

eThekwini Coastal, Stormwater & Catchment Management Department



Environmental Scoping for the Proposed Widening of the Lower Umgeni River

Final Scoping Report

Project No: J25130A

EIA No: EIA/ 6008

December 2005

**eTHEKWINI COASTAL, STORMWATER AND CATCHMENT
MANAGEMENT DEPARTMENT
PROPOSED WIDENING OF THE LOWER UMGENI RIVER
FINAL SCOPING REPORT**

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ABBREVIATIONS

CSIR	Centre for Science and Industrial Research
DAEA	Department of Economic Affairs, Environment and Tourism
DEAT	Department of Environmental Affairs and Tourism
DSR	Draft Scoping Report
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
FSR	Final Scoping Report
HKS	Hill Kaplan Scott Incorporated Consulting Engineers
IAPs	Interested & Affected Parties
PPP	Public Participation Process
ROD	Record of Decision

1 INTRODUCTION AND BACKGROUND

1.1 Background Information

The Umgeni Business Park, which is located in the flood plains of the Umgeni River just inland of the river mouth, was developed during the past 20 years in what is known as the Springfield Flats. It contributed significantly to the expansion of industrial and business areas within eThekweni municipal area. (Note that the Umgeni River is also known as the Mgeni River)

The development of the Umgeni Business Park went ahead based on the understanding that a section of the Umgeni River would be widened through provision of flood protection works (which in technical terms is referred to as canalisation) to reduce the flooding risk to within acceptable levels.

The eThekweni Coastal, Stormwater & Catchment Management Department (hereafter referred to as eThekweni unless otherwise specified) phased in the widening when the southern embankment of the relevant section of the Umgeni River was 'trimmed' during the mid 1980s. The embankments were stabilised with vegetated gabion type structures for flood protection. A section of the Umhlangane River, a tributary to the Umgeni River, was also widened at the time.

eThekweni proposes to continue with the second phase of the project, by further widening the Umgeni River through work along an approximate 1 km section of its the northern embankment, in order to further reduce the flooding risk of the Umgeni Business Park. The proposed site to be affected is location approximately 3 km inland of the river mouth.

The proposed second phase of the widening project (hereafter referred to as the Umgeni Project for the purposes of this document) constitutes the provision of flood protection works, in the form of vegetated gabion type structures, for the northern river embankment at the desired river width. It is proposed to not line or excavate the riverbed.

This Document constitutes the Final Scoping Report (FSR) of the proposed Umgeni Project. The FSR supports the Environmental Impact Assessment (EIA) Application (see **Appendix A**), which has been assigned the EIA Number EIA/6008 by the Department of Agriculture and Environmental Affairs (DAEA).

1.2 Legal Requirements

1.2.1 Environmental Conservation Act

The Environmental Conservation Act (Act No.73 of 1989) makes provision for the publishing of regulations in Sections 21, 22 and 26 of the Act to control activities, which may have a detrimental effect on the environment. In September 1997, the EIA regulations (regulation numbers 1182 and 1183 as amended by Government notice No.7351 in May 2002) were published by the national Department of Environmental Affairs and Tourism (hereafter DEAT).

These regulations define the “construction, erection or upgrade of canals and channels, including structures causing disturbances to the flow of water in a river bed, and water transfer schemes between water catchments and impoundments” (Section 1j) as scheduled activities and activities which therefore require environmental authorisation, only following a formal EIA process.

On the basis of the outcomes of the Environmental Scoping Study, the need for a full-scale EIA will be determined.

Other potential activities related to the Umgeni Project construction work may also constitute scheduled activities and are included in the EIA application (EIA/6008) and are thus covered in this Scoping Study. These activities includes the relocation of affected water and sanitation services and may for example include implementation of fuel storage facility and construction or upgrade of access roads.

1.2.2 National Water Act

The National Water Act No 36 of 1996 is founded on the principle that National Government has overall responsibility for and authority over water resource management. This includes the equitable allocation and beneficial use of water in the public interest. A person can only be entitled to use water if the use is permissible under the Act.

The Act defines water use broadly, and as per Section 21(i) includes “altering the bed, banks, course or characteristics of a watercourse”. The Act specifies that water use must be licensed unless specific exemptions apply.

eThekwini received advise from the regional DWAF office, that the Umgeni Project is considered to be a ‘water use’ as defined by the Act. Accordingly eThekwini has completed and submitted the application forms for consideration to DWAF. This Draft Scoping Report has been included as an attachment to the application.

The Scoping Study covered in this report informs the abovementioned application to DWAF.

1.3 Details of the Applicant

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2 BRIEF DESCRIPTION AND SCOPE OF THE DEVELOPMENT

eThekwini proposes to complete the second phase of the widening of the Umgeni River, with the purpose of protecting existing upstream developments in the Springfield Flat/Umgeni Business Park area from flooding.

2.1 Site Description

The proposed Umgeni Project constitutes the widening of a section of the Umgeni River approximately 3 km from the river mouth on the KwaZulu-Natal shoreline. The particular river section stretches from just east of Connaught Bridge (North Coast Road, R102) to approximately 1 km upstream in a westward direction.

The development will take place at Umgeni Business Park, which is located within the boundaries of the eThekwini Municipality, approximately 10 km north of Durban Central Business District (CBD).

The affected site spans approximately 6 ha and is almost entirely surrounded by the Umgeni Business Park, apart from the area east of Connaught Bridge, which borders Umgeni Park (Riverside) residential area.

Certain business premises will be directly affected, as the proposed new embankment will 'cut' into these premises to widen the Umgeni River. eThekwini will however acquire the affected properties through normal council acquisition procedures or through expropriation for which the Department of Local Government Affairs and Traditional granted formal approval on 19 July 2005. Surrounding businesses may also be affected if access is required via their properties, which if required will be done by special arrangements with the property owners.

The site is located adjacent to an area that can be regarded as a major traffic node, linking northern and central eThekwini via rail and road. Some nearby residential developments exist and the Umgeni estuary and surrounding areas provide for recreational opportunities.

The proposed development will thus take place in an environment that has been heavily modified and influenced by human activities.

The location and extend of the proposed development together with the details of affected properties is shown in **Figure 1** and **Figure 2**. Refer to **Plate 1** for a view of the affected site.

2.2 Project History

During the early 1980's the then Durban Corporation City Engineer's Department embarked on a project to canalise (widen) a total length of 5.25 km of the Umgeni River and its small tributary, the Umhlangane River. This was at a distance of approximately 3 to 4 km from the Umgeni River Mouth.

The canalisation had the purpose of reclaiming approximately 450 ha of floodplain for industrial purposes at the Springfield Flats. At the time, this increased land zoned for industrial use in Durban by 23%.

Project work on the southern side of the Umgeni was completed by the mid-1980's. This included work on the Umhlangane River. Industrial and business developments within the Springfield Flat area followed and are now known as the Umgeni Business Park.

Due to restrictions on acquisition of properties the second phase of the development, consisting of the widening of the Umgeni River's northern embankment, was delayed. This puts a large portion of the Umgeni Business Park and beyond at risk of being significantly affected by floodwaters.

eThekweni is now proposing to continue with the project by completing the widening of the Umgeni River through provision of flood protection works to the northern embankment.

2.3 Project Motivation

The Umgeni Project is thus motivated by the need to continue with the flood attenuation project that was initiated as part of eThekweni's development plans for the Umgeni Business Park and surrounding area.

The widening of a section of the lower Umgeni River provides for additional flood protection measure for the properties and infrastructure already established within the floodplains of the river. Although flooding may still occur during extreme storm events, the area affected by the floods will be much reduced. In addition the risk of flood damage in areas that will still be affected will be significantly reduced.

Without further flood attenuation, properties adjacent to the proposed Umgeni Project site and upstream at the Umgeni Business Park will remain prone to unacceptable high and frequent flood risk, which could potentially include loss of life. (**Section 2.3.1** and **Section 2.3.2** provide further background to flooding risk and attenuation.) **Figure 3** provides an illustration of the 1 in 100 year floodlines at Umgeni Business Park.

2.3.1 1987 Floods

The flood of 1987, which was estimated by HKS (1988) to be between 65 and 130 year storm event, affected a large portion of the Umgeni River floodplain in which the Umgeni Business Park was established. Photo's included in **Appendix B** illustrates the flood damage that was caused on the private properties on the embankment in Springfield Park.

After the floods, property owners backfilled some sections of the embankment and a few new buildings were erected.

The 1987 thus provide for a typical example of flood impact that can be expected during future similar or higher flood events.

2.3.2 Results of Floodline Studies

eThekwini commissioned a number of floodline studies which informed the motivation for the Umgeni Project. Refer to **Section 3.4** and **Section 5.2** for further details.

A summary of key conclusions drawn from the floodline study, which was undertaken by HKS in 1989, indicate that the Umgeni Project will:

- Significantly reduce flood levels in the upstream section of the Umgeni River which passes through the Umgeni Business Park
- Result in only a slight increase of flood levels in the Umgeni estuary between Connaught Bridge and Athlone Bridges during major flood events
- Substantially reduce erosion depths in the vicinity of Connaught Bridge.

SRK et al undertook a detailed assessment for the 1:50 and 1:100 year floodlines during 2000. The title of this report is "Umgeni River – Inanda Dam to Sea Flood Risk Assessment Study - Hydrology". This investigation included a detailed assessment of the hydrology, survey and scour component of the flood level. This report concludes as follows:

- The operating level of the Inanda Dam has a significant attenuation impact on floods less than 10-year events if the dam is maintained at less than approximately 60% of full supply capacity
- For more extreme events (1:20 year and higher) this attenuation diminishes totally
- The fact that the Inanda dam is a water supply dam makes it highly unlikely that it will ever operate at less than 100% of full supply capacity

Recently, in June 2005, SRK has completed a further detailed investigation on the effect of the Umgeni Project on the 1:100 year event floodline of the Umgeni River. The result of this investigation indicates that the Umgeni Project will decrease the upstream floodlines by a depth of between approximately 0.5m and 1.0m for a number of alternative embankment configurations, which were assessed during the planning process. This would significantly reduce the flooding risk at the Umgeni Business Park, although certain lower lying properties might still have ingress of floodwater during major floods. This further justifies the rationale behind the widening of the River.

