.1) PRE-FEASIBILITY ASSESSMENT

Based on the basic introductory literature assessment of South African archaeology (see Appendix – A) the probability of archaeological and cultural heritage sites within the proposed *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site can briefly be described as:

1. **EARLY HOMININ** : Probability – *None*

2. **STONE AGE**
   - a. ESA : Probability – *Medium*
   - b. MSA : Probability – *Medium*
   - c. LSA : Probability – *Medium* (Human remains may be expected; should they be identified they will be of both scientific and social significance)
     - i. Rock Art : Probability – *Low – Medium*
     - ii. Shell Middens : Probability – *None*

3. **IRON AGE**
   - a. Early Iron Age : Probability – *None*
   - b. Middle Iron Age : Probability – *None*
   - c. Later Iron Age : Probability – *Medium* (Human remains expected to be in direct association with archaeological and contemporary sites – of scientific / social significance)

4. **COLONIAL PERIOD**
   - a. Colonial Period : Probability – *Medium* (Human remains expected to be primarily associated with formal cemeteries)
     - i. Iron Age / Colonial Period Contact : Probability – *Low*
     - ii. Industrial Revolution : Probability – *Low*

Archaeological Cultural Resources Management (CRM) projects recorded in the SAHRA mapping project (2009) database and situated within an approximate 70km radius from the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site can be summarized as:

- Becker, E. (Private). 2008. *Environmental Impact Assessment for the Proposed Majuba-Venus 765kv Transmission Power Lines (EIA: 12/12/20/1157), Turn-in at the Majuba Sub-station (EIA: 12/12/20/1161), Extension of the Majuba Sub-station (EIA: 12/12/20/1161), Turn-in at the Venus Sub-station (EIA: 12/12/20/1158)* (SAHRA reference: 2008-SAHRA-0647);
- Birkholtz, P.D. & van der Walt, J. (Archaeology Africa). 2006. *Phase 1 Heritage Impact Assessment for the Construction and Upgrading of the Proposed Access Roads to the Braamhoek Pumped Storage Scheme* (SAHRA reference: 2006-SAHRA-0024);
- Dreyer, C. (Private). 2003. *Archaeological and Historical Assessment of the Nuwejaarspruit Project, Harrismith* (SAHRA reference: 2003-SAHRA-0145);
- Dreyer, C. (Private). 2004. *First Phase Archaeological and Cultural Heritage Investigation of the Proposed Residential Developments on the Townlands of Harrismith* (SAHRA reference: 2004-SAHRA-0171);

- Dreyer, C. (Private). 2005a. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Developments at the Farm Grootkrans 238, Kasteel 106 and Bergplaats 120, Kestel, Free State* (SAHRA reference: 2005-SAHRA-0298);
- Dreyer, C. (Private). 2005b. *First Phase Archaeological and Historical Investigation of the Proposed Erection of a Lattice Mast on the Farm Murasie 542, Bethlehem, Free State* (SAHRA reference: 2005-SAHRA-0155);
- Dreyer, C. (Private). 2005c. *Archaeological Assessment of the Proposed Upgrading of the R57 Road (P9/2) between Reitz and Petrus Steyn, Free State* (SAHRA reference: 2005-SAHRA-0145);
- Dreyer, C. (Private). 2006a. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Development of the Farm Krynauwlust 275, Vrede* (SAHRA reference: 2006-SAHRA-0049);
- Dreyer, C. (Private). 2006b. *First Phase Archaeological and Cultural Heritage Investigation of the Proposed Residential Developments on the Town Lands 131 & 132, Harrismith, Free State* (SAHRA reference: 2006-SAHRA-0090);
- Dreyer, C. (Private). 2006c. *First Phase Archaeological and Cultural Heritage Assessment of the Proposed Residential Developments at the Farm De Brug 1020, Warden, Free State* (SAHRA reference: 2006-SAHRA-0047);
- Dreyer, C. (Private). 2007a. *Archaeological and Cultural Heritage Assessment of the Proposed Residential Developments of Reitz, Free State* (SAHRA reference: 2007-SAHRA-0047);
- Dreyer, C. (Private). 2007b. *First Phase Archaeological and Cultural Heritage Investigation of the Proposed Leisure Residential Developments at Molenriviersdraai 173, Harrismith, Free State* (SAHRA reference: 2007-SAHRA-0497);
- Dreyer, C. (Private). 2008a. *Archaeological and Culture Historical Assessment of the Proposed Residential Developments at Verkykerskop, near Harrismith, Free State* (SAHRA reference: 2008-SAHRA-0117);
- Dreyer, C. (Private). 2008b. *Archaeological and Culture Historical Assessment of the Proposed Water Reservoir Dam at Annasdal 668, Verkykerskop, Free State* (SAHRA reference: 2008-SAHRA-0122);
- Huffman, T.N. (Archaeological Resource Management). 2002. *Archaeological Assessment of the Seekoeivlei Nature Reserve, Memel* (SAHRA reference: 2002-SAHRA-0036);
- Huffman, T.N. & Steel, R. (Archaeological Resource Management). 1995. *Archaeological Ruins at Lancaster Quarry, Harrismith* (SAHRA reference: 1995-SAHRA-0027);
- Nel, J. (Archaic Heritage Project Management). 2007. *Recommendation of Exemption – Above Ground Sasol Fuel Storage Tanks Located at Grain Silos in Localities in the Eastern Free State* (SAHRA reference: 2007-SAHRA-0204);
- Rossouw, L. (National Museum, BFN). 2008a. *Phase 1 Archaeological Impact Assessment of 8 Gravel Quarries along the R34 between Memel and Vrede, Free State Province* (SAHRA reference: 2008-SAHRA-0056);
- Rossouw, L. (National Museum, BFN). 2008b. *Phase 1 Archaeological Impact Assessment of a Proposed Water Pipeline adjoining the R712 between Sterkfontein Dam and Puthaditjhaba* (SAHRA reference: 2008-SAHRA-0055);
- Van Schalkwyk, J.A. (National Cultural History Museum). 1998. *A Survey of Cultural Resources for the Proposed Braamhoek Pumped Storage Scheme, Free State / KwaZulu-Natal Border Area* (SAHRA reference: 1998-SAHRA-0007); and
- Van Schalkwyk, J.A. & van den Bos, J. (National Cultural History Museum). 1999. *Scoping Report on Cultural Resources for the Proposed Clarens to Suikerbosrand Pipeline* (SAHRA reference: 1999-SAHRA-0077).

