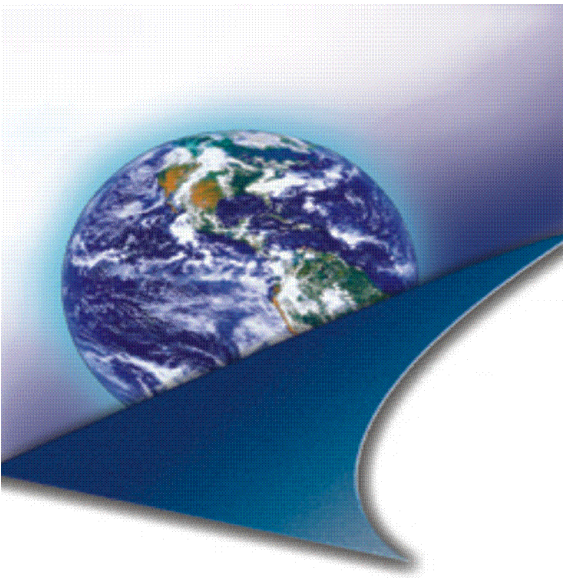

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HERITAGE RESOURCE MANAGEMENT PLAN

ANNEXURE D

CONSTRUCTION:

THE NORTHERN AQUEDUCT AUGMENTATION

PHASE 4 PROJECT, KWAZULU-NATAL

EIA Ref Number: **DM/0065/2012**

Date: **May 2013**

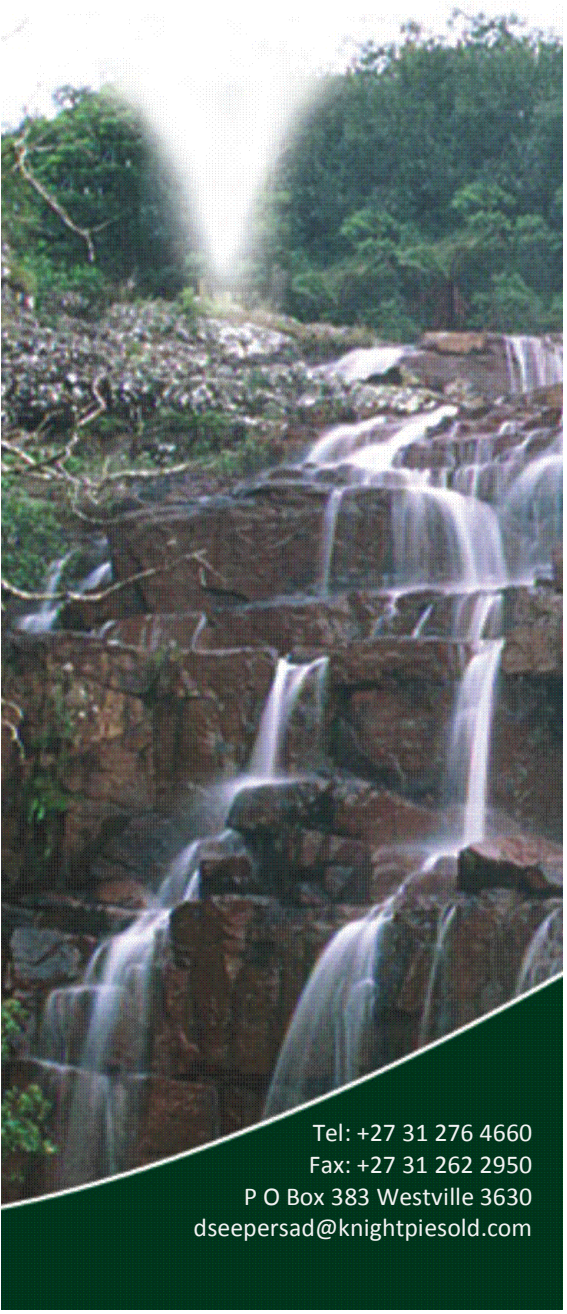
On Behalf of: **EThekwini Water & Sanitation**

ETHEKWINI MUNICIPALITY

Prepared by:

Knight Piésold Environmental Scientists:
Deepa Seepersad

KP Ref Number: **303-00213.03**



Tel: +27 31 276 4660
Fax: +27 31 262 2950
P O Box 383 Westville 3630
dseepersad@knightpiesold.com

Knight Piésold CONSULTING

CONTENTS

i. KEY TO ACRONYMS AND ABBREVIATIONS

Amafa	Amafa aKwaZulu-Natali (KwaZulu-Natal Heritage Regulating Authority)
CP	Communications Plan
DAEARD	Department of Agriculture, Environmental Affairs and Rural Development
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EIRF	Environmental Incident Report File
EMP	Environmental Management Plan
EWS	EThekwini (Municipality) Water & Sanitation
HMP	Heritage Resource Management Plan
IAPs	Interested and Affected Parties
KP	Knight Piésold Consulting
KZN	KwaZulu-Natal
KZNHA	KwaZulu-Natal Heritage Act No. 4 of 2008 (replacing KZNHA No. 10 of 1997)
NAA	Northern Aqueduct Augmentation (with reference to the eThekwini Municipality pipeline)
NEMA	National Environmental Management Act (No. 107 of 1998)
NHCA	National Heritage Council Act (No. 11 of 1999)
NHRA	National Heritage Resources Act (No.25 of 1999)
RoD	Record of Decision (Environmental Authorization, October 2008)
SAHRA	South African Heritage Resources Agency (National Heritage Regulating Authority)
SDMP	Spoil Disposal Management Plan
WA	Western Aqueduct (with reference to the eThekwini Municipality pipeline)

ii. GLOSSARY OF TERMS & ABBREVIATIONS

a. Parties Involved

All staff: The entire workforce and project team appointed by the Developer to implement the project. Sub-contractors, service or product providers / suppliers, artisans and workers employed by the Contractor, Consulting Engineers or Environmental Consultants, and persons visiting or making deliveries to the site.

Amafa: Refer 'Abbreviations / Acronyms' above and 'Heritage Regulating Authority' below. For the purposes of this document, 'Amafa' refers to representatives of Amafa aKwaZulu-Natali or the KwaZulu-Natal Heritage Regulating Authority.

Community Liaison Officer: For the purpose of this document, the term 'CLO' refers to the Municipal Representative tasked with assisting in community communication and notification procedures.

Consulting Engineers: Engineers responsible for engineering design and/or implementation of the project.

Contractor: For the purposes of this document, the term 'Contractor' refers to the main contractor(s) appointed to undertake the construction of the project, or portion of the construction of the project. The Contractor(s) are required to adhere to the Environmental Management Plan (EMP) and are responsible for ensuring that all sub-contractors, suppliers and staff appointed by them also adhere to the conditions of the EMP.

DAEARD: Refer 'Abbreviations / Acronyms' above. For the purposes of this document, 'DAEARD' refers to representatives of the KZN Department of Agriculture and Environmental Affairs.

Developer (or Proponent): The client (an individual or group), whom is responsible for the planning, funding and development of the project. In this case, eThekwini Municipality Water & Sanitation.

Engineer's Representative (ER): For the purposes of this document, the 'ER' refers to the individual appointed by the Consulting Engineers to oversee the implementation of the construction phase of the project, including the rescue and rehabilitation phases.

Environmental Consultant: The individual or company responsible for the development of the Environmental Management Plan (EMP) which includes the Plant Rescue and Rehabilitation Plan, Communications Plan, Spoil Disposal Management Plan and Heritage Management Plan. The Environmental Consultant can also fulfil a role in the monitoring and auditing of the implementation of the EMP and Rescue and Rehabilitation Plan. For the purposes of this document, the term 'Environmental Consultant' refers to *Knight Piésold* Consulting.