2.4 Description of Proposed Project Phase

Following land acquisition of the required embankment properties eThekwini proposes to widen the Umgeni River through the provision of protection works for its northern embankment. A vegetated gabion type embankment structure is proposed. The riverbed will not be lined or excavated, apart from excavations required for construction of the embankment itself.

The Umgeni Project will affect an estimated 6 hectares of land next to the northern embankment. Approximately 30 properties will be affected, most of which were already significantly impacted by the 1987 floods. eThekwini owns some of these properties, most of which are within the river reserve, and are finalising acquisition of other properties that will be affected. eThekwini has already formally given notice of termination of leases to private organisations that were leasing any of their affected properties in terms of their lease agreements.

eThekwini will undertake additional geotechnical investigations to determine the nature of the underlying geology. This will inform the planning process and detail design of the Umgeni Project.

Existing manmade structures in the affected site such as buildings and hard standing will be demolished prior to commencing with excavations and grading of the embankment.

As the proposed widening will take place below existing road and rail river crossings, project design and planning will take these transportation infrastructures into consideration. The original bridge design for these crossings incorporated adequate flood protection. The project will thus have no direct impact on the rail and road infrastructure.

Provisions have been made in the design of the modified embankment to relocate the affected sewer and water mains and to provide for stormwater outlets into the river. These services relocation thus form part of the Umgeni Project and this EIA application (EIA/6008).

The design of the embankment makes provision for a foot trail above the floodline.

Refer to **Figure 2** for more detail. **Figure 4** provides a sketch of a cross section of the embankment with an indication of how the proposed flood protection works will be implemented.

2.5 Construction Time Frames

eThekwini plans to commence with the construction activities by December 2005. It is estimated that construction will be completed within two years, but this depends on the progress with the acquisition of the affected properties and the granting of the relevant permits from DWAF.

3 PROPOSED APPROACH TO THE SCOPING STUDY

3.1 Objectives

The objectives of the Environmental Scoping Study are as follows:

- Assess alternatives to the proposed Umgeni Project
- Determine the overall biophysical and socio-economic impacts of the proposed Umgeni Project
- Determine the concerns and obtain input from Interested and Affected Parties
- Make recommendations to be considered by the Department of Agriculture and Environment Affairs (DAEA)
- Identify environmental impacts requiring mitigation and determine appropriate mitigation measures
- Provide for the basis for an informed Environmental Management Plan (EMP) to mitigate and manage environmental impacts associated with construction and upgrading activities.

Following consultation with Ms Joyce Green Govender of DAEA (Pietermaritzburg) on the 31st February 2005, it was confirmed that a formal EIA process is required for the proposed development. The methodology and programme for undertaking the necessary environmental studies has been structured to meet legal requirements as well as those required by the eThekweni Municipality.

The approach for the EIA is described in the sections that follow.

3.2 Consultation with Environmental Authorities

Prior to commencing with the scoping study ARCUS GIBB consulted with Ms Mavis Padayachee of DAEA on the 03rd March 2005, regarding the Department's requirements for the Proposed River Widening. Ms Padayachee advised that an Environmental Scoping Study was required for the proposed development.

ARCUS GIBB completed the applicable EIA application forms (see **Appendix A**) and Plan of Study for Scoping (PoS, see **Appendix C**). These documents were then submitted to DAEA on the 16th May 2005 as required by the EIA regulations.

DAEA awarded the application with the reference number **EIA/6008** and accepted the PoS on the 10th June 2005.

Correspondences with DAEA are included in **Appendix D**.

It is understood that DAEA will provide comment on the following documentation:

- Plan of Study for Scoping
 - Draft Scoping Report (DSR) - (on request only)
 - Final Scoping Report (FSR).
-

3.3 Plan of Study for Scoping

A copy of the Application Form and the consultant's Declaration of Independence are given in **Appendix A** respectively. The approach proposed in the PoS was followed during this scoping study. **Appendix C** includes the index table for PoS that was submitted to DAEA as part of the EIA application.

3.4 Information Review

ARCUS GIBB have reviewed readily available environmental information and documentation. This included information eThekweni provided on project design and previous correspondence with property owners as well as floodline studies as undertaken by HKS and SRK (see references in **Section 12**).

Documents reviewed included the following:

- Hill Kaplan Scott (HKS) Incorporated Consulting Engineers; (September 1989); Umgeni River Canal Erosion; Report No GH/jh/13817 – 4131
The report investigated the effects of the proposed widening of the Umgeni Canal in the vicinity of Connaught Bridge on flood levels and erosion depths in this area for a flood similar to that experienced in September 1987.
- Hill Kaplan Scott (HKS) Incorporated Consulting Engineers; (June 1988); Umgeni River Report on September 1987 Floods; Report No RDB/pg/12653
The report deals with the Umgeni flood of September 1987 and the preliminary evaluation of data collected both during and immediately after its occurrence. It provides a record of the hydraulic and hydrological analyses undertaken for possible future more detailed assessment.
- Steffen, Robertson and Kirsten; (June 2000); Umgeni River – Inanda Dam to Sea, Flood Risk Assessment Study – Hydrology, Report No 274632/
- SRK Consulting Engineers and Scientists, July 2005; Umgeni Canal Assessment, SIMM/coxj/0507052.

These investigations will assist DWAF and DAEA in making informed decision about the proposed Widening of the Umgeni River.

3.5 Site Inspection

ARCUS GIBB together with the heritage specialist undertook an inspection of the proposed Site on the 25th April 2005.

The purpose of the inspection was to:

- Gain a general understanding of the site and its surroundings
- Produce a photographic record that can be used in Information Documents, meetings, the DSR and the FSR
- Identify likely environmental impacts and potential mitigation measures
- Gain an appreciation of the engineering and planning constraints on the project.

A member of the eThekweni project team accompanied the ARCUS GIBB project team on the site inspection to clearly identify the proposed site and to explain the particular engineering design and planning constraints.

3.6 Public Participation Process

The EIA Regulations stipulate that some form of Public Participation Process (PPP) is required in Environmental Scoping Studies, which was thus undertaken as detailed below.

3.6.1 Objectives

The main objectives of the PPP are to:

- Inform Interested and Affected Parties (IAPs) about the proposed project and the scoping process
- Establish lines of communication between IAPs and the project team
- Provide opportunity to all parties to exchange information and express their views and concerns
- Obtain contributions of IAPs and ensure that all issues, concerns and queries raised are fully documented
- Identify all the significant issues that need to be addressed in the EIA, if warranted.

3.6.2 Approach

In order to fulfil the above-mentioned objectives, the following tasks were undertaken:

(a) Approval

DAEA approved the proposed PPP which was submitted as part of the PoS.

(b) Advertising

The scoping process was advertised in the regional Newspaper, *The Mercury*, on the 16th June 2005 and the local newspaper, *The North Glen News*, on 17th June 2005. The purpose of the advertisement was to notify IAPs about the proposed development and to invite them to register and attend an Information Sharing Meeting (ISM). Refer to **Appendix E** for the copies of the advertisements.

(c) Compilation of Database

An IAPs database was developed for this project, which includes the names, organisations and contact details of the IAPs (see **Appendix F**). The database was expanded through networking as new IAPs responded to the advertisement placed in the newspaper for the proposed Works. The database totals approximately 100 organisations and individuals and includes relevant authorities, local and ward councillors, neighbouring property owners, local residents and non-governmental organisations (NGOs).

The key organisations and stakeholders involved in the public participation process are:

- Department of Agriculture and Environmental Affairs (DAEA)
- DAEA Coastal Working Group
- KZN Department of Water Affairs and Forestry (DWAF)
- KwaZulu-Natal Department of Minerals and Energy (DME)
- Department of Land Affairs
- eThekweni Development Planning and Management Unit
- eThekweni Health Department
- eThekweni Traffic and Transportation
- eThekweni Roads
- eThekweni Real Estate
- eThekweni Water and Sanitation
- eThekweni Parks
- eThekweni Recreation
- Spoornet
- Ezemvelo KwaZulu-Natal Wildlife
- Amafa / Heritage KwaZulu-Natal (Amafa)
- Keeping Durban Beautiful Association
- Wildlife Environment & Society of South Africa (WESSA).
- Islamic Society
- Affected and neighbouring property owners
- Local Community

(d) Background Information Document

A Background Information Document (BID) about the proposed Umgeni Project was compiled and forwarded to IAPs registered on the database (see **Appendix G**). The BID was also handed out during the Stakeholder meeting to local councillors, to further distribute copies to their organisation and IAPs they are aware of.

The BID introduces the proposed project and contains background information on the development proposal, the proponent, consultants and proposed process to be followed. The BID included an invitation to a public meeting and a locality map. IAPs were contacted by means of formal letters, emails, telephone and faxes. (Refer to **Appendix H** for the relevant correspondence.)

(e) Stakeholder Meetings

During the initial consultation with DAEA, KwaZulu-Natal Department of Water Affairs and Forestry (DWAF) and other key authorities it was suggested to meet to discuss the proposed project, its potential impacts and the requirements these authorities may have.