Of the abovementioned reports the De Brug 1020, Warden, study by Dreyer (2006c) directly overlaps the eastern extremity of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site. No archaeological or cultural heritage resources, as defined and protected y the NHRA 1999, were identified during the assessment.

A range of archaeological and cultural heritage resources have been located through CRM projects describing the greater cultural receiving environment of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site; with studies by Becker (2008) and Birkholtz & van der Walt (2006) of particular significance, describing in both cases the identification of a full range of archaeological resources including Stone Age, Iron Age and Colonial Period sites as well as related cemeteries and graves. Becker (2008) and Birkholtz & van der Walt (2006) identified Stone Age sites, while the general Stone Age record is complimented by the identification of a rock shelter by van Schalkwyk (1998) and at least 2 Rock Art sites by Dreyer (2005a, 2007b). Ample Iron Age remains are known from the greater area, reported on by Becker (2008), Birkholtz & van der Walt (2006), Huffman & Steel (1995) and Rossouw (2008b). Colonial Period remains comprise the most prominent category of identified resources, reported on by Becker (2008), Birkholtz & van der Walt (2006), Dreyer (2003, 2006a, 2006b, 2007b) and Rossouw (2008b), while the Becker (2008) study also exemplifies the presence of Colonial Period remains specifically pertaining to the Anglo-Boer War. Grave and cemetery sites were identified by Becker (2008), Birkholtz & van der Walt (2006), Dreyer (2005a, 2006b) and Rossouw (2008b).

[The National Museum, Bloemfontein, the SAHRA accredited Regional Data Recording Centre for the Free State region was contacted (2012-05-11) with regards to database access (SAHRA 2007). At the time of submission of this report, without a response from the museum, database access could not be obtained.]

2.2) THE PHASE 1 ARCHAEOLOGICAL IMPACT ASSESSMENT

Figure 4: Summary of the Phase 1 AIA assessment findings

Phase 1 AIA assessment findings indicate the eastern extremity of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site as archaeologically sensitive. Three archaeological and cultural heritage sites (Sites CRD-E.1, CRD-E.2 and CRD-E.3), as defined and protected by the NHRA 1999, are situated in direct and close proximity to the study site. In addition 2 archaeological sites (Iron Age 1 and Iron Age 2) were identified by means of aerial imagery, situated within relative proximity to the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site and in more direct relation to the planned 71.6ha Cornelis River dam project area, thus not forming part of the scope of this study, but serving to further describe the general archaeological sensitivity of the greater cultural receiving environment.

The 3 archaeological and cultural heritage sites identified within direct and close proximity to the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site can briefly be summarized as:

- **Site CRD-E.1 – Iron Age – Workers Village (S27°50'11.0"; E29°01'19.1"):**

Site CRD-E.1 is situated immediately adjacent to the proposed rising main and in close proximity to the Ezenzeleni pump station. Phase 2 archaeological mitigation and monitoring together with the implementation of formal and temporary conservation measures are recommended. Alternatively the developer may consider realignment of the rising main, and if necessary, relocation of the proposed Ezenzeleni pump station locality (Realignment Option 1), to coincide with formal conservation of Site CRD-E.1. The site should be permanently sign posted.

- **Site CRD-E.2 – Colonial Period – Farmstead (S27°50'09.9"; E29°01'11.3"):**

Current alignment of the rising main runs through Site CRD-E.2, impacting only on Feature 2.6 of the widespread site features. Phase 2 archaeological monitoring together with formal conservation of Feature 2.7, temporary conservation of Features 2.5 and 2.7 and destruction of Feature 2.6 under a SAHRA Site Destruction Permit would

be necessary. Alternatively the developer may opt for realignment of the rising main as heritage conservation measure (Realignment Option 2). Realignment will need to coincide with formal conservation of Feature 2.7. The site should be permanently sign posted.

- **Site CRD-E.3 – Later Stone Age (LSA) – Rock Art (S27°50'12.5"; E29°01'02.6"):**

Site CRD-E.3 is situated approximately 200m from the proposed rising main. Sensitivity relating to the conservation of painted Rock Art panels necessitates further conservation measures. It is recommended that the developer ensures that a basic Rock Art conservation / management plan be prepared for the site prior to development impact. The site should be permanently sign posted.

In addition to the abovementioned sites 2 more archaeological sites were identified through aerial imagery. Sites Iron Age 1 (S27°50'16.5"; E29°01'30.8") and Iron Age 2 (S27°50'26.0"; E29°01'23.7") are both situated approximately 400m from the proposed study site and will not be impacted on by the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme.* Both sites however fall within the general vicinity of the planned 71.6ha Cornelis River dam study site. The sites are identifiable by means of aerially visible Iron Age settlement remains including what may be interpreted as clusters of circular stone walling. Both sites fall outside the scope of this project and neither were inspected. Site localities do however serve to further describe the general archaeological and specifically Iron Age sensitivity of the greater project area.

Figure 5: Realignment Option 1 and Option 2 in relation to the current rising main Nodes 1-2-7

2.2.1) The Cornelis River Dam - Ezenzeleni Water Line Route (Gravity and Rising Mains)

Three archaeological and cultural heritage sites, as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the water line route. Identified sites are clustered towards the eastern extremity of the study site and summarized as:

1. Site CRD-E.1 – Iron Age – Workers Village (S27°50'11.0"; E29°01'19.1");
2. Site CRD-E.2 – Colonial Period – Farmstead (S27°50'09.9"; E29°01'11.3"); and
3. Site CRD-E.3 – Later Stone Age (LSA) – Rock Art (S27°50'12.5"; E29°01'02.6").

The remainder of the line route proved to be anthropogenically of low significance, characterized by a number of old monolithic sandstone fence posts and a contemporary farm access gate.