Environmental Control Officer (ECO): For the purposes of this document, the 'ECO' refers to the individual appointed by the Developer to oversee the implementation of the Environmental Management Plan (EMP) on site by the various Contractors (refer above). The ECO is to be qualified in the environmental sciences, understand the detailed environmental issues associated with the development, and is to be well versed in the contents of the EMP and its associated reports. The ECO will be the liaison person between the Environmental

Site Officers (ESOs, refer below) of the contracting teams, and the Developer (refer above), the Consulting Engineers (refer above), the Rehabilitation Specialist (refer below), the Biodiversity Specialist (refer above) and the Environmental Consultant (refer above).

Environmental Site Officer (ESO): For the purposes of this document, the ESO is an individual appointed by the Contractor to represent the contracting team, and is to be responsible for ensuring the day-to-day implementation of the EMP on the site by the team in question. The ESO is to be qualified in the environmental sciences, informed of the contents of the Environmental Management Plan (EMP) relevant to the activities of the construction team in question, and is to understand the basic environmental issues associated with the development. The ESO is to report to the ECO (refer above) with regards to any environmental issues.

Heritage Regulating Authority: Refers to Amafa aKwaZulu-Natali (Amafa - see Acronyms / Abbreviations above) in the context of KwaZulu-Natal heritage resources, and the South African Heritage Resources Agency (SAHRA - see Acronyms / Abbreviations above) in the context of national heritage resources.

Heritage Specialist: For the purposes of this document, the term 'Heritage Specialist' refers to the main specialist appointed by the Environmental Consultants to undertake any investigations or research activities associated with the heritage resources identified in the vicinity of or within the working corridor. The Heritage Specialist is required to adhere to the Environmental Management Plan (EMP) and associated Heritage Resource Management Plan (HMP) and is responsible for ensuring all sub-specialists, sub-consultants, suppliers and staff appointed by them also adhere to the conditions of the EMP.

Interested & Affected Parties (I&APs): Any individual or group of individuals concerned with, interested in, or affected by the project and its consequences, including (but not restricted to) the local community and general public, government and local authorities, stakeholders, landowners, tribal authorities and public interest groups.

Project Manager: The person responsible for coordinating and integrating activities across multiple, functional lines.

b. About the Construction Activities

Active Sites (see also Work Fronts): The active sites are areas of the working corridor of pre-determined lengths where clearing activities, excavations, trench activities, reinstatement activities and rehabilitation activities are taking place. More than one active site may be operative along the route. The active sites are to be temporarily fenced, and all construction and rehabilitation related activities are to remain within the confines of the temporary boundary, and are to make use of access routes as determined for each active site. The active sites are also referred to as the Working Fronts (see below).

Barricades: For the purposes of heritage resource preservation, the following barricade is deemed appropriate:
-Barrier Fences – shall consist of 1.8m high Bonox type or similar approved fence type, of such configuration that animals cannot enter through the bottom section of the fence and that human beings cannot have free access. This barrier fence shall be supported with full length vertical droppers at intervals of 3 metres and Y standard stakes planted into the ground at intervals of 12 metres. Red and white danger tape shall be woven through the fence in order to increase visibility and the tape shall be secured in order to prevent loose ends from flapping in the wind or lying on the ground. Barrier fences shall typically be required in areas where work fronts are situated in

farm land, small holdings and other areas where agricultural activities are prevalent, or in the event that heritage or biodiversity resources are to be cordoned off and preserved.

Construction camp / site office: The areas / containers utilised for on-site staff offices (for engineers and contractors etc.) as well as to store materials, plant, equipment and ablution facilities (the location of which as agreed to by the developer and environmental consultants). In this document construction site office / camp / containers will be used interchangeably, but '*site office*' will be the preferred nomenclature. There will be one site office per sector. At these offices administrative duties will be performed. There will be construction camps at different locations at which fabrication activities will be performed.

Construction site: The working corridor (see below) and associated construction camp (see above), stockpile areas, pipe-yards, pipe fabrication yards and storage facilities, and site access roads. The working corridor includes a maximum area of 30m wide by 350m long, but may be less than this in certain sensitive areas. The construction site is to be demarcated and signposted by the Contractor. All construction activities are to remain within the confines of the working corridor, construction camp and pipe-yards. The terminology utilised in the contract documents is 'working front', 'Contractor's camp site' and 'working corridor'.

Disciplinary action: Financial penalties, time penalties, legal action, dismissal and/or any other action taken against the culprit responsible for an incident of non-compliance with the EMP. The disciplinary action will be determined according to the nature of the non-compliance or crime.

Timeous/ly: At least 7 working days prior to an activity, or after an instruction or request.

Registered servitude: For the purposes of this document, the (registered) servitude will refer to the area of the working corridor that will be registered as a permanent servitude for the operational phase of the project for the purposes of maintenance and pipe access. The servitude will be reinstated and rehabilitated, but both plant species choices and landuses will be limited along this corridor.

Working Corridor: This is the Temporary Working Space (refer below) as agreed to by the affected landowners together with the Registered (or operational) Servitude (refer above). The Working Corridor is the corridor within which work will take place (up to 30m wide) for the entire length of the pipeline. Part of the Working Corridor will constitute the Active sites or the Working Front (see below).

Working Front (see also Active Sites): The working front is the area of the working corridor where work is actively taking place such as clearing activities, excavations, trench activities, reinstatement activities and rehabilitation activities. More than one working front may be operative along the route. The working fronts are to be temporarily fenced, and all construction and rehabilitation related activities are to remain within the confines of the temporary boundary, and are to make use of access routes as determined for each active site. The working front length is split into 3 sections:

-Advance work front - the area which is cleared and grubbed and where proving for services takes place. This section length is limited to 250m to 300m.

-Construction work front - is the area where pipe laying activities take place and is limited to 200m (in built up areas) although it can be longer in agricultural areas (up to 500m) and shorter in restricted areas.

-Reinstatement work front – is the area usually no longer than 200m where reinstatement and rehabilitation takes place and lags behind the construction work front.

(Temporary) Working Space: For the purposes of this document, the temporary working space will refer to the area of working corridor that will be used for construction purposes but will not be registered as part of the permanent servitude during the operational phase of the project. For example, the working corridor may be 30m wide in some instances, and will comprise 12m of the permanent servitude, and 18m of the temporary working space. The working space is temporary, and permission to occupy this land is to be obtained from the relevant landowners prior to construction on their land. This servitude is to be reinstated and rehabilitated after construction.

c. About the Environment

Alter: In the context of this report means any action affecting the structure, appearance or physical properties of a place or object, whether by way of structural or other works, by painting, plastering or other decoration or any other means.

Archaeological: For the purpose of this document, 'Archaeological' refers to material 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; or features, structures and artefacts associated with military history which are older than 75 years and the sites on which they are found.

Cultural significance: For the purpose of this document, 'Cultural Significance' refers to the aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Ecofact: Non-artifactual organic or environmental remains that may reveal aspects of past human activity.

Environmental audit and monitoring: Structured observation, measurement and evaluation of environmental data over a period of time to assess the efficiency of environmental mitigation and rehabilitation measures. The auditing and monitoring of the site will commence at intervals to be determined by the DAEARD and Environmental Consultant, and will involve a site inspection of the construction activities and the environmental management compliance. A report of the findings at each visit will be compiled and submitted to the Developer and/or DAEARD as necessary.

Environmental Incident Report File (EIRF): A file provided at the Contractor's Site Office for the recording all environmental incidents and including a complaints register for the recording of general public concerns.

Environmental Management Plan (EMP): A detailed plan of action prepared to organise and coordinate environmental mitigation, rehabilitation and monitoring so that positive impacts are enhanced and negative impacts are avoided/minimised. The EMP is a legally binding document and is to be adhered to by 'all staff' (refer above) at all times.

Flagged Resource/s: A 'Flagged Resource' refers specifically to a resource or area identified along the pipeline route by specialists during the environmental investigations. These Flagged Resources require specific care and management.

Grave: A place of interment and includes the contents, headstone or other markers of and any other structures on or associated with such place. An unmarked grave will not have any headstone or markers identifying the deceased.