Accordingly ARCUS GIBB held one stakeholder meeting on the 14th June 2005 to which all key authorities were invited (see Attendance Register in **Appendix I**). The purpose of the meetings was to offer key stakeholders an opportunity to render advise on any requirements and raise issues and concerns on the proposed Umgeni Project. All the comments, concerns and issues raised during the meeting are covered in **Section 7.2**, whilst proposed alternatives are discussed in **Section 8**.

(f) Information Sharing Meeting

All IAPs were invited to the public meeting held at the eThekweni Training Centre in Springfield Park, a convenient venue closer to the area for the proposed development, on the 21st June 2005 at 17h00. Fourteen IAPs, mostly property owners or their representatives, attended the ISM (see Attendance Register in **Appendix I**).

The purpose of the meeting was to offer IAPs an opportunity to raise issues, concerns and any proposals on the proposed Umgeni Project. All the comments, concerns and issues raised during the public participation process including proposed alternatives are discussed in the **Section 7.2** of this report. Additional IAPs were registered on the database.

3.7 Identification and Assessment of Impacts

The assessment examined the existing environment and the likely impacts associated with the construction and operational activities of the Project.

The assessment identified those activities that require management action and mitigation, or that require further detailed assessment. Information on the significance of specific issues that is readily available and provided by stakeholders is covered in **Section 7** and Summarised in **Table 11.1** of **Section 11** of this Scoping Study.

3.7.1 Specialist studies

ARCUS GIBB has made enquiries with various authorities to determine their requirements for the Project. See **Appendix D** for relevant correspondence. From these discussions ARCUS GIBB has concluded that, in aid of informed decision making, impacts on biodiversity and archaeology/heritage, are considered worthy of specialist input during the Scoping Study phase.

Specialists input was included in the Scoping Study as described below:

- Biodiversity

An Ecologist (refer to **Section 4.3** for further information) was appointed to undertake a preliminary biodiversity survey of the Umgeni Project area in order to assess the potential loss of habitats as well as other potential impacts of the Umgeni Project and associated effect on biodiversity. **Section 5.2.3** summarises the description of the ecological environments and **Section 8.3.2** covers the identified impacts as determined by the survey, whilst the detailed Ecological report is included in **Appendix J**.

- Archaeology/heritage

An Amafa accredited heritage specialist (refer to **Section 4.3** for further information) was appointed to assess the potential occurrence of significant heritage artefacts, graves and cultural sites in the Umgeni Project area on a preliminary basis and advise on any suitable mitigation measures. **Section 5.3.5** summarises the description of the heritage environments and **Section 8.4.6** covers the identified impacts as determined by the survey, whilst the detailed Heritage report is included in **Appendix K**.

3.8 Scoping Report

3.8.1 Compilation of the Draft Scoping Report (DSR)

Section 3.2.3.1 of the EIA Regulations (DEAT, 1998) contains a suggested format for Scoping Reports. This has been used in the formatting of the DSR.

This DSR includes the following components:

- Brief description of the project and project alternatives and the affected environment
- Brief description of how the environment could be affected by the project proposals
- Description of the environmental issues identified during the consultation process
- Description of the consultation process which will include the IAP Database and copies of all IAP correspondence as an appendix

- “Technical” appraisal of the potential environmental impacts of the project proposals as well as the different alternatives and potential mitigation measures
- Conclusions and recommendations on the way forward which will include recommendations on mitigation measures and the strategy for resolving issues
- Reference list.

IAPs were provided with an opportunity to view this DSR and to provide further comment, which was incorporated in this final report.

The DSR was reviewed internally by a Senior Environmental Scientist as part of ARCUS GIBB’s ISO 9001 Quality Management System. The DSR was then submitted to the client for review of factual accuracy prior to public submission.

3.8.2 Comments Period

The DSR was lodged for a period of three weeks at the public libraries in Springfield Park, Durban Central Library and Durban North for public review. Stakeholders registered on the IAP Database were timeously informed about this placement through direct contact; and were invited to review the documentation and provide written comment within a three-week Comments Period.

3.8.3 Compilation of the Final Scoping Report (FSR)

The DSR was updated with IAPs comments received during the Comments Period in a written form to finalise the scoping report. (Refer to **Section 10**)

3.8.4 Authority Review

The FSR will be submitted to DAEA, who will then determine whether or not further studies are required (i.e. undertake the EIA phase), or they may issue a Record of Decision (RoD) if there are no further significant environmental issues which require further investigation.

ARCUS GIBB will inform IAPs on the project database of DAEA decision, as per the Departments Standard Conditions of Authorisation.

3.9 Proposed Timeframe

Should all stakeholders approve the proposed river canalisation project, and the conceptual designs and the relevant DWAF permit are approved, construction is envisaged to commence in December 2005

4 ENVIRONMENTAL TEAM

4.1 ARCUS GIBB

ARCUS GIBB's Environmental Division has a proven track record in the planning, co-ordination, management and execution of a wide range of environmental projects. Our team consists of a number of highly qualified and experienced environmental professionals.

The key areas of expertise include:

- Environmental Impact Assessments (EIA)
- Environmental Management Systems (EMS)
- Environmental Management Programmes (EMP)
- Environmental permit applications
- Environmental sensitivity analyses
- Environmental monitoring and auditing
- Integrated catchment management plans
- Remediation services
- Waste management.

To this end, the core team, who assisted with the scoping study, consisted of our Mr Stanley Mgutshini (Director) as Project Director, Ms Jaana Ball (Environmental Group Leader) as Project Reviewer and Ms Gisela Fechter (Chemical Engineer) as Project Leader. Ms Nkhensani Khandhela (Environmental Scientist) act as Project Scientist and assisted with data collection and report compilation assisted by Gisela. Mr Nishal Mistry (Civil Engineer) assisted with the review of available floodline study reports and information.

4.2 CSIR

Ecologists from Environmentek, CSIR, Ms Shamilla Pillay and Mr Steven Weerts, assisted the core project team by providing specialist input into scoping concerning impacts on biodiversity.

Environmentek has extensive experience in assessing biodiverse habitats and identifying significant biota that could potentially be impacted by the proposed Umgeni Project.

4.3 Umlando

Mr Gavin Anderson (Archaeologist and Heritage Specialist), Umlando: Archaeological Tourism & Resource Management, assisted the core project team by providing input to the scoping study with regards to the relevant heritage environment. Umlando is accredited by Amafa.

5 DESCRIPTION OF ENVIRONMENT

5.1 Introduction

The environmental setting of the site is described in this section while the environmental issues that were identified to be of significance in the proposed development are outlined in **Section 8**.

Outside of the Umgeni River Reserve, the Umgeni Project most of the environment surrounding the site has been impacted and disturbed by human activities.

Features of the original natural environment, as described in more detail in **Section 5.2.3** remain within the Umgeni River Reserve, but these are affected by significant flooding events and alien invasive plants.

Table 5.1 provides a summary of the environments surrounding the Umgeni Project site, whilst **Figure 1** and **Figure 2** provide an overview of the site and its surrounding areas.

Table 5.1: Environments Surrounding the Umgeni Project Site

Direction	Description
North	Approximately ten business premises lie between the affected site and Inanda and Riverside Road. The residential area of Seacow Lake and Umgeni Park are located to the north of these two roads at a distance of approximately 400m and 200m respectively from the affected riverbank.
East	Durban Solid Waste Garden Refuse depot and beyond this the Umgeni Bird Park and the Umgeni Estuary
South	Umgeni River and on its southern embankment rail and electrical servitude as well as Umgeni Road. A portion of the Morningside residential area is located on a hill, which overlooks the Umgeni Project site, see Plate 2 . A historic quarry lies between Umgeni Road and Morningside, which is now occupied by an electrical substation. Southwest of the site lies the southern floodplain into which the Umgeni Business Park extends.
West	The west of the Umgeni Project site borders on an Islamic graveyard, which extends in a narrow strip northward, see Plate 3 . Next to the graveyard to the west lies the NCP manufacturing facility (refer to Plate 4), beyond which lies the northern floodplain into which a further portion of the Umgeni Business Park extends.

5.2 Biophysical Environment

5.2.1 Topography and Drainage

The section of the Umgeni River for which alterations are proposed falls into the lower Umgeni catchment and is located just upstream of the estuarine plain that discharges

into the Indian Ocean. Floodplains exist just upstream of the proposed site, which have been fully reclaimed for light industrial and business developments.

The Umgeni River originates in the foothills of the Drakensberg Mountain Escarpment and is approximately 230 km in length from its source to its mouth. The catchment is estimated at 4450 km² and receives an estimated mean annual precipitation of 930mm. The catchment falls in a summer rainfall region with more than 80% of rainfall occurring between October and March.

In the upper region the Umgeni River passes mainly through natural and agricultural regions. This is before reaching Pietermaritzburg (inland) and Durban (at the coast) where most of the catchment land-cover is urban consisting mostly of residential, industrial, and commercial development associated with these cities. The approximate land-cover of natural, degraded bush/shrub land, agricultural and urban environments within the Umgeni Catchment are 52%, 3%, 37% and 8% respectively.

The lower Umgeni Catchment is drained by a number of rivers, of which the closest upstream of the affected river section include the Umhlangane, Palmiet, and Molweni. Just before reaching the estuarine plain the Umgeni River cuts its way between the Riverside and Windsor Park creating cliffs and gorges.

Dams have been constructed in most South African rivers to provide for the much needed water storage and supply to its population. The Midmar, Albert Falls, Nagle and Inanda Dam have been constructed within the river and regulate water storage and release in the Umgeni Catchment. DWAF regulates these systems to ensure that human consumption and provision of ecological reserve are optimised.

The outflow of the Inanda Dam, which is the lowest dam in the Umgeni River, contributes significantly towards the regulation of flowrate towards the lower Umgeni River during normal conditions. However during floods, particularly when dams are full, flowrates in the lower Umgeni River would be similar to that of the natural state. Thus once the Inanda Dam is full it provides no flood mitigation for the lower catchment.