General view – vicinity of Nodes 1-2

General view – vicinity of Node 10

A contemporary farm access gate along the line route

Monolithic sandstone fence posts along the line route

General view – vicinity of Node 27

General view – vicinity of Node 25

Figure 6: Image gallery – Cornelis River Dam – Ezenzeleni Water Line Route

- *Site CRD-E.1 - Iron Age - Workers Village - S27°50'11.0"; E29°01'19.1"*

Figure 7: General locality of Site CRD-E.1

Site CRD-E.1 (S27°50'11.0"; E29°01'19.1"), situated on the property Uitspan Klipheuwels 239 constitutes an Iron Age worker's village dating to Colonial Period times. The site measures roughly 60x40m in size, with site components situated in close proximity to one another. Site CRD-E.1 comprises of the remains of at least 6 rectangular stone walled dwelling remains, measuring roughly 6x3m in size each. In addition to the dwelling remains 2 additional features identified only by slight hollows may represent further structure remains, 1 of which is associated with partial foundation stone wall remains. A series of ashy deposits, measuring more or less 8x3m in extent, situated towards the center of the site may indicate either former stock enclosure localities or alternatively be indicative of fairly extensive occupation of the site. Rough circular disturbances towards the south of the site may represent associated stock enclosures. No graves were found in association with the Iron Age workers village. Site CRD-E.1 may be associated with further Iron Age settlement type remains, indicated as Iron Age 1 and Iron Age 2 (see Figure 4), identified on aerial imagery and situated approximately 400m from the proposed study site. These 2 localities, situated outside the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site were not inspected during the Phase 1 AIA: The Iron Age 1 and Iron Age 2 localities are associated with the 71.6ha Cornelis River dam project area.

The proposed rising main will pass immediately west of Site CRD-E.1. Though development will not directly impact on the site, proximity of the site to the development alignment is of crucial concern and measures will need to be taken to ensure the conservation of the site. Site components are in an advanced state of decay and not visibly easily recognizable, permanent conservation measures would be necessary to ensure site conservation, not only pertaining to the construction phase, but also the implementation phase of the development.

RECOMMENDATIONS:

The Site CRD-E.1 Iron Age workers village is ascribed a SAHRA *Medium Significance* and a *Generally Protected B Field Rating*. Development will not directly impact on the site. However, proximity of the site to the proposed development alignment is of crucial concern. SAHRA recommendations as well as engineering specifications, specifically relating to landscape gradient and the locality of the Ezenzeleni pump station need to be taken into account in providing a feasible way forward for the development. It is recommended that both a Phase 2 mitigation and monitoring and a full conservation option be considered. The site should be permanently sign posted.

- **Phase 2 mitigation / development according to the current development design:**

Phase 2 archaeological mitigation should at minimum include –

1. Detailed map of the site;
2. Basic site management plan;
3. On-site monitoring at the time of development impact in the vicinity of Site CRD-E.1.
4. Submission of a monitoring report to the SAHRA APM Unit.

The developer should ensure that –

1. Formal conservation of Site CRD-E.1 (formal fence with access gate) be done prior to development impact;
2. Temporary conservation measures be in place during construction impact (clear visual demarcation with danger tape or construction netting together with temporary signage reading *'No Entry: Heritage / Archaeological Sensitive Area*'); and
3. The site should be permanently sign posted.

OR

- **Full site conservation / realignment of the rising main:**

1. Realignment of the rising main to ensure a heritage conservation corridor of at least 50m from the site (see Realignment Option 1) (see Figure 5);
2. Permanent conservation measures (permanent fence with access gate) should be in place prior to development impact in the vicinity of the site; and
3. The site should be permanently sign posted.

General view of Site CRD-E.1 – 1

General view of Site CRD-E.1 – 2

Close-up of site features – 1

Close-up of site features – 2

Close-up of site features – 3

Close-up of site features – 4

Close-up of site features – 5

Ashy deposits towards the center of the site

Figure 8: Image gallery – Site CRD-E.1

- *Site CRD-E.2 - Colonial Period - Farmstead - S27°50'09.9"; E29°01'11.3"*

Figure 9: General locality of Site CRD-E.2

Site CRD-E.2, situated at S27°50'09.9"; E29°01'11.3" on the property Uitspan Klipheuwels 239, represents the early Pieters Colonial Period farmstead. The date of origin of the site is not known (no CSG Record for the property), but a rough minimum mid 1800's to early 1900's date can be inferred from the Feature 2.7 cemetery.

The site is characterized by widespread site components; including the stone built stock enclosure complex, comprising of 3 clearly visible adjoining camps and indications to the south-west of 2 smaller adjoining stock camps, most probably used for calf management (CRD-E.2 – S27°50'09.9"; E29°01'11.3"; site co-ordinate). Feature 2.1 (S27°50'11.5"; E29°01'09.1") represents the locality of the former residence, situated approximately 65m to the south-west of the stock enclosures. Residence remains are characterized by the originally plastered sandstone block built walls of an approximate 7 roomed house. Only the walls are still standing, with the roof, doors and windows having been removed (decayed) in the interim. At the eastern side of the house it is evident that later period reparations were done with mud-brick only with the 2 eastern most rooms, inferred to have been later additions, having eroded down to simple mound remains. North of the residence Feature 2.2 (S27°50'10.3"; E29°01'08.7"), characterized by an approximate 3x3m area of overgrown vegetation, is interpreted as a former small branch built enclosure. Additional stock enclosures are evidenced by Feature 2.3 (S27°50'10.7"; E29°01'03.9"), comprising of the remains of a stone built stock enclosure situated along the slopes of the sandstone outcrops and Feature 2.4 (S27°50'08.6"; E29°01'02.0"), characterized by a pile of stones, indicative of the remains of a roughly 4x4m in size stone walled stock enclosure. A standing monolithic sandstone marker, inferred to be in its original position and 2 additional markers, but evidently in ex-situ context, is interpreted as the remains of the original entrance to the farmstead. Overgrown vegetation has already taken its toll in the Feature

2.5 (S27°50'06.2"; E29°01'04.9") farmstead entrance. Feature 2.6 (S27°50'06.8"; E29°01'08.0) is identifiable by a sandstone marker associated with a slight indenture, inferred to represent the locality of a former cattle ramp. The farmstead cemetery, Feature 2.7 (S27°50'06.2"; E29°01'11.1"), is situated to the north-east of the site. The cemetery is typified by a series of monolithic sandstone fence posts, indicating that the cemetery was originally fenced, but with the fence largely deteriorated at the time of the assessment. Three graves are situated within the cemetery, including 2 singe and a double grave: The inscription on the 1st gravestone has deteriorated in totality. The 2nd grave is demarcated by a gravestone with an inscription reading: '*Hier rust Magdalena S.P. Pieters. Geb – 13 Jun 1925. Ovl – 18 Dec 1925…*' (with the remainder of the inscription obscured by overburden). The 3rd or double grave, marked by a granite gravestone contains the inscription: '*Hier rus ons beminde ouers. Vader – Hermanus Bernardus Pieters. Geb. 16 Aug 1839. Oorl. 8 Des 1912. Ges. 129 v. 2. Moeder – Magdalena Susanna Pieters (Geb. Pitzer). Geb. 27 Feb 1853. Oorl. 14 Jan 1945. Ges. 180 v. 3. Rus in Vrede.*'