Heritage Resource: Any place or object of cultural significance (refer above) i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

Intangible (living) Heritage: The intangible aspects of inherited culture, and may include cultural tradition; oral history; performance; ritual; popular memory; skills and technique; indigenous knowledge systems; and the holistic approach to nature, society and social relationships.

Minimize: For the purposes of this document: to do all that is possible to lessen the impact.

Mitigation: For the purposes of this document: measures of environmental management designed to reduce, avoid or remedy undesirable environmental impacts.

Object: For the purpose of this document, 'Object' refers to any movable property of cultural significance (refer above) which may be protected in terms of any provisions of the NHRA or the KZNHA, including any archaeological artefact, palaeontological and rare geological specimens, and meteorites.

Paleontological: For the purpose of this document, "Palaeontological' refers to 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 and trace.

Structure: For the purpose of this document, 'Structure' refers to any building, works, device, or other facility made by people and which is fixed to land and any fixtures, fittings and equipment associated therewith older than 60 years.

iii. LIST OF SUPPORTING DOCUMENTATION

The information contained in this Environmental Management Plan (EMP) for the Northern Aqueduct Augmentation (NAA) Phase 4 Project, is derived from the Basic Environmental Assessment Report (BAR) as well as the specialist investigations that were commissioned during the Basic Assessment Process. The EMP reflects the standard and specific conditions of the Record of Decision, and includes four Annexure reports: A: Spoil Disposal Management Plan, B: Rescue and Rehabilitation Plan, C: Communications Plan and D: Heritage Management Plan. This report is derived from information in the following reports:

- Environmental Basic Environmental Assessment Report: Northern Aqueduct Augmentation Project; Phase 4 *Knight Piésold* 2013.
- A Basic Assessment of the Plant Communities Intersected by Phase 4 of the Northern Aqueduct Augmentation (Phase 4) and a Brief Account of their possible roles in determining Biodiversity.
- Frog Specialist Report for Wetland Areas adjacent to Eastbury Drive and possible impact of Phase 4 on the Northern Aqueduct Augmentation (NAA Ph4) Determining the presence of the critically endangered Pickersgill's Reed Frog, *Hyperolius pickersgilli.*
- Desktop Survey of the Proposed Northern Aqueduct Augmentation, Phase 4, KwaZulu-Natal.

- Northern Aqueduct Augmentation Phase 4: Report on the Public Participation for the Basic Assessment Study.

iv. FOREWORD

This Heritage Management Plan (HMP) forms part of the *Environmental Management Plan (EMP) for the Northern Aqueduct Augmentation Phase 4 Project* (Knight Piésold Consulting 2013). The communication and notification activities are therefore to be conducted in accordance with the EMP and any associated documentation, which reflect the conditions of authorization (such as the RoD).

The HMP will attempt to ensure that project progress and activities are communicated in a clear manner not only between all parties involved in the project but also to all authorities, stakeholders, IAPs and the general public. The HMP aims to limit the impacts of nuisances and disruptions associated with the project, conflict regarding lend legal issues, and the severity of accidents or emergencies during the construction and operation phases.

1. INTRODUCTION

Following environmental investigation which culminated in a Basic Environmental Assessment, a series of Environmental Management Plans (which include this Heritage Resource Management Plan (HMP)) for the Northern Aqueduct Augmentation (NAA) Phase 4 Project will be submitted in support of the application to the Department of Agriculture, Environmental Affairs and Rural Development (DAEARD). This HMP is considered part the Environmental Management Plan (EMP) for the NAA Project (Knight Piésold Consulting, 2013), and is therefore to be read in conjunction with the EMP and all of its annexure documents.

Heritage resources are considered extremely sensitive, and many are considered symbolic, spiritual and sacred by communities connected to the sites. Many heritage resources are formally protected and require permits or licences from the Heritage Regulating Authority (Amafa in KwaZulu-Natal) to be disturbed, damaged or destroyed. The NAA Phase 4 pipeline route mainly traverses existing electrical servitude and road reserve.

The HMP aims to facilitate the protection of known or discovered heritage or archaeological resources during the pre-construction and construction phases of the project by establishing a communications process and protocol for the project role players and standard procedures for dealing with such resources. The HMP further outlines the legislation and permitting requirements associated with the destruction or disturbance of such resources. Heritage resources include (but are not limited to):

- Archaeological objects
- Paleontological objects
- Ecofacts
- Objects related to battlefield sites
- Graves as listed in the relevant legislation
- Structures older than 60 years
- Material cultural artefacts
- Meteorites

1.1 Objectives

The objectives of this HMP are to provide standardised procedures and communication channels:

- To prevent the disturbance, destruction and/or removal of known or discovered heritage resources without the necessary permits or licences
- To control or inhibit any development activities taking place within 20 metres of a heritage resource or within 50 metres of a proclaimed Heritage Resources Site without the necessary permits or licences
- To prevent any structures older than sixty years from being demolished, damaged or altered without the necessary permits or licences

- To prevent any archaeological sites (sites older than a 100 years) from being demolished, damaged, altered or disturbed
- To prevent any destruction, alteration or exhumation from taking place at traditional burial places and graves of victims of conflict without following the necessary and regulated processes and protocols
- To control the destruction, alteration or disturbances of battlefield sites, archaeological sites, paleontological sites, historic fortifications, meteorite and meteorite impact sites without the necessary permits or licences.

1.2 Project Context

In June 2012, the *Knight Piésold* Environmental Division was appointed to undertake the necessary environmental investigations associated with the eThekwini Municipality Water and Sanitation (EWS) proposal to construct a ~5km bulk water pipeline to be known as Phase 4 of the Northern Aqueduct Augmentation (NAA) Project.

Because the construction of the WA (Phase 2) has been put on hold, an alternative link (NAA Phase 4 (or the Engineers Phase 3) is currently being proposed. This is to provide water from the EXISTING NAX into NAA Phase 1, so that Cornubia and other developments in the north of Durban, can be provided with water within the next 18 months, as the construction of the WA Ph2 will only reach the starting point of the NAA Ph2 (at Emachobeni) in five years time (optimistically).

It is thus proposed that a new 1.2m pipe be laid in parallel with the existing pipelines (to remove the bottleneck in the system) **between Duffs Road and Phoenix 2 Reservoir**. This pipeline forms Phase 4 of the NAA and is required to be commissioned at the same time as NAA Ph 1, i.e. 2014.

The existing two pipes within the servitude will continue to be used (current daily volume approximately 50,000m^3). The new bigger pipe will merely augment the existing pipelines which are presently a bottleneck in the system. The old pipes are much smaller (450 – 500mm) in diameter, and as such when the new pipe is tied into the system, the water will prefer the path of least resistance, and thus most of it, will 'choose' the bigger pipe. The ultimate 30-year demand in the system will result in a total flow of about 120,000 m^3 per day, of which 100,000 m^3 per day will flow in the new (bigger) pipe as a result of its lower friction loss.

The project was registered with the Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) as EIA No: DM/0065/2012 as per the requirements of the governing environmental legislation at the time: Regulations pursuant to the National Environmental Management Act of 1998 (as amended in July 2010).

The Environmental Basic Assessment Report for the NAA Phase 4 Project was prepared by *Knight Piésold* and will be submitted to the DAEARD in April .

The final EMP will reflect the specific and standard conditions of the Record of Decision (RoD) once obtained from the DAEARD when authorising this project. The EMP defines the specific site care, management, mitigation and rehabilitation methods required along the route.