According to HKS (1989) the lower Umgeni River and Estuary bed consists of sand and is thus highly erodible. Erosion is particularly significant during major floods as a result of which the river bed changes.

Due to the 'bottle neck' created by the narrow section of the river at the proposed Umgeni Project site flow velocities, turbulence and associated erosion in this section of the riverbed is particularly high during major flood events. In addition to flood attenuation, widening this section of the river would thus also result in a reduction of localised erosion of the riverbed.

5.2.2 Geology and Soils

The site is underlain by alluvium of the Quaternary age. Historically, sea levels were depressed by approximately 100m and deep channels were eroded into the bedrock. It is likely that the alluvium, consisting predominantly of silts, sands and clays is up to 30m thick.

The alluvium is underlain by Permian age dark grey shales and sandstone interspersed with boulder shale of the Karoo sequence and Dwyka formation.

A SW–NE trending fault has been identified on the southern edge of the alluvium.

Quarries/mines can be found relatively near the site, which were used to mine material for brick as well as to quarry for stone.

The above information has been derived from the 1:250 000 Geological Map of Durban 2930 (1988).

The Umgeni Estuary sandy bed is thus highly erodible with the result that it undergoes significant changes during major floods due to erosion and sedimentation. This changes the bed level. In its natural state, before the river was confined by canalisation and the various developments, the alignment of the river would thus probably have been altered after major floods.

eThekwini has confirmed geological and soil conditions of the area. This data will be used during detailed design stage. Details of the soil investigations that were carried by eThekwini City Engineers Department are provided in **Appendix L** of this report.

5.2.3 Ecological Systems

The floodplain of the lower Umgeni River, having provided valuable land for business and residential development, has only small pockets of natural environment remaining on the fringes of streams and the river itself. Apart from loss of natural habitat, remaining ecological systems are heavily impacted by aspects of urbanisation such as effluent discharges, litter, dumping of waste and uncontrolled encroachment of developments into streams and the river itself, see **Plate 5**.

Although the lower reaches of Umgeni River has lost its abundance of its flora, fauna and bird species, a number of coastal species do exist. The information presented in this section has been supplemented with the results of the Preliminary Biodiversity Assessment conducted by the CSIR in July 2005 (see **Appendix J**). An Orthophoto map showing the eThekwini D'Moss areas is attached as **Figure 5**.

(a) Umgeni River – Upstream of Project Site

The most important aspects concerning upstream environments that are of relevance to the ecological description for the Umgeni Project are the regulation of water flow through the various dams (refer to **Section 5.2** above), encroachment on the river flow paths and floodplains as well as the influences on water quality.

Ecological systems of the river are no longer in their original natural state due to the regulation of the water flow, which influences both water flowrate and water quality.

Water is released from the Inanda Dam continuously to provide for the ecological reserve, as regulated by DWAF. This sustains in-stream biota during normal flow conditions.

Ingress of developments into the floodplains has probably already resulted in a significant impact on ecological habitat systems upstream of the project site. The ingress of developments into the floodplains also resulted in floodwaters to be more confined to the normal river bed which results in an increase of flow velocity in the river during floods, which in turn result in higher levels of erosion of the river bed and

embankment. Without widening of the river in certain 'narrow' sections this erosion and siltation would be unacceptable high both from a human development and ecological risk. Silt and sediments carried from upstream erosion could potentially be deposited in the estuary with negative effect on the estuarine ecological system.

The *State of the Rivers Report, uMngeni River and Neighbouring Rivers and Streams* is based on the findings of river surveys that were conducted on the Umgeni, Umlazi, Umhlatuzana and Umbilo rivers between 1992 and 2002 as part of the implementation of the DWAF River Health Programme in KwaZulu-Natal. According to this report the water quality in the Umgeni River is fair as it leaves the Inanda Dam, due to the purification of the water in the Inanda Dam. Despite efforts from environmental authorities to control pollution, the water quality deteriorates as the river passes through urbanised areas and becomes poor as the river enters the estuary.

The deterioration of water quality is probably due to the impact of large volumes of pollutants from urban activities, such as treated and untreated sewage and industrial wastewater, litter, illegal waste dumping and sand winning.

In addition to these existing impacts the environmental authorities have authorised a scheme for transfer of treated sewage wastewater from the Ohlanga River Catchment to the Umgeni River Catchment to avert serious ecological impact on the sensitive and pristine Ohlanga estuary. This scheme is still to be implemented.

(b) Umgeni River – At the Project Site

Relative to the Umgeni River system, the project site covers only a very small area. Like the surrounding areas, the project site is significantly impacted by human activity, past floods and ingress of alien vegetation.

Flora

The CSIR undertook a vegetation survey of the project site on 2nd August 2005. The types of vegetation communities present were noted in the field and lists of species were recorded in the affected area and in areas immediately above and below this. The CSIR noted that these were essentially disturbed secondary habitats and in terms of the vegetation there were many opportunistic alien species.

The vegetation above the banks of the river consisted of a mixture of exotic weedy species (e.g. *Riccinus communis*, *Chromolaena odorata*, *Cardiospermum grandiflorum*) and few indigenous species generally characteristic of highly disturbed secondary habitats. This habitat may best be described as open scrub consisting of secondary grasses (e.g. *Cynodon nlemfuensis*, *Sporobolus africanus*, *Panicum maximum*), with shrubs (e.g. *Abutilon sonneratianum*, *R. communis*, *C. odorata*, *Lantana camara*, *Solanum mauritianum*) and occasional trees (e.g. *Erythrina lysistemon*, *Trema orientalis*, *Ficus natalensis*, *Melia azedarach*). The exotic creepers, *Ipomoea purpurea* and *C. grandiflorum*, were also prolific in this habitat. At the lower section of the study area (Riverside Road end) part of this area had previously been developed into a grassed recreational area.

Of the outer banks those that were vertical were essentially devoid of vegetation except for occasional tufts of grasses such as *S. Africanus*. Sloping banks were better vegetated with taller grasses (e.g. *Phragmites mauritianus*, *Arundo donax*,

Digitaria eriantha), weedy shrubs such as *C. odorata* and occasional trees (e.g. *F. natalensis*, *M. azedarach*, *P. guajava*, *T. orientalis*).

The inner gently sloping banks were characterized by more hygrophilous vegetation. The landward section and raised islands within this habitat were characterized by tall stands of *P. mauritianus* and *A. donax*. Occasional trees such as *Ficus sur*, *T. orientalis* and *F. natalensis* had also colonized these areas since the last major flood. Closer to the channel *Phragmites australis* dominated while at the waters edges and on islands within the channel the grass *Echinochloa crusgalli* was the dominant species.

During this survey the vegetation upstream and downstream of the affected area was also briefly surveyed and was found to have an essentially similar community structure and species composition to that of study area.

Refer to **Appendix J** for detail lists of encountered species.

Fauna

This scoping study did not include specific faunal surveys. However the CSIR made a number of observations based on their site visit and specialist opinion. From this preliminary survey the CSIR concluded that the affected habitat is not expected to contain any rare or endangered species.

In the terrestrial environment the only fauna incidentally noted were two pairs of Egyptian geese (*Alopochen aegyptiacus*). The representative of one of the neighbouring industrial sites reported that their site is frequently visited by a pair of fish eagles. The habitat could however, support several species of small mammals (mice, moles), lizards (skinks, agamas) and snakes. The plant community that was present did not indicate any species-specific insect-plant relationships with the exception of those of the *Ficus* species with their species-specific pollinator relationship with Agaonid wasps. Trees of this species were however well represented outside the affected area.

At the waters edge, two Nile monitors (*Varanus niloticus*) were noted. In the open water a pair ducks (South African Pochard - *Netta erythrophthalma*) were noted in the deeper water of the channel. The lower banks and vegetated backwater areas are expected to support several frog species. The channel area with its marginal vegetation is also expected to support a very rich invertebrate fauna. This would include larger crustaceans such as the shrimps and crabs (e.g. *Caridina* spp., *Palaemon* spp., *Macrobrachium* spp., *Varuna* sp.) as well as the much smaller amphipod, copepod, ostracod etc. species. The characteristics of this habitat especially the abundant marginal vegetation also suggest that it would support a rich diversity and abundance of aquatic insect fauna belonging to several different orders.

In the upper sections of the study site the most common freshwater fish species expected to occur are tilapia (*Oreochromis mossambicus*) and catfish (*Clarias gariepinus*). However, tidal influence is expected to reach the study area especially at spring highs and estuarine fish may thus occur within the habitat.

(c) Umgeni Estuary – Downstream of the Project Site

Apart from a slight increase of the floodline during major flood events the Estuary will not be directly affected by the Umgeni Project. The CSIR however advises that potential impacts from the proposed project, if correct mitigation measures are not executed, can nonetheless extend into the estuary and thus effect the estuarine habitat and fish populations.

Flora

Apart from the patches of reeds and disturbed secondary habitats in terms of embankment vegetation, the most important habitat feature within the estuary that requires protection is the Beachwood Mangroves.

Fauna

The Umgeni estuary has a typical estuarine fish fauna and the system is functional as a nursery area for marine spawned fish species.

Fish species were previously recorded in the estuarine system based on very limited fieldwork (CSIR unpublished data; Harrison et al., 2000; Begg 1984) and should be regarded as incomplete. Harrison et al (2000) considered the ichthyofauna to be in a moderate condition. In prioritising South African estuaries based on their potential importance to estuarine associated fish species, Maree et al (2000) regarded the importance of the estuary as the 34th of 248 systems assessed. Several species are important in recreational (estuarine and marine environments) and commercial fisheries (in marine environments). Several rare and endangered fish species, including sleepy goby *Glossogobius biocellatus* and checked goby *Redigobius dewaali*, are also expected to occur in the system although these have not been recorded in the limited surveys undertaken to date.