The current rising main alignment runs through the site, impacting on the Feature 2.6 cattle ramp remains and being situated approximately 7m from the Feature 2.5 farmstead entrance. The alignment is in fairly safe distance from the most important site features being positioned approximately 70m north of the stock enclosures (Site CRD-E.2), 130m north of the main residence (Feature 2.1) and 50m south of the cemetery (Feature 2.7).

RECOMMENDATIONS:

The Site CRD-E.2 Colonial Period farmstead is ascribed a SAHRA overall *Medium Significance* and a *Generally Protected B Field Rating*. However, varying site significance ratings do apply to varying site components affected by the current rising main alignment: Development will directly impact on the Feature 2.6 cattle ramp. Feature 2.6 is ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*, while impacting also in close proximity to the Feature 2.5 entrance remains, again ascribed a SAHRA *Low Significance* and a *Generally Protected C Field Rating*. The Feature 2.7 cemetery is ascribed a SAHRA *High Significance* and a *Generally Protected A Field Rating*. The Feature 2.1 structure remains, comprising of a structure pre-dating 60 years of age, receives automatic SAHRA protection as a site of *High Significance* with a *Provincial Grade 2 Field Rating* (the Feature 2.1 structure is architecturally of Low – Medium Significance). Based on the widespread site features comprising Site CRD-E.2 associated with intricate landscape gradient, formal conservation of the site as a single entity is not recommended. SAHRA recommendations as well as engineering specifications, specifically relating to landscape gradient need to be taken into account in providing a feasible way forward for the development. It is recommended that both a Phase 2 mitigation and a full conservation option be considered. The site should be permanently sign posted.

- **Phase 2 mitigation / development according to the current development design:**

Phase 2 archaeological mitigation should at minimum include –

1. On-site monitoring at the time of development impact in the vicinity of Site CRD-E.2.
2. Submission of a monitoring report to the SAHRA APM Unit.

The developer should ensure that –

1. Destruction of the Feature 2.6 cattle ramp be done under a SAHRA Site Destruction Permit;
2. Formal conservation of the Feature 2.7 cemetery (formal fence with access gate) be done prior to development impact;
3. Temporary conservation measures be in place at Features 2.5 and 2.7 during construction impact (clear visual demarcation with danger tape or construction netting together with temporary signage reading '*No Entry: Heritage / Archaeological Sensitive Area*'); and
4. The site should be permanently sign posted.

OR

- **Full site conservation / realignment of the rising main:**
  1. Realignment of the rising main to ensure a heritage conservation corridor of at least 50m from the northern most site features (see Realignment Option 2) (see Figure 5);
  2. Formal conservation of the Feature 2.7 cemetery (formal fence with access gate); and
  3. The site should be permanently sign posted.

 View of the CRD-E.2 stock enclosures – 1	 View of the CRD-E.2 stock enclosures – 2
 General view of the Feature 2.1 residence – 1	 General view of the Feature 2.1 residence – 2
 Close-up of the Feature 2.1 residence	 View of the Feature 2.2 enclosure remains

General view of the Feature 2.3 stock enclosure

Remains of the Feature 2.4 enclosure

Remains of the Feature 2.5 farmstead entrance

General view of the Feature 2.6 cattle ramp remains

General view of the Feature 2.7 cemetery – 1

General view of the Feature 2.7 cemetery – 2

The 2 single graves at the feature 2.7 cemetery

Gravestone of the double grave

Figure 10: Image gallery – Site CRD-E.2

- *Site CRD-E.3 - Later Stone Age (LSA) - Rock Art - S27°50'12.5"; E29°01'02.6"*

Figure 11: General locality of Site CRD-E.3

The Site CRD-E.3 (S27°50'12.5"; E29°01'02.6") Rock Art panel is situated at the southern extremity of a shallow sandstone overhang on the property Uitspan Klipheuwels 239. The overhang measures approximately 10+m in length with an average depth of 1m. Deposits are characterized by flaked sandstone only. However, the anthropogenic sterile overburden may well cover underlying associated Later Stone Age (LSA) archaeological deposits. The Site CRD-E.3 painted Rock Art panel measures more or less 40x20cm in size. The fairly well conserved painting is typified by the characteristic overly of human and animal figures; distinguished by the image of a large eland placed to the left of the panel, flanked by an eroding eland figure to the left thereof, 2 further animal images to the right, 1 with a zig-zag mane and a smaller antelope above the main animal section of the painting. Traces of additional eroded animal imagery (yellow coloration) are situated to the bottom right of the abovementioned composition. From left to right human figurines increasingly dominate the panel, counting at least 21 clearly identifiable figures, in leading singular alignment to the right of the panel, where layered imagery again becomes more prominent. The heads of many human figurines may well have been painted in white, with the white paint having totally decayed leaving only post-cranial portrayals of many figurines. Human figures are primarily painted in red; animal figures in yellow and black.

The Site CRD-E.3 Rock Art panel is situated approximately 200m south of the proposed development alignment, and approximately 180m north of the Cornelis River, overlooking the river valley from the sandstone outcrops.

RECOMMENDATIONS:

The Site CRD-E.3 LSA Rock Art panel is ascribed a SAHRA *High Significance* and a *Generally Protected A Field Rating.* The site will not be impacted on by development. Proximity of the proposed development to the Rock Art site does necessitate additional conservation measures prior to development, including a basic Rock Art Conservation / Management Plan (to be compiled by a Rock Art specialist) and permanent sign posting of the site. The management plan should at minimum include:

1. Additional photographic documentation and scientific tracing of the panel;
2. Basic Rock Art conservation / management plan;
3. Inclusion of the site in an active Rock Art research database, including submission of the site to the national South African Rock Art Digital Archive (SARADA) database; and
4. Submission of the management plan to the SAHRA APM Unit.