1.3 Project Detail

Table 1.1 Contact Details for Northern Aqueduct Augmentation Project

PROJECT: EIA No.: DM/0065/2012	Northern Aqueduct Augmentation Phase 4
APPLICANTS	EThekwini Water & Sanitation
CONTACT PERSON (APPLICANT)	Monte Montemerano Tel: 031 311 8742, Fax: 031 311 8545 MontyMo@dmws.durban.gov.za
NATURE OF THE DEVELOPMENT	Steel gravity-fed potable water pipeline project
PIPELINE LENGTH	5 linear kilometres
JURISDICTION	EThekwini Municipality
CURRENT LAND USES	Predominantly road reserve, existing electrical servitude servitude, open space
LISTED ACTIVITY IN TERMS OF THE NEMA (No. 107 of 1998, revised June 2010)	Regulation No. R 544 (Listing Notice 1, Activities 9, 11, 18 & 37) Regulation No R 545 (Listing Notice 2, Activity 10)
HERITAGE SPECIALIST/S	Umlando Contact: Gavin Anderson Tel: 035 7531785), Fax: 086 5445631
INDEPENDENT ENVIRONMENTAL CONSULTANTS	Knight Piésold (Pty) Ltd. Contact: Deepa Seepersad Tel: 031 276 4660, Fax: 031 262 2950 dseepersad@knightpiesold.com PO Box 383, Westville 3630

1.4 HMP in its Legal Context

The HMP is a legally binding document in the context that it is considered an extension of the EMP. The RoD will provide the legal platform for the EMP, and stipulate as part of the specific conditions of authorisation that an EMP is necessary. Although the RoD may not make specific mention of the need for a full HMP, this document has been prepared as an EMP annexure in the interest of best environmental practice. The heritage resources identified by the Heritage Specialist are of relevance to the project proposal and have been made known to the Consulting Engineers, Amafa and the DAEARD. The design and routing of the pipeline has attempted to accommodate these resources, and where significant route changes

are anticipated, these have been included in an application for an amendment to the RoD. This HMP has been developed for the preservation of known heritage resources as well as for new discoveries during construction. The required permit procedures for the demolition or disturbances to known heritage resources are also addressed.

Although this HMP has been prepared in accordance with the Integrated Environmental Management Process as required by the Regulations pursuant to the National Environmental Management Act (No. 107 of 1998), heritage resources and their management are currently protected and regulated by other South African legislation. In KZN, the most relevant legislation is the KwaZulu-Natal Heritage Act (No. 4 of 2008) (KZNHA) which came into effect on the 12 February 2009. Prior to this, heritage resources in KZN were protected by the former KwaZulu-Natal Heritage Act (No.10 of 1997) which set the precedent for heritage resource protection in South Africa as it formed the basis for the formulation of the National Heritage Resources Act (No. 25 of 1999) (NHRA) and the National Heritage Council Act (No. 11 of 1999) (NHCA).

In summary, the KZNHA applies to heritage matters in the KZN province including both physical and intangible (living) heritage (refer glossary), and where the KZNHA does not regulate a matter pertaining to a KZN heritage resource, this will then fall under the provisions of the NHRA or the NHCA.

In terms of Chapter 8 of the KZNHA, the following heritage resources are afforded general protection as described below:
Structures: "33(1a). No structure which is, or may be reasonably expected to be older than 60 years may be demolished, altered or added to without prior written approval of the Council having been obtained on written application to the Council"
Graves of victims of conflict: "34. No person may damage, alter, exhume or remove from its original position (a) the grave of a victim of conflict (b) a cemetery made up of such graves (c) any part of a cemetery made up of such graves without prior written approval of the Council having been obtained on written application to the Council"
Traditional burial places: "35(1a). No grave not otherwise protected by this Act, and (1b) graves not located in a formal cemetery…may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council"
Battlefield sites, archaeological sites, rock art sites, paleontological sites, historic fortifications, meteorite or meteorite impact sites: *"36(1). No person may destroy, damage, excavate, alter, write or draw upon, or otherwise disturb* (any of the above)*…without prior written approval from the Council on written application to the Council".*

2. ROLES AND RESPONSIBILITIES

The Developer, Consulting Engineers, Contractor, Environmental Consultants, Environmental Control Officer and Heritage Specialist shall comply with the Environmental Management Plan for the Northern Aqueduct Augmentation Project, KZN, and as this HMP forms part of the EMP they shall also comply with the specifications of this report. The Contractor and Heritage Specialist are also responsible for ensuring that all sub-contractors, sub-specialists, suppliers and staff appointed also adhere to the conditions of the EMP and HMP.

2.1 Developer

For the purposes of this document, 'Developer' refers to the client eThekwini Municipality Water & Sanitation, who must ensure that the Conditions of the RoD are adhered to at all times, through oversight of the Consulting Engineers, who will oversee the Contractors. Given this role, the Developer must ensure that the known heritage resources are preserved in accordance with the relevant requirements, or if this is not possible that the necessary approvals are obtained for the disturbance or demolition of heritage resources and that this is executed in accordance with the HMP.

2.2 Consulting Engineers

For the purposes of this document, the term 'Consulting Engineers' refers to the engineers for Northern Aqueduct Augmentation appointed by EWS, who will provide consulting engineering services including advice and engineering guidance on site in order to ensure adherence to all design and engineering specifications. Given this role, the Consulting Engineers must ensure that the design and routing of the pipeline accommodate the preservation of known heritage resources wherever possible; and that the Contractor preserves these items in accordance with the HMP. The Consulting Engineers must ensure that any planned disturbances or demolitions of known heritage resources that cannot be accommodated by design are made known to the Environmental Consultants such that these can be communicated to the Heritage Specialist and the necessary permit procedures and authorisations can be undertaken prior to construction. The Consulting Engineers (through the Engineer's Representative) are also responsible for ensuring that any heritage resource discoveries made by the Contractor during construction are cordoned off and afforded the required investigations by the Environmental Consultants and Heritage Specialist as described by this HMP.

2.3 Contractor

For the purposes of this document, the term 'Contractor' refers to the main contractor(s) appointed to undertake the construction of the project, or portion of the construction of the project. Given this role, the Contractor must ensure that known heritage resources are preserved *in situ* in the manner described by this HMP as required by the relevant legislation, and that all construction staff are aware of the preservation requirements. The Contractor must ensure that all construction activities honour the buffer requirements for known heritage resources as defined by this report. The Contractor must also ensure that the Environmental Site Officer (ESO) communicates the discovery of new heritage resources to the Engineer's Representative (ER) immediately, and that all staff are made aware of the procedures necessary to cordon off and avoid the new discoveries until such time as the Environmental Consultants and the Heritage Specialist have determined a way forward.

2.4 Environmental Consultants

For the purposes of this document, the term 'Environmental Consultants' refers to Knight Piésold Consulting, who are the company responsible for the development of the EMP including the HMP. Given this role, the Environmental Consultants must ensure that the known heritage resources as determined by Heritage Specialist during the environmental investigations are communicated to the Consulting Engineers such that these items can be accommodated in the design

and routing of the pipeline. The Environmental Consultants must ensure that the mitigation and management options for the preservation of known heritage resources as determined by the Heritage Specialist are reflected in this HMP, and that the procedures for new discoveries are clearly communicated in the HMP to the project team. The Environmental Consultants must also ensure that the relevant authorities are informed of the presence of and impacts to known heritage resources within the construction footprint. In the event of new discoveries of heritage resources during construction, the Environmental Consultants must ensure that the Heritage Specialist and relevant authorities are consulted and the necessary investigations are undertaken to determine a way forward, and that this is communicated to the Consulting Engineers and ultimately the Contractor.

2.5 Environmental Control Officer

The ECO provides input and environmental guidance on site in order to ensure adherence to the EMP and general project environmental sustainability, and will monitor and audit construction activities in relation to their compliance with the EMP and its supporting documents. Given this role the ECO will monitor the preservation of known heritage resources, and will document the procedures and outcomes surrounding new discoveries in the audit process. The ECO must communicate the discovery of new heritage items to the Environmental Consultants such that the Heritage Specialist can be consulted and a way forward determined.