5.3 Human Environment

5.3.1 Land use and Ownership

Predominant land uses of the affected site and surrounding areas include light industrial, residential, road and rail transport network servitudes and recreation. **Figure 2** indicates the various property owners and land uses.

eThekwini Municipality owns numerous portions of the land that will be directly affected, which includes the river reserve, stream and services servitudes and others. Some private business established on the affected embankment, are leasing properties from eThekwini, whilst others are privately owned.

The following private organisations have been identified to be directly impacted by the modifications to the river embankment:

- eThekwini Islamic Society graveyard
- The Mills – formerly Mondi Paper Mill

- SA Rail Commuter Corp
- Mantell Trading 85CC
- DGA Construction CC
- Trustees of YGM Haffajee Trust
- New Era Motor Spares

Further details of the property owners whose properties are directly affected by the Umgeni Project are provided in **Appendix M** of this report.

As already mentioned in **Section 2.2** the second phase of the Umgeni canalisation was delayed due to restrictions on acquisition of properties. eThekwini Real Estate Division will however acquire the affected properties through normal council acquisition procedures. This effort will be supported by a letter from the MEC of Local Government and Traditional Affairs (dated 19 July 2005) which grants eThekwini Real Estate Department permission to proceed with the expropriation of land and/or servitude rights to allow the Umgeni River Project. This letter is attached in **Appendix N**.

From the photo record included in **Appendix B** it appears as if some of the platforms on which business premises have been established have been extended into the river reserve through backfilling. This encroachment into the river path aggravates the risk of flood damage to the developments on the embankments and upstream flood plains.

Surrounding businesses will potentially be affected by construction activities.

eThekwini indicated that it is unlikely that they would require access through the premises of these businesses as Road House Crescent Road and thoroughfares through eThekwini properties will be used to access the Umgeni Project site during construction.

5.3.2 Socio Economic Features

The most prominent Socio-Economic feature is the Umgeni Business Park, which contributes significantly to generating revenue and providing jobs within the eThekwini area. The large portion of the Umgeni Business Park and beyond is at risk of being significantly affected by floodwaters, as was confirmed during the 1987 floods (refer to **Section 2.3** for further detail). The proposed widening will thus provide an essential and strategic flood protection measure for the properties and developments located within the floodplains of the river.

At least one of the business owners, on properties that are directly affected by the Umgeni Project, stated that the Umgeni Project would heavily impact their business unless they manage to successfully relocate.

The Umgeni Project site is in close proximity to the residential developments of Seacow Lake and the Umgeni Park and is overlooked by the higher lying residential developments of Morningside on the opposite side of the Umgeni River.

5.3.3 Traffic and Infrastructure

The site is located in an area that can be regarded as a major traffic node, linking northern and central eThekweni via rail and road.

Major roads that form part of this node are North Coast Road; Riverside, Peter Close and Inanda Road (M21, north of the River) and Umgeni (M19, south of the River). Connaught Bridge provides for a river crossing to North Coast Road. Traffic congestion on these roads are common during peak hour.

The rail crossing links the Durban Central Business District to the Durban North area.

An 132kV overhead transmission line crosses the Umgeni River at the affected site. An associated tower is located on the embankment just outside the affected site.

5.3.4 Recreation and Tourism

The Umgeni Estuary is located downstream of the Umgeni Project site. The estuary and surrounding areas have been developed to provide for a variety of recreational opportunities for leisure and sport, such as, angling, walking, jogging, cycling, golfing, bird-watching, canoeing and rowing.

The recreational features include the following:

- The estuary itself
- Windsor Park, a recreational park with lawns, walkways, food outlets, games facilities, sports ground and golf course
- Umgeni River Nature Trail
- Umgeni Bird Park

5.3.5 Cultural and Heritage Environment

Mr Gavin Anderson, the Amafa accredited Archaeologist, confirmed during his preliminary heritage impact assessment that there are no known social or cultural features of heritage value within the proximity of the site, which could potentially be affected by the Umgeni Project. This is with the exception of the graveyard owned by the Islamic Society, which borders the directly affected properties to the east.

Mr Anderson advised that the lack of heritage features is a result of urbanisation, infilling of sections of the embankment, as well as previous severe flood impact of the Umgeni Project site. Although unlikely, unknown features or artefacts of heritage value may however be exposed during excavation and should thus be appropriately dealt with in environmental planning for construction activities.

eThekweni liaised with the Islamic Society, during a meeting held on 14 April 2005, on various project alternatives as part of their planning process. The society advised that the Islamic Community considers direct human impact on existing graves as a very sensitive issue. As discussed in more detail in **Section 9**, eThekweni was able to

select a suitable alternative alignment for the embankment modifications, which has no direct impact on the graves.

Mr Dave Hall from Spoornet advised that remains of historical Spoornet wagons and carriages were uncovered during the construction excavations for Phase 1 of Umgeni River Canalisation. It is unknown whether similar artefacts exist at the proposed site.

5.4 Environmental Quality

5.4.1 Air Quality and Noise Environment

The air quality in the area is generally poor due to the impacts of urbanisation. Air pollution results from smoke and odours emitted from traffic and industrial activities.

Background noise in the area surrounding the Umgeni Project site is generally relatively high due to industrial activities as well as rail and road traffic.

5.4.2 Visual and Aesthetic Features

The predominant characteristic of the area surrounding the Umgeni Project Site is typical of an urbanised, industrial and business environment, within which the river itself is a dominant natural feature. Major roads, railway lines and bridges traverse the landscape.

The riparian vegetation along the Umgeni River and small patches of natural vegetation boost the aesthetics of the natural environment. Aesthetics could however be improved if alien invasive plants are controlled and if poor management of current embankment structures are eliminated. With appropriate care and attention to landscaping features during the detail design, the Umgeni Project could thus contribute to a visual improvement.

6 PROJECT ACTIVITIES AFFECTING THE ENVIRONMENT

6.1 Introduction

The activities that are associated with the construction, maintenance and operation of the proposed widening of the Umgeni River that could potentially have an impact on the environment are listed in the sections below.

6.2 Construction Phase

The construction activities that could have an impact on the environment have been identified as the following:

- Use of available roads and thoroughfares for construction site access
- Use of noisy equipment and construction vehicles
- Introduction of construction labourers
- Clearing of pathways to construction sites where no access roads or tracks are available
- Increased traffic during construction
- Setting up of camp sites which could potentially include temporary accommodation and amenities and the activities related to it
- Introduction and storage of construction material such as concrete, brick, fuel, oils, gabion structures, construction wastes and litter
- Use of hazardous substances could potentially give rise to soil, groundwater and surface water contamination
- Replacement of affected services infrastructure such as for water, wastewater and electricity
- Demolition of existing buildings on affected site
- Demolition and excavation of existing man made structure on embankments, such as buildings and hardstanding
- Excavation of debris and sand from the existing embankment
- Construction of stormwater conduits
- Construction of gabion structures
- Storage of construction material rubble and other waste
- Disposal of waste and debris
- Vegetation of gabion structure and other exposed parts of the embankment

6.3 Use and Maintenance Phase

Once construction has been completed, activities for the proposed development will be restricted to the following:

- Occasional maintenance of the gabion flood protection structures and stormwater conduits
- Inspections and maintenance of the embankment to ensure adequate vegetation until this has been established
- Control of alien vegetation on the embankments

7 ISSUES AND CONCERNS OF INTERESTED AND AFFECTED PARTIES

This section summarises key issues and concerns raised by the IAPs during the PPP that was followed during the Scoping Study for the Umgeni Project. (See **Section 3** for the details on the approach followed during the process for the latter.)

Overall approximately 100, which included, various authoritative stakeholders, members from the Umgeni Business Park local residents and affected property owners were involved in the PPP.

All the concerns and issues raised during the PPP including proposed alternatives are discussed in the section below. Comments and clarification on the issues raised are provided in **bold** format. Copies of all formal correspondence received from the IAPs are included in **Appendix H**.

7.1 Issues Raised by Environmental Authorities

7.1.1 Ezemvelo KwaZulu-Natal Wildlife (Ezemvelo)

ARCUS GIBB emailed a BID to Ezemvelo on 13 June 2005 regarding the proposed development. Upon receipt of this document Ezemvelo requested to be registered on the project IAP database. In subsequent correspondence ARCUS GIBB followed up with Ezemvelo to enquire on whether they would like to raise any issues or concerns. Ezemvelo responded in an e-mail dated 24 June 2005 in which they indicated that they are unable to provide comment within the requested timeframes, due to current resource constraints and limited staff compliment and thus requested more time to comment on the proposed project. (Refer to **Appendix D** for more information.)

ARCUS GIBB will include any comments received from Ezemvelo into the FSR or forward them to DAEA as soon as they receive these.

7.1.2 Heritage KwaZulu-Natal (Amafa)

Amafa confirmed in a fax dated 20 June 2005, that they have no objection to the Umgeni Project. They however advised that they require sensitivity to the possible findings of archaeological objects. Should any heritage objects or resources of potential heritage significance be identified during construction excavations, Amafa must be notified and all development must be discontinued until further notice. (Refer to **Appendix D** for more information.)

As already mentioned, Mr Gavin Anderson, an Amafa-accredited Archaeologist, visited the site on 25 April 2005. Without resorting to trial excavations, he established that no features of significant heritage value were observed at the site. This is apart from the Islamic Graveyard, which will not be directly impacted due to eThekweni selecting an alternative alignment for the proposed new embankment, which specifically avoids such impact. eThekweni advised

that, due to the request for avoidance of direct impact, the section of the River where the graveyard is situated will thus not be provided with flood protection and the graveyard will continue to be prone to flooding during heavy storm events, like it has been in the past (Refer to Appendix K for the Heritage Impact Assessment report).

eThekwini must instruct the contractors (e.g. through and Environmental Management Plan) to refrain from impacting the graveyard in any way. Contractors must also contact the Resident Engineer (RE) or Environmental Control Officer (ECO) if any features of potential heritage value are uncovered during construction activities. The RE or ECO must notify Amafa for them to investigate such features.