General view of the shelter overhang

General view of the CRD-E.3 Rock Art panel

Close-up of the CRD-E.3 Rock Art panel

Panel details – 1

Panel details – 2

View from Site CRD-E.3

Figure 12: Image gallery – Site CRD-E.3

2.2.2) Ezenzeleni Pump Station – S27°50'12.7"; E29°01'17.9"

Figure 13: General locality of the Ezenzeleni Pump Station

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the approximate 30x30m Ezenzeleni Pump Station study site. Identified Site CRD-E.1 is situated in close proximity to the study site (for a site description and relevant recommendations see Site CRD-E.1 pp 15-17).

RECOMMENDATIONS:

It is recommended that development of the Ezenezeleni Pump Station proceeds as applied for provided the developer comply with relevant recommendations pertaining to Site CRD-E.1 or that the development be relocated in accordance with the proposed Realignment Option 1 line route (see Figure 5).

View over the Cornelis River valley

General view

Figure 14: Image gallery – Ezenzeleni Pump Station

2.2.3) Ezenzeleni Water Treatment Works (WTW) – S27°49'47.6"; E29°00'54.1"

Figure 15: General locality of the Ezenzeleni WTW

No archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, were identified during the Phase 1 AIA of the approximate 2ha Ezenzeleni Water Treatment Works (WTW) study site.

RECOMMENDATIONS:

It is recommended that development of the Ezenezeleni WTW proceeds as applied for without the developer having to comply with additional cultural heritage compliance requirements.

Ezenzeleni WTW – 1

Ezenzeleni WTW – 2

Figure 16: Image gallery – Ezenzeleni WTW

3) CONCLUSION AND RECOMMENDATIONS

With reference to cultural heritage compliance, as per the requirements of the NHRA 1999, it is recommended that the proposed *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme,* Warden, Free State, proceeds as applied for, provided the developer complies with the following recommendations:

Phase 1 AIA assessment findings indicate the eastern extremity of the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site as archaeologically sensitive. Three archaeological and cultural heritage sites (Sites CRD-E.1, CRD-E.2 and CRD-E.3), as defined and protected by the NHRA 1999, are situated in direct and close proximity to the study site. In addition 2 archaeological sites (Iron Age 1 and Iron Age 2) were identified by means of aerial imagery, situated within relative proximity to the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site and in more direct relation to the planned 71.6ha Cornelis River dam project area, thus not forming part of the scope of this study, but serving to further describe the general archaeological sensitivity of the greater cultural receiving environment.

The 3 archaeological and cultural heritage sites identified within direct and close proximity to the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme* project study site can briefly be summarized as:

- **Site CRD-E.1 – Iron Age – Workers Village (S27°50'11.0"; E29°01'19.1"):**

Site CRD-E.1 is situated immediately adjacent to the proposed rising main and in close proximity to the Ezenzeleni pump station. Phase 2 archaeological mitigation and monitoring together with the implementation of formal and temporary conservation measures are recommended. Alternatively the developer may consider realignment of the rising main, and if necessary, relocation of the proposed Ezenzeleni pump station locality (Realignment Option 1), to coincide with formal conservation of Site CRD-E.1. The site should be permanently sign posted.

- **Site CRD-E.2 – Colonial Period – Farmstead (S27°50'09.9"; E29°01'11.3"):**

Current alignment of the rising main runs through Site CRD-E.2, impacting only on Feature 2.6 of the widespread site features. Phase 2 archaeological monitoring together with formal conservation of Feature 2.7, temporary conservation of Features 2.5 and 2.7 and destruction of Feature 2.6 under a SAHRA Site Destruction Permit would be necessary. Alternatively the developer may opt for realignment of the rising main as heritage conservation measure (Realignment Option 2). Realignment will need to coincide with formal conservation of Feature 2.7. The site should be permanently sign posted.

- **Site CRD-E.3 – Later Stone Age (LSA) – Rock Art (S27°50'12.5"; E29°01'02.6"):**

Site CRD-E.3 is situated approximately 200m from the proposed rising main. Sensitivity relating to the conservation of painted Rock Art panels necessitates further conservation measures. It is recommended that the developer ensures that a basic Rock Art conservation / management plan be prepared for the site prior to development impact. The site should be permanently sign posted.

In addition to the abovementioned sites 2 more archaeological sites were identified through aerial imagery. Sites Iron Age 1 (S27°50'16.5"; E29°01'30.8") and Iron Age 2 (S27°50'26.0"; E29°01'23.7") are both situated approximately 400m from the proposed study site and will not be impacted on by the *Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme.* Both sites however fall within the general vicinity of the planned 71.6ha Cornelis River dam study site. The sites are identifiable by means of aerially visible Iron Age settlement remains including what may be interpreted as clusters of circular stone walling. Both sites fall outside the scope of this study and neither were inspected. Site localities do however serve to further describe the general archaeological and specifically Iron Age sensitivity of the greater project area.