2.6 Heritage Specialist

The Heritage Specialist (as identified by the Environmental Consultants) is to be appointed by the Developer to ensure that all known heritage resources are clearly communicated to the Environmental Consultants such that the Consulting Engineers can accommodate these in the design and routing of the pipeline. The Heritage Specialist must determine the preservation processes for known heritage resources within or in the vicinity of the working corridor, and must determine the appropriate procedures and way forward for new heritage resource discoveries during construction. In the event of new discoveries, the Heritage Specialist is to advise the Environmental Consultants on the need for further specialist appointments, investigations or permit procedures. The Heritage Specialist is to ensure that the requirements of the Heritage Regulating Authority (Amafa) are understood and met by the project team that the necessary permits are in place, and that suitable mitigation or management options are clearly communicated in the HMP.

2.7 Department of Agriculture, Environmental Affairs and Rural Development

The DAEARD are the Environmental authority in KZN who will ensure compliance with the EMP and general environmental sustainability. Given this role, the DAEARD must audit the environmental monitoring process and reports prepared by the ECO, including documentation pertaining to the preservation of known heritage resources or the discovery of new heritage resources. The DAEARD are to implement disciplinary action on the Developer if non-compliance with the HMP is deemed severe enough.

2.8 Amafa

Amafa are the Heritage Regulating Authority in KZN who will ensure the preservation of known heritage resources, or that the demolition or disturbance of known heritage resources are undertaken with the necessary authorisations. Given this role, Amafa must determine the processes or requirements associated with both known and discovered heritage resources and communicate these to the Heritage Specialist and Environmental Consultants.

2.9 Community Liaison Officers

Community Liaison Officers (CLOs) from the eThekwini Municipality may need to assist in delicate community issues relating to heritage resources, and should advise and participate during any public consultation processes to ensure all authorities, local leaders/representatives, and/or descendents are involved.

3. GENERAL CATEGORIES FOR HERITAGE RESOURCE MANAGEMENT

A heritage resource is not limited to archaeological artefacts, historical buildings and graves, but is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals. In the NHRA, a heritage resource is defined as '*any place or object of cultural significance i.e. of aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance*'. The word '*place*' in this instance refers to a site, area or region, a/group of building/s or structure/s, and an open space or immediate surroundings of a place. Heritage resources may also be paleontological such as fossilized remains or fossil traces of animals, organisms or plants which lived in the geological past, or any site containing such remains. For management purposes, heritage resources have been divided into two categories in this report:

- Those that are known and can therefore be incorporated into the design and routing of the pipeline, or alternatively protected during construction or demolished/disturbed on receipt of written authorization following written application to Amafa.
- Those that are unknown and may be discovered during the construction phase of the project, and will therefore require further investigation or processes before construction may continue.

3.1 New Discoveries

The KZN area has a rich heritage and many unknown heritage resources may be exposed during the construction activities. Although exact processes cannot be determined without knowing what may be discovered, Section 4 of this report presents a protocol for possible discoveries such that these may be best preserved until further specialist findings are made. Heritage resources relating to the following historical periods may well be discovered:

Table 3.1 Potential Resources found in various Ages

Age	Potential Resources	
Early Stone Age	1.5 million to 180 000 years ago: Only stone artefacts remain from this time period, including large choppers, cleavers and hand axes.	
Middle Stone Age	180 000 to 35 000 years ago: Stone tools smaller than in ESA; include blades and flakes; human and animal remains also found.	
Late Stone Age	35 000 years ago to the time of European settlement: Variety of artefacts made from organic and inorganic materials; human remains, shell middens, stone artefacts, pottery, scrapers, beads and shaved bone are some resources found.	
Early Iron Age	400– 500 AD: Mzonjani phase heritage resources	Metal objects, pottery, agricultural artefacts, ceramic sherds, upper and lower grindstone, furnace remains.
	500 – 700 AD: Msuluzi phase heritage resources	
	700 – 900 AD: Ndondondwane phase heritage resources	
	900 – 1200 AD: Ntshekane phase heritage resources	
Late Iron Age	1200 – 1500 AD: Heritage resources from the Nguni speakers	
	1500 – 1700 AD: Heritage resources associated with maize introduction.	
	1700 – 1850 AD: Heritage resources associated with pre-European settlement.	
	1850 AD to present; Heritage resources associated with post-European settlement and cultural merges.	

3.2 Known Heritage Resources

A heritage specialist was appointed to undertake the cultural heritage and palaeontological study for the proposed NAA Phase 4 project to determine the exact impact to heritage resources during construction. The route was considered feasible from the heritage expert's perspective. A desktop study undertaken by the heritage specialist revealed that there is no known, or previously recorded, heritage sites in the study area. The 1937 aerial photographs indicate that most of the route was already under sugar cane. Plantation houses are clearly visible, and no labourer's houses occur within the study area. Thus, the area should be free of post 1930s graves.

The only portion that could have Stone Age, Late Iron Age, and/or Historical Period occupation is the hill on the Erf Moriah 16743FU. This is a small area of land that has had some form of agriculture for at least 80 years, and any archaeological site would have been completely damaged. The survey for the NAA line occurred on the same hill system, but 450m to the east. The geology on that hill is the same as this hill, and it is not conducive to human occupation, due to the shallow soils and shale substrate.

The shale substrate was shown to be palaeontologically sensitive in the NAA desktop study. The sensitive area was Orange flagged: it is ~350m east of the undeveloped hill on Moriah 16743FU. In the NAA Phase 4 desktop study it was "recommended that outcrops of the Vryheid Formation, where present, be recorded for closer inspection by a trained palaeontologist. Where deep excavation into Vryheid Formation shale is expected, it is recommended that a trained

palaeontologist visit the sites of excavation and, if ichnofossils are present; obtain a permit from SAHRA and/or AMAFA for collection of a representative sample for study purposes" (PIA in Anderson 2011).

Thus, it is therefore necessary that this section of the line undergo careful monitoring during the construction phase of the NAA Phase 4 project. The palaeontological sensitive area occurs from S29°44'11.23" E31° 1'18.27"E to S29°43'57.83" E31° 1'16.90".

Figure 1: Encircled area: Palaeontologically sensitive portion of the route.

4. PROTECTION OF KNOWN HERITAGE RESOURCES

4.1 Palaeontogical Items

Table 4.1 Palaeontological Items (Late Iron Age Items)

PROTECTION	Late Iron Age and recent historically-relevant settlement resources located along the proposed route are protected as they are considered as *structures* older than 60 years, and/or as archaeological sites. These resources may not be altered, disturbed or destroyed in terms of 33 (1a) and/or 36 (1) of the KZNHA without authorisation from Amafa (a permit process may be necessary). Known resources include but are not limited to pottery, fossils, stone walling, settlement areas and gravesites.
PRESERVATION THROUGH DESIGN	The Heritage Specialist is to make these remnants or items and their locations known to the Consulting Engineers, and the detailed design of the pipeline in the vicinity of these structures needs to carefully consider preserving their integrity with a no-go buffer zone. The Heritage Specialist (in consultation with the Consulting Engineers) is also to notify Amafa and local municipal authorities in writing of the proposed proximity of works to the known settlement resources and is to confirm that the proposed buffer and mitigation measures are deemed appropriate. Routing determination and pipeline design also need to take into account the required reduced working corridor width and restrictions on certain construction activities within the working corridor at these sites.
PRESERVATION DURING CONSTRUCTION	The items/remnants are to be located prior to construction and demarcated appropriately with suitable buffers in consultation with a Heritage Specialist, as approved by Amafa. The Contractor is required to reduce the working corridor width to its minimum when working within 20 metres of the known settlement resources. Known remnants are to be barricaded (refer glossary) and general access to these remnants is to be prohibited. The Heritage Specialist should be present during site clearing in the vicinity of these remnants and construction staff on the alert at all times for possible new discoveries. Any planned disturbances or demolitions of the settlement resources will require written authorization from Amafa. In the event of unplanned disturbances or the discovery of new resources, works on site are to cease immediately and the ECO is to be contacted. The ECO is to contact the Heritage Specialist, DAEARD and Amafa if necessary to determine a way forward. The unplanned disturbances or new discoveries are to be recorded in the EIRF and the outcomes reflected in the monthly audit reports by the ECO. A Palaeontologist must inspect the sites during construction. If ichnofossils are present; a permit from SAHRA and/or AMAFA needs to be obtained for the collection of a representative sample for study purposes. The heritage assessment also points out the small area of land, Erf Moriah 16743FU, has had some form of agriculture for at least 80 years, and any archaeological site would have been completely damaged. Careful monitoring however, will still need to be undertaken.
UNAVOIDABLE DISTURBANCE OR DEMOLITION	If the known settlement resources cannot be avoided during construction and a decision has been taken to excavate through these sensitive sites, then: The Heritage Specialist is to be consulted and is to assess the site and design proposal, and determine the extent of impact A Permit Application is to be submitted by the Heritage Specialist to Amafa to request permission to disturb/damage/destroy known settlement resources located in close vicinity (20m) of the proposed route. The DAEARD are to be informed of the outcome. The project will be partially affecting sites of Palaeontological, Archaeological and cultural heritage value, and it is a legal requirement to obtain a permit for the (partial) damage to a site, regardless of the magnitude of the impact, or the significance of the site. A