7.2 Issues Raised during the Stakeholder Meeting

The IAPs commented and raised the following issues and concerns related to the proposed development, during the Stakeholder meeting held on the 14 June 2005:

7.2.1 DWAF

Mr Pat Reddy, Assistant Director at the DWAF Regional Office, raised the following issues and concerns:

- eThekwini must submit a formal permit applications to DWAF for the modifications to the Umgeni River embankment in compliance with legislative requirements

eThekwini has completed and will submit the relevant applications forms and has contacted DWAF to further clarify and outline further requirements for the proposed development. See email dated 14 June 2005 for more detail.

- Mr Reddy advised that eThekwini must submit detail design and reports detailing how potential significant environmental impacts by the project activities such as erosion and siltation and any other impacts of ecological significance will be controlled as required by the National Water Act.

The DSR will be issued as an attachment to the permit application. The potential environmental impacts and the proposed mitigation measures related to Umgeni Project are outlined in Section 8 of this Scoping Study. eThekwini has appointed ARCUS GIBB to compile an EMP for the construction phase of the Umgeni Project. This EMP will cover the requirements for environmental mitigation and compliance during construction. eThekwini will further submit the detail design to DWAF to meet their requirements.

- eThekwini must take any existing water service infrastructure into consideration during the planning and design for the Umgeni Project.

eThekwini has conducted a survey of the affected site and are aware that there are sewer and water mains that pass through the affected site.

eThekwini have made provision for the relocation of these services in the planning and design for Umgeni Project.

- Pollution and siltation is an issue of concern and DWAF would therefore like to review the procedures that will be implemented to manage these aspects during construction (This issue was also previously raised by Mr Gravel-Blondin, Deputy Director: Water Quality Management, during personal communication)

Mr Randeer Kasserchun, eThekwini Deputy Head, advises in his e-mail dated 4 August 2005 that no construction activities whatsoever will take place within the flow area of the river. Therefore the Umgeni Project will have no impact on the flow and siltation aspect of the river. eThekwini adopts this approach for three reasons:

- 1. To avoid any impact on siltation and thus downstream estuarine ecology.***
- 2. Ease of construction, i.e. the contractor will not be working within the existing watercourse.***
- 3. No river diversion works will be required.***

The issue of additional water pollution during construction will be addressed in the EMP.

7.2.2 Spoornet

Mr David Hall, a representative of Spoornet raised the following issues and concerns:

- The wrecks of historic rail carriages were uncovered during construction works on the southern embankment during Phase 1 of Umgeni River canalisation. There might thus be a potential for similar findings on the northern embankment. Any such findings may potentially be of heritage value and as such may be under protection of Amafa through the National and KwaZulu-Natal Heritage Acts.

During the archaeological site inspection Mr Gavin Anderson did not observe any feature that would indicate that such wrecks exist at the site. No trial excavations were however undertaken during this site inspection and the potential for hidden artefacts or features of heritage value thus remain. ARCUS GIBB has thus noted the concern and will include relevant heritage requirements in the EMP. This includes the requirement for eThekwini's appointed contractor to immediately notify the Resident Engineer and ECO if any discovery of features or artefacts of potential heritage value are made. Amafa has also advised that they be notified if any features of potential heritage value are uncovered during construction activities (refer to Section 7.1.2 above).

7.2.3 Umgeni Water

Mr Shabeer Khan, a Water and Environmental Scientist representing Umgeni Water, raised the following issue:

- The river flow should be controlled at all times during the construction phase of the Umgeni River.

The point has been noted and will be included in the EMP as a mitigation measure. eThekwini is aware that flow of water to the lower Umgeni can be regulated, provided the Umgeni Dam is not operated at full capacity and no major flood occurs during the construction phase. eThekwini is to enter into negotiations with relevant stakeholders for the control of water flow from the dams during the construction phase.

7.2.4 eThekwini Water and Sanitation

Mr Ian Duncum, an area Project Engineer representing eThekwini Water and Sanitation, raised the following issue:

- A sewer pipe of approximately 450 mm, which exists within the affected site, will require relocation as part of the Umgeni Project and must therefore be covered in the EIA application for the Umgeni Project.

The Umgeni Project provides for the relocation of the affected sewer, water and stormwater services within the 'new' embankment design and is thus included in the project description of this Scoping Study and EIA application. eThekwini has advised that they will also undertake a further detailed survey to identify any unknown services before commencing with construction excavations.

7.2.5 eThekwini Councillors

Mr John Steenhuisen, an eThekwini Councillor, representing local residents raised the following issue:

- Enquired whether the Inanda dam could be used to provide for adequate flood protection for downstream areas.

eThekwini advised that the Inanda Dam provides flood protection to downstream areas to a certain extent, but as soon as the dam is operated close to its maximum capacity, all such protection fall away. It is for this reason that local flood protection is required. This was confirmed during a flood risk assessment study, which SRK (Pty) Ltd undertook in 2000 on behalf of eThekwini. This study specifically covered flood risk associated with the Umgeni River between the Inanda Dam and the river mouth. According to the report the operating level of the Inanda Dam has a significant attenuation impact on floods less than 10-year events if the dam is maintained at less than approximately 60% of full supply capacity, whilst for more extreme events this attenuation diminishes totally. eThekwini has again commissioned SRK in 2005 to conduct a detailed assessment for the 1:50 and 1:100 year floodlines in relation to a number of alternative scenarios to the Umgeni Project . (Refer to Section 2.3.2 and Section 9.3 for further detail) Copies of these flood risk studies can be viewed at the at eThekwini offices on request.

7.2.6 Islamic Society

Mr William Khan, representing the Islamic Society, complimented eThekwini for consulting them and taking the sensitivity of the existing Islamic graveyard into consideration during the selection process of suitable design alternatives

It is to be noted that, amongst other liaison, eThekwini met with representatives from the Islamic Society to discuss issues, mitigation and project alternatives associated with the Islamic graveyard.

7.2.7 Durban Solid Waste

Mr John Parkin, a representative of Durban Solid Waste, raised the following issue of concern:

- Concerned that the Umgeni Project could potentially affect or impact Durban Solid Waste's Garden Refuse Station, which is located on the eastern side of the site.

eThekwini advised that the preferred alternative alignment does not directly affect the Garden Refuse Station. eThekwini will however negotiate with Durban Solid Waste should they require access to the station site or plan to impact on it during construction.

7.3 Issues Raised during the Information Sharing Meeting

The IAPs commented and raised the following issues and concerns related to the proposed development, during the Public Information Sharing meeting held on 21 June 2005:

7.3.1 Mantella Trading CC

Mr Dion Kuter, a member of Mantella Trading CC, is concerned that his organisation will be affected by the widening and has thus raised the following issues:

- Requested more details on the proposed embankment alignment and enquired whether eThekwini has undertaken any survey to base their proposed alignment on:

eThekwini displayed their preliminary embankment design plans at the ISM and reported that these are based on a survey that their department had undertaken in the nineties. A further survey will however be conducted in the next few months, which will be used for the detail design. eThekwini advised that more detailed information is available at eThekwini offices for viewing.

- Concerned that the project is a foregone decision and the other alternatives have not been adequately considered, for example, dredging and deepening of the relevant river section.

eThekwini advised that various project alternatives were considered in 1992 when the planning phase for the Umgeni Project was initiated. These alternatives included the deepening and the dredging of the river. Deepening through dredging would however require regular and expensive maintenance, as silt travels down the river and settles in the river bed continuously. Dredging also has the potential to cause periodic significant disturbance to in-stream biota and heavy siltation of the water with potential significant implications to the downstream estuarine system. Mr Gravelet Blondin from DWAF, in a telephone conversation on 13 July 2005, stressed that eThekwini must avoid any form of dredging during the Umgeni Project to avoid significant negative impact on water quality as was experienced during the first phase of Umgeni River Canalisation.

- Enquired whether the Inanda dam could be used to provide for adequate flood protection for downstream areas.

Refer to comments on similar issue raised in Section 7.2.5.

7.3.2 MOTIFPROPS (PTY) LTD

Mr David Henry, a Director representing Motifprops (Pty) Ltd and member of WESSA highlighted the following concerns:

- The potential for certain areas in Springfield Flats to provide for flood attenuation should be considered.

eThekwini advised that not sufficient open floodplain areas are available in Springfield Flats to provide for adequate flood attenuation, as was proved by the number of flooding incidents that occurred in the Umgeni Park area.

- Concerned that more and more sewage is being pumped and transferred into the Umgeni River and that this would have a detrimental ecological impact on the river environment

The point has been noted. Disposal and transfer of treated sewage wastewater is dealt with in other projects, which are not associated with the Umgeni Project covered in this Scoping Study.

During high flood events water flowrate increases orders of magnitude over the normal flow rate. As a result additional flow through the proposed treated sewage transfer schemes have no significant affect on floodlines and therefor no relevance to this flood attenuation project

- Concerned that the proposed development may encourage growth of alien vegetation

Significant amounts of alien vegetation already exists within the section of the Umgeni River embankment that will be affected by the Umgeni Project, as was confirmed by the CSIR Biodiversity Impact Assessment. Mitigation measures to ensure appropriate re-vegetation of the 'new' embankment and control of alien vegetation during and after construction will however be included in the EMP.