CORNELIS RIVER DAM – EZENZELENI: PHUMELELA BULK WATER SUPPLY SCHEME					
WARDEN, PHUMELELA LOCAL MUNICIPLAITY, FREE STATE					
MAP CODE	*SITE*	*TYPE / PERIOD*	*DESCRIPTION*	*CO-ORDINATES*	*PRELIMINARY RECOMMENDATIONS*
CORNELIS RIVER DAM TO EZENZELENI WATER LINE ROUTE (GRAVITY AND RISING MAINS)					
1	Node 1	-	-	S27°50'12.7"; E29°01'17.9"	-
2	Node 2	-	-	S27°50'09.7"; E29°01'17.5"	-
7	Node 7	-	-	S27°50'02.1"; E29°00'52.7"	-
10	Node 10	-	-	S27°49'47.6"; E29°00'54.1"	-
11	Node 11	-	-	S27°49'47.0"; E29°00'51.9"	-
12a	Node 12a	-	-	S27°49'49.0"; E29°00'36.5"	-
14	Node 14	-	-	S27°49'57.5"; E29°00'15.4"	-
15	Node 15	-	-	S27°49'56.5"; E29°00'15.1"	-
17a	Node 17a	-	-	S27°50'04.8"; E28°59'53.5"	-
19a	Node 19a	-	-	S27°50'08.7"; E28°59'17.6"	-
21	Node 21	-	-	S27°50'19.1"; E28°59'05.3"	-
25	Node 15	-	-	S27°50'34.8"; E28°58'41.7"	-
26	Node 26	-	-	S27°50'13.9"; E28°59'05.2"	-
27	Node 27	-	-	S27°50'13.7"; E28°59'05.8"	-
CRD-E.1	**Site CRD-E.1**	Iron Age	Workers Village	S27°50'11.0"; E29°01'19.1"	*Phase 2 archaeological mitigation & monitoring; Formal conservation ; Temporary conservation & Permanent sign posting* ***OR*** *Realignment of the rising main (and relocation of the Ezenzeleni pump station) [Realignment Option 1]; Formal conservation & Permanent sign posting*
CRD-E.2	**Site CRD-E.2**	Colonial Period	Farmstead	S27°50'09.9"; E29°01'19.1"	*Phase 2 archaeological monitoring; Formal conservation: Feature 2.7; Temporary conservation: Features 2.5 & 2.7; Site Destruction (SAHRA Permit): Feature 2.6 & Permanent sign posting* ***OR*** *Realignment of the rising main [Realignment Option 2]; Formal conservation: Feature 2.7 & Permanent sign posting*
-	**CRD-E2**	-	Stock enclosures	S27°50'09.9"; E29°01'19.1"	
-	**Feature 2.1**	-	Residence	S27°50'11.5"; E29°01'09.1"	
-	**Feature 2.2**	-	Stock enclosures	S27°50'10.3"; E29°01'08.7"	
-	**Feature 2.3**	-	Stock enclosures	S27°50'10.7"; E29°01'03.9"	
-	**Feature 2.4**	-	Stock enclosures	S27°50'08.6"; E29°01'02.0"	
-	**Feature 2.5**	-	Entrance	S27°50'06.2"; E29°01'04.9"	
-	**Feature 2.6**	-	Cattle ramp	S27°50'06.8"; E29°01'08.0"	
-	**Feature 2.7**	-	Cemetery	S27°50'06.2"; E29°01'11.1"	
CRD-E.3	**Site CRD-E.3**	LSA	Rock Art	S27°50'12.5"; E29°01'02.6"	*Phase 2 compilation of basic Rock Art conservation / management plan & Permanent sign posting*
Iron Age 1	**Iron Age 1**	Iron Age	Settlement	S27°50'16.5"; E29°01'30.8"	*N/A (Outside project study site)*
Iron Age 2	**Iron Age 2**	Iron Age	Settlement	S27°50'26.0"; E29°01'23.7"	*N/A (Outside project study site)*
EZENZELENI PUMP STATION – S27°50'12.7"; E29°01'17.9"					
CRD-E.1	**Site CRD-E.1**	Iron Age	Workers Village	S27°50'11.0"; E29°01'19.1"	*See above recommendations - Site CRD-E.1*
EZENZELENI WATER TREATMENT WORKS (WTW) – S27°49'47.6"; E29°00'54.1"					
-	-	-	-	-	*N/A*

Table 2: Development and Phase 1 AIA assessment findings – co-ordinate details

- **Sign Posting:** Sign posting is not at present defined by SAHRA and the following can be used as guideline: Signs should indicate that the sites are formally protected under the NHRA 1999 and that any damage thereto or impact thereon is prohibited by law. In addition the signs should indicate a reference for purposes of future identification. Sign boards can be in the region of approximately 60-80cm x 40-50cm in size which will provide for a reasonable size sign with clear legible lettering. Sign boards are usually done by professional sign writers (durability) on a metal board and fixed to a treated wooden or metal pole. Sign boards can be in a basic color (black / white / green / blue) with any font type (lettering in black / white). It is recommended that sign posts be done in English.

IRON AGE *(Site type / period identification)*

Cornelis River Dam – Ezenzeleni: Phumelela Bulk Water Supply Scheme
(Project Name)
Site CRD-E.1 *(Site number / name)*

THIS SITE IS FORMALLY PROTECTED BY SAHRA
UNDER THE
NATIONAL HERITAGE RESOURCES ACT, NO 25 OF 1999

Any unauthorized impact thereon or damage thereto is prohibited by law

Figure 17: Recommended heritage sign posting

NOTE: Should any archaeological or cultural heritage resources, as defined and protected by the NHRA 1999, and not reported on in this report be identified during the course of development the developer should immediately cease operation in the vicinity of the find and report the site to SAHRA / an ASAPA accredited CRM archaeologist.

4) REFERENCES

1. RudNat. 2012. *Background Report: Phumelela Regional Bulk Water Supply Scheme: Construction Water Storage Facility at Warden and Pipeline from Dam to Warden.* (Unpublished report).

2. South African Government. (No. 107) of 1998. *National Environmental Management Act*.

3. South African Government. (No. 25) of 1999. *National Heritage Resources Act*.

4. South African Heritage Resources Agency. 2007. *Minimum standards for the archaeological and heritage components of impact assessments*. (Unpublished guidelines.)

APPENDIX - A -

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 30,000km². 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 tones 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