	partial destruction permit for the partial destruction of archaeological and palaeontological sites from Amafa KZN, has been obtained. If the permit is approved, the ECO and Heritage Specialist are to be on site to monitor the demolition/disturbance activities and ensure that the conditions of the permit are met.

4.2 Railway Heritage Resources

'Railway heritage resources' in relation to the NAA Phase 4 Project refers to structures that form part of the railway history of South Africa that are in the vicinity or close proximity of the pipeline impact footprint. Railway heritage resources can be combined to create a railway cultural landscape that could be protected as a Heritage Landmark Site. Heritage items and resources that could be discovered during construction or encountered during a possible change of route are existing railway servitude and railways lines, currently obscured by vegetation and the like. The majority of the project route follows existing electrical servitude and no railway heritage resources were identified during the specialist assessments.

Table 4.2 Activities Crossing the Railway Servitude

PROTECTION	Railway lines and objects at these crossing points are *structures* older than 60 years. They may not be altered, disturbed or destroyed in terms of 33 (1a) of the KZNHA without authorisation from Amafa (a permit process may be necessary).
PRESERVATION THROUGH DESIGN	Should the pipeline route impact upon a railway line, the Railway Regulator is to be notified by the Consulting Engineers of the project and permission obtained for all works in the railway servitude prior to construction. These crossings are considered sensitive sites and require that the Consulting Engineers accommodate any physical railway structures or objects in the routing and access requirements of the project. Design of the pipe placement also needs to take into account the required reduced working corridor width for Flagged Resources and restrictions on certain construction activities within the working corridor at these sites.
PRESERVATION DURING CONSTRUCTION	The Contractor is required to reduce the working corridor width to its minimum when working at the railway servitude crossing points. Fences are to be erected and access to these sites are to be restricted to approved access routes as determined by the Consulting Engineers in consultation with the Heritage Specialist. No stockpiling or materials storage are permitted within the railway servitude at these crossing points, and heavy machinery is to be restricted where possible. Any planned disturbances to the line or railway structures will require written authorization from Amafa. In the event of unplanned disturbance, works on site are to cease immediately and the ECO is to be contacted. The ECO is to contact the Heritage Specialist, DAEARD and Amafa if necessary to determine a way forward.

Table 4.3 Activities Following the Railway Servitude

PROTECTION	The railway line and objects within the railway servitude are *structures* older than 60 years. They may not be altered, disturbed or destroyed in terms of 33(1a) of the KZNHA without authorisation from Amafa (a permit process may be necessary).
PRESERVATION THROUGH DESIGN	Should the pipeline route impact upon a railway line, the Railway Regulator is to be notified by the Consulting Engineers of the project and permission obtained for all works in the railway servitude prior to construction. These crossings require the Consulting Engineers to accommodate any physical railway structures or objects in the routing and access requirements of the project. Design of the pipe placement also needs to take into account the required reduced working corridor width for Flagged Resources and restrictions on certain construction activities within the working corridor at these sites
PRESERVATION DURING CONSTRUCTION	The items are to be located prior to construction and demarcated appropriately with suitable buffers in consultation with a Heritage Specialist. Construction scheduling in the railway servitude should be determined in consultation with the Railway Regulator. The Contractor is required to reduce the working corridor width to its minimum when working in the railway servitude. Structures are to be barricaded (refer Glossary) and general access to these sites prohibited. Access to the working corridor is to be restricted to approved routes as determined by the Consulting Engineers in consultation with the Heritage Specialist. No stockpiling or materials storage is permitted within the railway servitude, and heavy machinery is to be restricted where possible. Any planned disturbances to the line or railway structures will require written authorization from Amafa. In the event of unplanned disturbance, works on site are to cease immediately and the ECO is to be contacted. The ECO is to contact the Heritage Specialist, DAEARD and Amafa if necessary for a way forward.
UNAVOIDABLE DISTURBANCE OR DEMOLITION	If the railway heritage resources cannot be avoided during construction and a decision has been taken to excavate through these sensitive sites, then: The Heritage Specialist is to be consulted and is to assess the site and design proposal, and determine the extent of impact. A Permit Application is to be submitted by the Heritage Specialist to Amafa to request permission to disturb/damage/destroy known railway resources located in the close vicinity (20m) of the proposed route. Part of this permit process may include detailed public consultation. The DAEARD are to be informed of the outcome. If approved, the ECO and Heritage Specialist are to be on site to monitor the demolition/disturbance activities and ensure that the conditions of the Permit are met.

5. PROTECTION OF OTHER POSSIBLE HERITAGE RESOURCES

5.1 Stone Walling Resources

'Stone walling resources' in relation to the NAA Phase 4 Project refers to stone wall features (that form part of the settlement history of South Africa) that are in the vicinity or close proximity of the pipeline impact footprint. No stone walls were identified during the HIA investigation however; stone wall discoveries could be made during construction or encountered during a route change where settlements have occurred in the past.

Stone walling structures have been utilized for the last two thousand years in human settlement patterns, and typically are stone-packed walls that demarcate fence lines/ boundaries. Stone walling was a method of preventing the enemy

from entering the homestead/ settlement area. Some stone walling resources are remnants of buildings or houses and demarcate the original foundations or floor plans. Stone circles may be an indication of the occurrence of homesteads, fireplaces and hut floors and these are typically found at Iron Age sites. Stone walling can be identified on aerial photographs and can provide an indication of the size of the settlement and if other settlements are located in the same geographic area.