7.3.3 NCP Alcohol

Mr Malcolm Krishenlall representing NCP Alcohol raised the following issues:

- Concerned that the proposed widening may affect NCPs 24-hour operation should water and sewer mains that service NCP be affected.

The relocation of sewer and water mains has been incorporated in the detail design of the proposed development. eThekwini plans to first construct and commission the 'relocated' services infrastructure before effecting a quick switchover from the existing mains. eThekwini thus only envisages a very short interruption of services during the switchover and will notify affected users of their intentions to do so ahead of time.

- Concerned that access roads to the site may be too narrow and thus enquired as to which roads will be used during the construction period

eThekwini advised that they have planned to use existing public roads such as Road House Crescent Road and other thoroughfare routes on eThekwini embankment properties as access routes during construction. eThekwini does not envisage requiring access through private properties, but if this is later needed this will be by negotiations with the relevant owners.

7.3.4 Mantella trading 85CC

Mr Dion Kuter, a representative of Mantella Trading raised the following issues:

- Mr Kuter expressed his concern and enquired whether the preliminary design for the proposed alignment may have been based on outdated floodline studies that were done prior to the construction of the Inanda Dam.

eThekwini advises that the proposed alignment was based on results of the Steffen, Robertson and Kirsten report dated June 2000 with the title "Umgeni River – Inanda Dam to Sea, Flood Risk Assessment Study – Hydrology, Report No 274632/". For further verification SRK Consulting Engineers and Scientists was appointed to assess various alternatives for the proposed alignment which is outlined in a report titled "Umgeni Canal Assessment, SIMM/coxj/0507052" which was issued to eThekwini in July 2005. The latter report verifies the efficiency of the proposed alignment in flood attenuation.

7.3.5 Others

- The question was raised as to who would benefit from the Umgeni Project.

As described in Section 3.2 businesses located in or associated with the Umgeni Business Park will benefit from the Umgeni Project as the risk of flood impact will be significantly reduced. eThekwini advised that the Umgeni Project will not provide complete protection from flooding to some low-lying properties as ingress from floodwaters through backfilling cannot be altogether prevented.

7.4 Issues Raised during the BID distribution and following the Information Sharing Meeting

7.4.1 New Era Motor Spares

Ms Nirri Singh, a property owner of New Era Motor Spares and local resident for the past five years, raised the following issues in a meeting held at ARCUS GIBB Offices, on 22 June 2004.

- Enquired why eThekwini is widening the northern embankment instead of the southern embankment, where less established properties would be affected.

The 1st phase of the widening of Umgeni River already involved the southern embankment. Due to the limited space available at the southern embankment additional widening is required at the northern embankment to provide for adequate flood attenuation.

- Concerned about the impact that relocating her business to another premises elsewhere will have on her business. Ms Singh explained that eThekwini has terminated her property lease agreement with the result that she would need to relocate her business. She advised that relocation of her business might also result in job losses to her labourers

The concern is noted. eThekwini reported that they have well ahead of time informed Ms Singh about their intention to terminate the lease. eThekwini has considered a number of alternative flood attenuation options, but concluded that the proposed embankment alignment would result in the most effective flood protection for the Umgeni Business Park at large.

- Concerned that removal of established business premises from the area in the vicinity of Connaught Bridge will allow vagrants to occupy the area, as they may seek shelter under the bridge. This may potentially result in rise of crime in the area. Ms Singh reported that this had been the case before business premises were established below the bridge.

Noted. eThekwini should investigate the implementation of measures to prevent vagrants occupying the area below the bridge .

- Ms Singh advised that eThekwini Town Planning Department did not permit her to expand her property over sewer and water servitudes, when she moved into the premise in 1999, due to a concern for impact on these mains. She expressed her concern that although these areas were regarded as “no go areas”, they would now be affected by the Umgeni Project.

Relocation of the existing sewer and water mains have been provided for in the planning and design of the Umgeni Project.

7.4.2 eThekwini Solid Waste Management

Durban Solid Waste (DSW) and Cleansing Management, represented by Mr John Parkin raised the following issues (see **Appendix H**):

- Mr Parkin enquired as to how the Umgeni Project would affect the Garden Refuse Station site in Road House Crescent.

Refer to comments on this issue in Section 7.2.7.

- The Umgeni Project may potentially affect the stormwater system at the Garden Refuse Station and Mr Parkin thus advised that eThekweni must ensure that the stormwater outlet for this site is incorporated into the Umgeni Project design.

The point is noted. It is recommended that eThekweni provides for adequate stormwater outlets for the Garden Refuse site in the Umgeni Project design.

8 POTENTIAL ENVIRONMENTAL IMPACTS

8.1 Introduction

The following environmental issues relating to the proposed Umgeni Project have been identified as being important and were investigated in the Scoping Study.

8.2 Assessment of Potential Impacts

ARCUS GIBB has undertaken a preliminary assessment of the impacts of the Umgeni Project on the environment, based on professional experience and has designated low, medium or high significance to the relevant impact. Where possible, mitigating measures have been proposed to reduce the negative impacts.

Impacts with a **low** significance are considered to have no influence on the decision to proceed with the construction of the proposed development. Impact with a **moderate** significance will influence the decision unless it can be effectively mitigated to a low significance. Impact with a **high** significance despite mitigation would influence the decision to proceed with the proposed development.

The assessment findings and proposed mitigation measures are described in the sections below. In this scoping report, mitigation measures will refer to the precautionary measures designed to avoid, reduce or remedy the impacts of activities from the proposed project.

8.3 Biophysical Impacts

8.3.1 Topography and Drainage

The modifications to the northern embankment of the Umgeni River will impact the local topography of a very small area. As the area is already heavily impacted by urbanisation the impact on topography is considered to be of **low significance** without further mitigation.

The Umgeni Project is motivated by the need for flood attenuation and will certainly therefore impact on drainage aspects of the lower Umgeni River system. Widening of the 1km section of the Umgeni River will significantly reduce the 'bottle neck' and thus upstream flood levels during major flood events. This will allow for releasing a greater flowrate through the affected section of the river during major floods and thus reduce the risk of flooding of the Umgeni Business Park. Certain lower lying properties adjacent to the project site might still experience ingress of floodwater during major floods, but the risk of flood damage will probably also be reduced due to the protection provided by the flood protection works of the embankment.

In terms of flood attenuation the project will thus have an **overall positive** impact for the area upstream of the proposed site, which can be considered to be of **high significance**.

Floodline studies as described in **Section 2.3.2** indicate that the Umgeni Project would result in only a slight increase of flood levels in the Umgeni Estuary downstream of the proposed site between Connaught Bridge and Athlone Bridges during major flood events.

The impact on flood levels in the downstream Umgeni Estuary can thus be considered as of **low significance**, without further mitigation measures.

The Umgeni Project does not constitute a river diversion and will have no impact on drainage of the river apart from during major flood events.

DWAF advised during the Stakeholder Meeting that although the Umgeni Project is not regarded as a river diversion, eThekweni would need to formally apply for authorisation of the proposed modifications to the embankment.

It is to be noted that officials from the regional DWAF, who have been included in the public participation process, indicated that they have no objections to the Umgeni Project. These officials however advised that the final decision on granting permission for the Umgeni Project rest fully with the National Department of Water Affairs in Pretoria.

eThekweni has submitted the relevant permit applications to DWAF, which includes this Scoping Report as an attachment.

8.3.2 Geology and Soils

The geological impacts will consist of excavation of soil and sand from the affected embankment to provide for the widening. There will be no impact on any geological structures below the alluvium.

The proposed flood protection works on the northern embankment will prevent localised erosion of the embankment section, provided these are appropriately designed, implemented and maintained. In addition and according to the HKS (1987), the Umgeni Project will substantially reduce the erosion depth of the riverbed in the vicinity of Connaught Bridge during major floods.

In terms of erosion protection for the affected river section the project will thus have an **overall positive** impact on the proposed site, which can be considered as of **moderate significance**.

During construction, clearance of vegetation and hardstanding, excavation and earth grading may expose fairly large areas of soil and sand that will be prone to erosion if left unprotected during heavy rains. Erosion may result in sedimentation and siltation of the Umgeni Estuary with associated impacts as described in more detail in **Section 8.3.3** and **Section 8.3.4** below.

Contractors may need to clear vegetation on access tracks and traffic on such tracks could also destroy vegetative cover, which could potentially result in erosion of these tracks.

The impact of the project activities that may lead to erosion, siltation and sedimentation is considered to be of **high significance without mitigation**.

Implementing appropriate mitigation measures during construction as well as post construction rehabilitation can however reduce the impact. Typical mitigation and rehabilitation measures include the following:

- A detail geological investigation is required prior to detailed design and construction to provide further information on water table, extend and composition of fill, potential methane gas emissions from refuse, settlement on canal berms and stability of canal linings. The results of the investigation must be submitted to the eThekweni Geotechnical Engineering Department.
- If at all possible, construction should occur during the dry season when risk of heavy rains are low
- Entering into negotiations with relevant stakeholders for the control of water flow from the upstream dams during the construction phase. In doing so the functionality of the estuary must however not be compromised.
- No construction activities must be allowed within the normal 'non-flood' river channel and inner bank of the Umgeni River that could result in any disturbance thereof

(Mr Randeer Kasserchun, eThekweni Deputy Head, has confirmed that construction will be restricted to the outer portion of the embankment section.)

- Removal of sediment between the foot of the newly constructed bank and the present outer bank up to a level of not higher than 0.5 metres above the outer edge and the present inner bank
- Grading of the site is required after construction to ensure free flow of runoff and to prevent ponding of water
- During the construction phase clearance of vegetation should be appropriately minimised and delayed to minimise exposed areas that might be prone to erosion during heavy rains
- Implement measures to protect the construction site from erosion by stormwater
- Implement measures to effectively contain and allow settling prior to its discharge of any stormwater arising at the construction site, which could potentially be laden with sand and silt
- Construction of anti-erosion berms on access tracks
- Ensuring that stockpiles are well managed to minimise erosion thereof
- Ripping of compacted soil to promote re-vegetation of tracks and other areas surrounding the gabion structure that have been compacted
- Appropriate grassing and maintenance thereof of gabion structure and the top of the embankment.