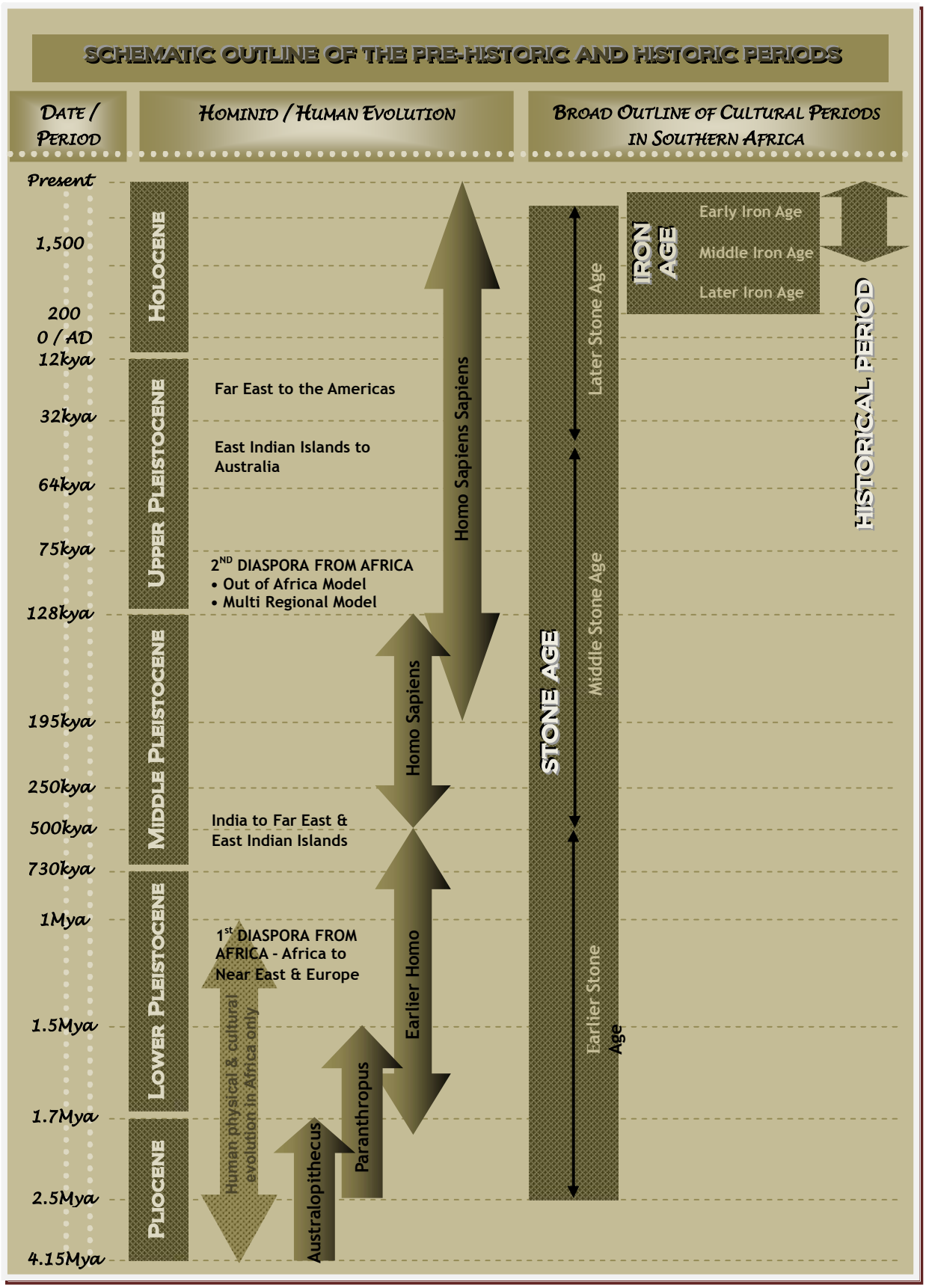
From the late 1600's conflict between migrants from the Cape (predominantly Boers) and Xhosa people in the region of the Fish River were strife, ultimately resulting in a series of 9 Frontier Wars (1702-1878) (Milton 1983). Both cultures were heavily based and reliant on agriculture and cattle farming. 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'.


SCHEMATIC OUTLINE OF THE PRE-HISTORIC AND HISTORIC 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
Early Iron Age
Middle Iron Age
Later Iron Age
HISTORICAL PERIOD

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APPENDIX - B -

EXTRACTS FROM THE NATIONAL HERITAGE RESOURCES ACT, NO 25 OF 1999

DEFINITIONS
Section 2

In this Act, unless the context requires otherwise:

ii. "*Archaeological*" means –
- a) material remains resulting from human activity which are in a state of disuse and are in or on land and which are older than 100 years, including artefacts, human and hominid remains and artificial features and structures;
- b) rock art, being any form of painting, engraving or other graphic representation on a fixed rock surface or loose rock or stone, which was executed by human agency and which is older than 100 years, including any area within 10 m of such representation;
- c) wrecks, being any vessel or aircraft, or any part thereof, which was wrecked in South Africa, whether on land, in the internal waters, the territorial waters or in the maritime culture zone of the Republic,… and any cargo, debris, or artefacts found or associated therewith, which is older than 60 years or which SAHRA considers to be worthy of conservation.

viii. "*Development*" means any physical intervention, excavation or action, other than those caused by natural forces, which may in the opinion of a heritage authority in any way result in a change to the nature, appearance or physical nature of a place, or influence its stability and future well-being, including –
- a) construction, alteration, demolition, removal or change of use of a place or structure at a place;
- b) carrying out any works on or over or under a place;
- c) subdivision or consolidation of land comprising, a place, including the structures or airspace of a place;
- d) constructing or putting up for display signs or hoardings;
- e) any change to the natural or existing condition or topography of land; and
- f) any removal or destruction of trees, or removal of vegetation or topsoil;

xiii. "*Grave*" means a place of interment and includes the contents, headstone or other marker of such a place, and any other structure on or associated with such place;

xxi. "*Living heritage*" means the intangible aspects of inherited culture, and may include –
- a) cultural tradition;
- b) oral history;
- c) performance;
- d) ritual;
- e) popular memory;
- f) skills and techniques;
- g) indigenous knowledge systems; and
- h) the holistic approach to nature, society and social relationships.

xxxi. "*Palaeontological*" means any fossilised remains or fossil trace of animals or plants which lived in the geological past, other than fossil fuels or fossiliferous rock intended for industrial use, and any site which contains such fossilised remains or trance;

xli. "*Site*" means any area of land, including land covered by water, and including any structures or objects thereon;

xliv. "*Structure*" means any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith;

NATIONAL ESTATE
Section 3

1) For the purposes of this Act, those heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations must be considered part of the national estate and fall within the sphere of operations of heritage resources authorities.

2) Without limiting the generality of subsection 1), the national estate may include –
- a) places, buildings, structures and equipment of cultural significance;
- b) places to which oral traditions are attached or which are associated with living heritage;
- c) historical settlements and townscapes;
- d) landscapes and natural features of cultural significance;
- e) geological sites of scientific or cultural importance
- f) archaeological and palaeontological sites;
- g) graves and burial grounds, including –
  - i. ancestral graves;
  - ii. royal graves and graves of traditional leaders;
  - iii. graves of victims of conflict
  - iv. graves of individuals designated by the Minister by notice in the Gazette;
  - v. historical graves and cemeteries; and
  - vi. other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No 65 of 1983)
- h) sites of significance relating to the history of slavery in South Africa;
- i) movable objects, including –
  - i. objects recovered from the soil or waters of South Africa, including archaeological and palaeontological objects and material, meteorites and rare geological specimens;

ii. objects to which oral traditions are attached or which are associated with living heritage;
iii. ethnographic art and objects;
iv. military objects;
v. objects of decorative or fine art;
vi. objects of scientific or technological interest; and
vii. books, records, documents, photographic positives and negatives, graphic, film or video material or sound recordings, excluding those that are public records as defined in section 1 xiv) of the National Archives of South Africa Act, 1996 (Act No 43 of 1996).