Table 5.1 Activities affecting the Stonewalling Resources

PROTECTION	Stone walls are considered as *structures* older than 60 years. These resources may not be altered, disturbed or destroyed in terms of 33 (1a) of the KZNHA without authorisation from Amafa (a permit process may be necessary).
PRESERVATION THROUGH DESIGN	The Heritage Specialist is to make the location and distance of the stone wall remnants known to the Consulting Engineers, and the detailed design of the pipeline in the vicinity of these structures needs to carefully consider preserving their integrity with a no-go buffer zone. The Heritage Specialist (in consultation with the Consulting Engineers) is also to notify Amafa and local municipal authorities in writing of the proposed proximity of works to the stone walling and is to confirm that the proposed buffer and mitigation measures are deemed appropriate. Routing determination and pipeline design also need to take into account the reduced working corridor width for Flagged Resources and restrictions on certain construction activities within the working corridor at these sites.
PRESERVATION DURING CONSTRUCTION	The items/remnants are to be located prior to construction and demarcated appropriately with suitable buffers in consultation with a Heritage Specialist, as approved by Amafa. The Contractor is required to reduce the working corridor width to its minimum when working within 20 metres of the stone walling. Barricades (refer glossary) are to be erected to protect the stone walling and to prohibit general access to these structures. The Heritage Specialist should be present during site clearing in the vicinity of these remnants and construction staff on the alert at all times for possible new discoveries. Any planned disturbances or demolitions of the stone walling is strongly dissuaded but will require written authorization from Amafa if required. In the event of unplanned disturbances or the discovery of new resources, works on site are to cease immediately and the ECO is to be contacted. The ECO is to contact the Heritage Specialist, DAEARD and Amafa if necessary to determine a way forward. The unplanned disturbances or new discoveries are to be recorded in the EIRF and the outcomes reflected in the monthly audit reports by the ECO.
UNAVOIDABLE DISTURBANCE OR DEMOLITION	It is strongly recommended that the stone walls are preserved in situ, however if remnants associated with these structures cannot be avoided during construction and a decision has been taken to excavate through these sensitive sites, then: The Heritage Specialist is to be consulted and is to assess the site and design proposal, and determine the extent of impact A Permit Application is to be submitted by the Heritage Specialist to Amafa to request permission to disturb/ damage/ destroy known stone walling resources located in close vicinity (20m) of the proposed route. Part of this permit process may include detailed public consultation. The DAEARD are to be informed of the outcome. If approved, the ECO and Heritage Specialist are to be on site to monitor the demolition/disturbance activities and ensure that the conditions of the Permit are met.

5.2 Grave Sites

'Known grave site resources' in relation to the NAA Phase 4 refers to unmarked grave sites that may or may not form part of the Late Iron Age settlements and/or more recent settlement patterns (older than 60 years) that are of relevance to the history of Durban/KZN. Unmarked grave sites are dealt with separately here given the more detailed procedures required in terms of their protection, mitigation measures, community and authority consultation procedures, and exhumation procedures. A variety of legislation deals with all types of graves and it is therefore important that known grave sites affected by the construction corridor are dealt with in accordance with this legislation, and that the procedures for new discoveries are properly followed.

The NHRA defines a "grave" as *"a place of interment and includes the contents, headstone or other markers of and any other structures on or associated with such place".* The General Principles of the NHRA (Chapter I, Part I) provides for the protection of heritage resources of the National Estate which may not be disturbed, altered or destroyed without written authorisation on written application to the heritage resource authority. The National Estate may include graves and burial grounds (3g of the NHRA), including –

- ancestral graves,
- royal graves and graves of traditional leaders,
- graves of victims of conflict,
- graves of important individuals,
- historical graves and cemeteries older than 60 years, and
- other human remains which are not covered under the Human Tissues Act, 1983 (Act No.65 of 1983 as amended).

Chapter II, Part II of the NHRA describes the general protection and management of heritage resources, and 36 (3) states that *"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 or 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 (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of materials."* Graves are further protected by the Provincial legislation, where the KZNHA provides for the General Protection of Heritage Resources in Chapter 8, and graves are covered by two listings:

- **Graves of victims of conflict:** *"34. No person may damage, alter, exhume or remove from its original position (a) the grave of a victim of conflict (b) a cemetery made up of such graves (c) any part of a cemetery made up of such graves without prior written approval of the Council having been obtained on written application to the Council"*

- **Traditional burial places:** *"35(1a). No grave not otherwise protected by this Act, and (1b) graves not located in a formal cemetery…may be damaged, altered, exhumed, removed from its original position, or otherwise disturbed without the prior written approval of the Council having been obtained on written application to the Council"*

Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (No.65 of 1983) and the KwaZulu-Natal Cemeteries and Crematoria Act (No. 12 of 1996) which provides for the exhumation, re-internment or disposal or cremation of human remains. Exhumation of graves requires a permit from Amafa and must also conform to the standards set out in the Ordinance on Excavations (Ordinance No. 12 of 1980). The permit applications require that permission is gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and local police. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place.

- Based on the above protection, unmarked graves in the vicinity of the construction corridor must be preserved and protected, and only if this is not in any way possible should exhumation be considered. The processes and permit requirements associated with proposed damage, alteration, exhumation or removal/relocation are lengthy and tedious, and should only be considered as a last resort.

Table 5.2 Protection of Unmarked Graves that may be uncovered during Construction

PROTECTION	Unmarked grave sites that may or may not be related to the Late Iron Age Settlement resources or the recent historically-relevant settlement resources located in this same valley are protected in terms of the NHRA and the KZNHA. These resources may not be damaged, altered, exhumed or removed from their original position without authorisation from Amafa. A permit process is necessary should such disturbances be proposed (see Table 5.5 below).
PRESERVATION THROUGH DESIGN	The Heritage Specialist is to make the grave locations known to the Consulting Engineers, and the detailed design of the pipeline in the vicinity of these graves must preserve their integrity with a no-go buffer zone of 20 metres around each grave site. The Heritage Specialist must notify Amafa in writing of the unmarked grave resources. The Heritage Specialist (in consultation with the Consulting Engineers) must also notify Amafa and local municipal authorities in writing of the proposed proximity of works to the unmarked graves and must confirm that the proposed buffers and mitigation measures are deemed appropriate. Routing determination and pipeline design also need to take into account the required reduced working corridor width for Flagged Resources and restrictions on certain construction activities within the working corridor at these sites.
PRESERVATION DURING CONSTRUCTION	The unmarked graves are to be located prior to construction and demarcated appropriately with suitable buffers around each site. Given the nature of the terrain, the complexities associated with the biodiversity concerns of the site, and the number of scattered heritage resources in the vicinity of the construction corridor, it is not possible to determine a fixed buffer width per grave as this will not allow for sufficient working area within the developable portion of the site. Rather, realistic buffers should be determined on site in consultation with a Heritage Specialist, and approval by Amafa can be sought at this time. The Contractor is required to reduce the working corridor width to its minimum when working within 30 metres of the known grave resources. Known graves are to be barricaded (refer glossary) and general access to these sites is to be prohibited. The Heritage Specialist should be present during site clearing in the vicinity of these graves and construction staff on the alert at all times for possible new discoveries. Any planned disturbances or demolitions of the grave resources will require written authorization from Amafa. In the event of

	unplanned disturbances or the discovery of new resources, works on site are to cease immediately and the ECO is to be contacted. The ECO is to contact the Heritage Specialist, DAEARD and Amafa if necessary to determine a way forward. The unplanned disturbances or new discoveries are to be recorded in the EIRF and the outcomes reflected in the monthly audit reports by the ECO.

Table 5.3 Disturbances to Exhumation of Unmarked Graves

LEGAL REQUIREMENTS	If the unmarked grave resources cannot be avoided during construction and a decision has been taken to excavate through these sensitive sites, then written authorisation is necessary from the heritage authority in terms of the NHRA and the KZNHA. Human remains that are less than 60 years old are subject to provisions of the Human Tissue Act (No.65 of 1983) and the KwaZulu-Natal Cemeteries and Crematoria Act (No. 12 of 1996) which provides for the exhumation, re-internment or disposal or cremation of human remains. Exhumation of graves requires a permit from Amafa and must also conform to the standards set out in the Ordinance on Excavations (Ordinance No. 12 of 1980). The processes and permit requirements associated with proposed damage, alteration, exhumation or removal/relocation are lengthy and tedious, and should only be considered as a last resort.
REPORTING	The Consulting Engineers are to notify the Environmental Consultants, who in turn are to notify the Heritage Specialist of the inability to avoid unmarked grave sites through the pipeline routing or design. The Heritage Specialist is to determine the extent of impact to the affected unmarked graves as a result of the proposed construction activities, and is to notify the Environmental Consultants of the findings. Amafa, the DAEARD, the local authority and the land owner/s are to be notified in writing of the location of the graves in relation to the working corridor and the anticipated extent of impact on each site.
DETERMINE PERMIT REQUIREMENTS	Should the identity of the remains or the age of a grave be unknown, then in terms of the NHRA, Amafa in cooperation with the South African Police Service is to carry out investigations for the purpose of obtaining information on whether or not such a grave is protected in terms of the NHRA, or is of significance to any community. A Grave Specialist may need to be appointed in this regard, and the Community Liaison Officer (CLO) approached to assist in community consultation. Should Amafa determine that a permit procedure is necessary, they are to communicate this and their requirements in writing to the Environmental Consultants, who are to notify the Consulting Engineers and the Developer. The Heritage Specialist is responsible for facilitating the processes associated with the Permit Application; these processes may include lengthy public and authority consultation. Only on receipt of a permit may any exhumation or disturbance to the grave occur. Should Amafa for any reason determine that a permit procedure is not necessary, they are to communicate this in writing to the Environmental Consultants, who are to notify the local municipal authority and await further instruction on the exhumation requirements.
EXHUMATION OR DISTURBANCES	The permit applications require that permission is gained from the descendants (where known), the National Department of Health, Provincial Department of Health, Premier of the Province and the South African Police Service. Furthermore, permission must also be gained from the various landowners (i.e. where the graves are located and where they are to be relocated) before exhumation can take place. In some instances compensation may be necessary for the descendents of the deceased. Exhumation processes are to be conducted in accordance with KwaZulu-Natal Cemeteries and Crematoria Act (No. 12 of 1996) and must also conform to the standards set out in the Ordinance on Excavations (Ordinance No. 12 of 1980). The Heritage Specialist is to oversee the exhumation processes on site and ensure the conditions of any permits or authorisations are met by the Developer.

5.3 Communication Ethics

The NHRA states that "Graves, burial sites, war memorials and monuments are tangible and symbolic reminders of our turbulent history. Graves are architectural examples of the space where we transcend the historical past" and that "Graves and monuments are tangible and symbolic reminders of individual, family and community histories of bereavement. This history is as much concerned with the record of individual loss, as with collective representation of suffering, or ideas of patriotic sacrifice or national aspirations".

Given the histories of bereavement, the ancestral connections and sensitivities of many cultures, and the sacred reminders of the deceased symbolised by the grave and its location, it is very important to treat any community consultation regarding an unmarked grave with respect and sensitivity. It is important that the community structures are understood and that the consultation process respects the traditional leadership and cultural preferences of the community. Language barriers and cultural differences between the project team and the community should be acknowledged as limitations in the approach, and appropriate plans put in place to reduce these problems. The following is recommended:

- A meeting with the local Traditional Leaders will have to be arranged in order to discuss the spiritual and sacred beliefs surrounding gravesites that are located in the affected area, to understand the correct protocol for community consultation, and to determine the identities of the descendents of the deceased.
- The Community Liaison Officer (CLO) is to assist in identifying the Ward Councillors or political leaders in the area to determine their approach to community consultation and to better understand the political arena of the community in question
- Once a consultation plan is determined, the CLO is to assist in implementing the plan. An accommodating personality is required from the CLO to create a feeling of patience and understanding when communicating with the local community members
- It is important that the local community or the descendents of the deceased fully understand the need for exhumation or disturbance to the graves, the plan in terms of relocation, and the location of where the remains will be reburied/relocated.

5.4 Cultural Heritage

Table 5.4 Cultural Heritage (Worship Areas)

PROTECTION	The National Heritage Resources Act of 1999 (pp 12-14) protects a variety of heritage resources. These resources are defined as follows: 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. 3. Without limiting the generality of subsections (1) and (2), a place or object is to be considered part of the national estate if it has cultural significance or other special value because of— *(g)* its strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.
PRESERVATION THROUGH DESIGN	The Heritage Specialist is to make these cultural heritage sites and their locations known to the Consulting Engineers, and the detailed design of the pipeline in the vicinity of these structures needs to carefully consider preserving their integrity with a no-go buffer zone. The Heritage Specialist (in consultation with the Consulting Engineers) is also to notify Amafa and local municipal authorities in writing of the proposed proximity of works to the known cultural heritage sites and is to confirm that the proposed buffer and mitigation measures are deemed appropriate. Routing determination and pipeline design also need to take into account the required reduced working corridor width for Flagged Resources and restrictions on certain construction activities within the working corridor at these sites.
PRESERVATION DURING CONSTRUCTION	The cultural heritage sites are to be located prior to construction and demarcated appropriately with suitable buffers in consultation with a Heritage Specialist. The Contractor is required to reduce the working corridor width to its minimum when working within 20 metres of the known settlement resources. Known locations of cultural heritage sites are to be barricaded (refer glossary) and general access to these sites are to be prohibited. The Heritage Specialist should be present during site clearing in the vicinity of cultural heritage sites. The unplanned disturbances are to be recorded in the EIRF and the outcomes reflected in the monthly audit reports by the ECO.
UNAVOIDABLE DISTURBANCE OR DEMOLITION	If the known cultural heritage sites cannot be avoided during construction and a decision has been taken to excavate through these sensitive sites, then: The Heritage Specialist is to be consulted and is to assess the site and design proposal, and determine the extent of impact A Permit Application is to be submitted by the Heritage Specialist to Amafa to request permission to disturb/damage/destroy the known cultural heritage site located in close vicinity (20m) of the proposed route. The DAEARD are to be informed of the outcome.

6. NEW DISCOVERIES

Table 6.1 Protocols and Responsibilities for New Discoveries

STEP 1: INDUCTION TRAINING	The Contractor is responsible for ensuring that staff are appropriately trained in the implementation of the EMP and its associated reports. The Environmental Consultants are to provide training material illustrating the kinds of heritage resources that may be encountered during construction. Clearing and excavation staff should be particularly mindful of new discoveries and are to be fully aware of the procedures and communication structures that are to be followed following a new discovery.
STEP 2: CEASE WORK	In the event of a new heritage discovery, work is to immediately cease on site, the area cordoned off, and the machinery and site left exactly as it was at the time of discovery. Spoil or waste derived from the site in question is to remain in situ until such time as the site has been assessed.
STEP 3: CONTACT ESO & ECO	The staff are to immediately inform the ESO, who is to immediately assess the site and confirm that the discovery has been appropriately protected. The ESO is to contact the ECO, who may wish to do the same.
STEP 4: CONTACT SPECIALISTS	The ECO is to contact the Heritage Specialist, who will inspect the site and determine an appropriate buffer width, an appropriate barricade, and which authorities or additional specialists may need to be contacted. The Heritage Specialist is to communicate the nature of the discovery, the extent of impact and the authority requirements to the Environmental Consultants. The authorities may require a site inspection to better determine a way forward.
STEP 5: DETERMINE WAY FORWARD	**Protection *in situ*:** it may be determined by the Heritage Specialist that a barricade with a suitable buffer width will protect the discovery from the construction activities, and the Contractor may then continue works on instruction from the ECO and ER. **Protection through rescue:** it may be determined by the Heritage Specialist that the resource will need to be rescued and relocated to a suitable facility. This may only occur on authorisation from the authorities (permit from Amafa), and the Contractor may only continue works on instruction from the ECO and ER. **Disturbance of demolition:** it may be determined that the resource will be disturbed or demolished by the construction activities. This may only occur on authorisation from the authorities (permit from Amafa), and the Contractor may only continue works on instruction from the ECO and ER. If authorisation is not granted then the Consulting Engineers will need to reconsider the design and routing.
STEP 6: REPORTING REQUIREMENTS	The ESO is to record the discovery and the actions taken in the EIRF. The ECO is to audit this process in the monthly monitoring and auditing procedures. The nature of the discovery, the action taken, the role players consulted and the outcome are to be documented in the audit report which is to be forwarded to the DAEARD and Amafa. The Heritage Specialist is also to record all processes and findings, and keep written documentation of all communications with other specialists or the authorities. Any monitoring requirements are to be clearly communicated to the Environmental Consultants. Public participation may be required, and proposed amendments to the construction footprint are to be approved by the DAEARD should they be needed.