STRUCTURES
Section 34

1) No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority.

ARCHAEOLOGY, PALAEONTOLOGY AND METEORITES
Section 35

3) Any person who discovers archaeological or palaeontological objects or material or a meteorite in the course of development or agricultural activity must immediately report the find to the responsible heritage resources authority, or to the nearest local authority offices or museum, which must immediately notify such heritage resources authority.
4) No person may, without a permit issued by the responsible heritage resources authority –
    a) destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;
    b) destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite;
    c) trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or palaeontological material or object, or any meteorite; or
    d) bring onto or use at an archaeological or palaeontological site any excavation equipment or any equipment which assists in the detection or recovery of metals or archaeological and palaeontological material or objects, or use such equipment for the recovery of meteorites.
5) When the responsible heritage resources authority has reasonable cause to believe that any activity or development which will destroy, damage or alter any archaeological or palaeontological site is under way, and where no application for a permit has been submitted and no heritage resources management procedure in terms of section 38 has been followed, it may –
    a) serve on the owner or occupier of the site or on the person undertaking such development an order for the development to cease immediately for such period as is specified in the order;
    b) carry out an investigation for the purpose of obtaining information on whether or not an archaeological or palaeontological site exists and whether mitigation is necessary;
    c) if mitigation is deemed by the heritage resources authority to be necessary, assist the person on whom the order has been served under paragraph a) to apply for a permit as required in subsection 4); and
    d) recover the costs of such investigation from the owner or occupier of the land on which it is believed an archaeological or palaeontological site is located or from the person proposing to undertake the development if no application for a permit is received within two weeks of the order being served.
6) The responsible heritage resources authority may, after consultation with the owner of the land on which an archaeological or palaeontological site or meteorite is situated, serve a notice on the owner or any other controlling authority, to prevent activities within a specified distance from such site or meteorite.

BURIAL GROUNDS AND GRAVES
Section 36

3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority –
    a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves;
    b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or
    c) bring onto or use at a burial ground or grave referred to in paragraph a) or b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.
4) SAHRA or a provincial heritage resources authority may not issue a permit for the destruction of any burial ground or grave referred to in subsection 3a) unless it is satisfied that the applicant has made satisfactory arrangements for the exhumation and re-interment of the contents of such graves, at the cost of the applicant and in accordance with any regulations made by the responsible heritage resources authority.
5) SAHRA or a provincial heritage resources authority may not issue a permit for any activity under subsection 3b) unless it is satisfied that the applicant has, in accordance with regulations made by the responsible heritage resources authority –
    a) made a concerted effort to contact and consult communities and individuals who by tradition have an interest in such grave or burial ground; and
    b) reached agreements with such communities and individuals regarding the future of such grave or burial ground.

6) Subject to the provision of any other law, any person who in the course of development or any other activity discovers the location of a grave, the existence of which was previously unknown, must immediately cease such activity and report the discovery to the responsible heritage resources authority which must, in co-operation with the South African Police Service and in accordance with regulations of the responsible heritage resources authority –
   a) carry out an investigation for the purpose of obtaining information on whether or not such grave is protected in terms of this Act or is of significance to any community; and
   b) if such grave is protected or is of significance, assist any person who or community which is a direct descendant to make arrangements for the exhumation and re-internment of the contents of such grave or, in the absence of such person or community, make any such arrangements as it deems fit.

HERITAGE RESOURCES MANAGEMENT
Section 38

1) Subject to the provisions of subsections 7), 8) and 9), any person who intends to undertake a development categorised 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.
2) The responsible heritage resources authority must, within 14 days of receipt of a notification in terms of subsection 1) –
   a) if there is reason to believe that heritage resources will be affected by such development, notify the person who intends to undertake the development to submit an impact assessment report. Such report must be compiled at the cost of the person proposing the development, by a person or persons approved by the responsible heritage resources authority with relevant qualifications and experience and professional standing in heritage resources management; or
   b) notify the person concerned that this section does not apply.
3) The responsible heritage resources authority must specify the information to be provided in a report required in terms of subsection 2a) …
4) The report must be considered timeously by the responsible heritage resources authority which must, after consultation with the person proposing the development decide –
   a) whether or not the development may proceed;
   b) any limitations or conditions to be applied to the development;
   c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;
   d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and
   e) whether the appointment of specialists is required as a condition of approval of the proposal.

APPOINTMENT AND POWERS OF HERITAGE INSPECTORS
Section 50

7) Subject to the provision of any other law, a heritage inspector or any other person authorised by a heritage resources authority in writing, may at all reasonable times enter upon any land or premises for the purpose of inspecting any heritage resource protected in terms of the provisions of this Act, or any other property in respect of which the heritage resources authority is exercising its functions and powers in terms of this Act, and may take photographs, make measurements and sketches and use any other means of recording information necessary for the purposes of this Act.
8) A heritage inspector may at any time inspect work being done under a permit issued in terms of this Act and may for that purpose at all reasonable times enter any place protected in terms of this Act.
9) Where a heritage inspector has reasonable grounds to suspect that an offence in terms of this Act has been, is being, or is about to be committed, the heritage inspector may with such assistance as he or she thinks necessary –
   a) enter and search any place, premises, vehicle, vessel or craft, and for that purpose stop and detain any vehicle, vessel or craft, in or on which the heritage inspector believes, on reasonable grounds, there is evidence related to that offence;
   b) confiscate and detain any heritage resource or evidence concerned with the commission of the offence pending any further order from the responsible heritage resources authority; and
   c) take such action as is reasonably necessary to prevent the commission of an offence in terms of this Act.
10) A heritage inspector may, if there is reason to believe that any work is being done or any action is being taken in contravention of this Act or the conditions of a permit issued in terms of this Act, order the immediate cessation of such work or action pending any further order from the responsible heritage resources authority.