The impacts on geology and soils will be reduced to **low significance with mitigation**.

8.3.3 Water Quality

A concern related to the impact on water quality was raised during the Stakeholder meeting. Care should be taken to ensure that mitigation measures, as described in **Section 8.3.2**, are implemented to manage erosion and associated sedimentation during construction to avoid significant impact on the Umgeni Estuary water quality.

Large amounts of suspended silt from the excavation activities could potentially wash into the river, which could have a negative impact on water turbidity and fauna life (e.g. blocking out the sun, siltation, suffocation). It might also impact on the appearance of the water, which could in turn impact on aesthetics and therefore recreational use and tourism.

Apart from turbidity caused by siltation, water quality could potentially be impacted by spillage of hazardous substances and spillage from latrines.

Although no evidence of any spills or dumps of hazardous material were observed during site inspections, there is a potential for uncovering hazardous waste and contaminated soil during excavation activities, due to the current and historic industrial activities at the site. In addition any hazardous substances (e.g. fuel, paints and oils) used during construction could potentially result in water contamination unless good management practices are adhered to.

If poorly maintained temporary latrines could potentially spill into soil and water resources.

The potential impact on water quality is considered to be of **moderate significance without mitigation**.

Typical measures should include the following:

- Avoiding impacts on the river
- Implementation of mitigation and rehabilitation measures as described **Section 8.3.2** to manage erosion and sedimentation
- Ensuring good management practices are implemented concerning use and disposal of any hazardous substances, which includes e.g. the following:
 - Determining the extend and composition of existing fill and refuse deposits
 - Ensuring excavation and safe disposal to an appropriate landfill site of any uncovered hazardous substances or contaminated soil, that may have resulted from adjacent industrial activity
 - Ensuring that no waste is stored at the construction site for longer than 90 days, unless eThekweni has obtained an exemption from DWAF for the issuing of a waste disposal permit in terms of Section 20 of the Environment Conservation Act.
 - Carrying out routine vehicle maintenance and washing at a maintenance workshop instead of at the construction site or camps
 - Utilisation of drip trays to prevent oil or fuel spills in case of on-site emergency maintenance

- Minimisation of quantities of fuel, paints and other hazardous material kept at the construction site
 - Safeguarding of hazardous substances from being stolen, vandalised, catching fire or spilling on open ground
 - Provision of bunding for bulk fuel, oil and any other hazardous liquid temporary storage facility in accordance with relevant legislation
 - Introduction of appropriate waste and sewage collection and disposal procedures and facilities during construction
- Controlling drainage to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to properties further down from the site
 - Erection of any temporary latrines at least 50 m outside the 'moderate storm' flood line
 - Regular emptying and appropriate disposal of latrine content
 - Monitoring of suspended solids in the watercourse just downstream of the affected site on a frequent basis, to detect any impact caused by the proposed activities. The results of such monitoring must be submitted to DWAF office.

The impacts on the water quality will be reduced to a **low significance with mitigation.**

8.3.4 Ecological Systems

Although the Umgeni Project site is within an urbanised area it has the potential to impact on important surrounding ecological systems.

The CSIR advised in their Preliminary Biodiversity Assessment Report that in general the loss of terrestrial species (including hygrophilous species on the inner banks) due to actual disturbance and bank reconfiguration is not considered to be of significance due to the following:

- The directly affected habitats are essentially disturbed secondary habitats and in terms of the vegetation consist of many opportunistic alien species
- From this preliminary survey this habitat is not expected to contain any rare or endangered species
- The relatively small affected area is very similar in habitat to areas above and below this section and species composition (terrestrial and aquatic) are thus expected to be similar

In addition, the more mobile members of the faunal communities are likely to move out of the area into surrounding habitats once the activities and noise associated with construction becomes evident.

In terms of loss of habitat and biodiversity of the affected site the impact on the ecology is considered to be of **low significance without mitigation.**

The construction activities however, are of greater concern in terms of potential impacts on the aquatic environments within and downstream of the project site, most notably the Umgeni Estuary and associated Beachwood Mangrove. Unless appropriate measures, as described in **Section 8.3.2**, are introduced large amounts of sediment could potentially be delivered to the aquatic environment during the construction phase, especially if it occurs during the rainy months. This has the potential to have the following impacts on ecological systems:

- Reduced primary (algal) productivity due to compromised light penetration – which could result from increased turbidity
- The clogging of gills of fish and feeding structures of planktonic filter feeders from increased turbidity
- Decrease in visibility can affect feeding (prey capture) of fish, predatory invertebrates and zooplankton
- Settling of sediment can result in the smothering of benthic communities and aerial roots of the mangroves. Such sediment deposition is likely to occur when flow rates reduce in the wider estuarine area. These benthic communities are an integral part of the food web in estuarine ecosystems

Litter, waste and spillage of hazardous substances arising during construction could potentially be introduced into the environment, which could impact on the ecological soundness of the area. Of particular concern would be soil and water contamination that could result from poor management of use or disposal of hazardous substances such as fuel, paints and oil.

The impacts of the project activities on ecological systems are considered to be of **moderate to high significance without mitigation**.

Good environmental management practices must be followed to prevent potential contamination of soil and water resources and to minimise impact on biodiversity. Typical mitigation measures should include the following:

- Implementation of mitigation and rehabilitation measures as described **Section 8.3.2** and **Section 8.3.3** to manage erosion, sedimentation and prevent hazardous substances pollution during construction
- Minimisation of the construction footprint to the affected river section
- Prevention of construction litter
- Rehabilitation of areas where soils have been compacted, once construction has been completed
- Natural regeneration of grass is to be encouraged by reinstating the topsoil originally scraped from the area
- Appropriate transportation and disposal of any cleared alien vegetation to an appropriate garden refuse facility to prevent the spread of seeds
- Controlling of alien vegetation after the vegetation clearance
- Prevention of runaway fires by introducing the following measures:
 - Keeping vegetation short in working areas

- Ensuring that lighting of fires on windy days are prohibited
- Ensuring that adequate fire fighting equipment are available at the construction site
- Ensuring that emergency services contact numbers are available at construction sites
- Keeping firebreaks clear around construction site
- Planting of indigenous trees to enhance landscaping features and to provide for suitable feeding, roosting and nesting for indigenous birds (e.g. fish eagle) - no alien invasive trees may be used
- Prevention of construction and maintenance personnel from setting snares to capture animals.

The impacts on the ecology will be reduced to a **low significance with mitigation**.

8.4 Impacts on Human Environment

8.4.1 Economic Impacts

The Umgeni Business Park, an extensive light industrial and business area, which is located in the Umgeni River flood plains known as Springfield Flats, is at risk of being significantly affected by floodwaters. This was proven when the floods of 1987, the most recent major flood event, caused large portions of the park to be flooded.

The Umgeni Business Park contributes significantly to the business and light industrial economy of the eThekweni Municipal area with associated benefits such as proximity to the central business centre and local job creation.

The Umgeni Project provides for flood protection or attenuation for the properties and infrastructure located within the Umgeni Business Park. The proposed project is thus of strategic importance, as without such protection business developments would continue to be vulnerable to floodwaters, which could potentially result in extensive economic losses.

The project will thus have an **overall positive** impact on the economic viability of the areas that benefit from the flood protection, which can be considered as of **high significance**.

The Umgeni Project site encroaches on or encompasses a total of ten business premises on the affected embankment section. A number of the affected business and property owners have suggested and raised concerns during the PPP that their businesses may incur losses due to the loss of property and/or need to re-organise or relocate. One organisation reported that, in its case, the negative impact on their business might result in job losses within their organisation.

Without proper planning and care, certain construction activities could also have a negative impact on neighbouring and surrounding business and industrial sites and economic activities. These could potentially include impacts such as damage to

property or services that supply the businesses, requiring access through properties, restricting access to sites, construction traffic, dust, fume and noise generation.

The impact on the affected property and business owner is considered being of **high significance without mitigation**.

Typical mitigation measures should include the following:

- Affected property owners should be compensated at a market related costs
- Avoiding damage to neighbouring properties or service infrastructure that supplies these
- Careful planning and negotiations with property and business owners on any direct unavoidable impact or inconvenience, such as interruption of services and temporary blockage or traffic congestion of their access roads ahead of time, wherever possible
- Ensuring that no fires are lit close to neighbouring properties and prevention of runaway fires
- Provision of adequate stormwater outlets for the Garden Refuse site in the Umgeni Project design
- Apply dust, fume and noise mitigation measures as described in **Sections 8.4.9** and **Sections 8.4.10**
- Making use of local organisations and labourers wherever possible.

The adverse impacts on economic activities of affected and neighbouring properties will be reduced to a **moderate to low significance with mitigation**.

8.4.2 Impact on Land Use

According to the eThekweni Planning Department, the Umgeni Project site is zoned for *Industrial Development* apart from the section that already forms part of the river servitude. The Umgeni Project will bring into affect a permanent change in land use for the sections currently zoned for industrial development, as these will then become part of the river servitude.

The loss of industrial land at the affected site is insignificant in comparison to the protection of land use affected through the flood attenuation for the Umgeni Business Park at large.

In addition to this, industrial development at the affected site is already constrained by the high risk of flood impact, which the 1987 flood clearly demonstrated.

Furthermore, although areas zoned for industrial development in eThekweni is limited, a number of new large industrial parks are being developed in northern eThekweni, e.g. at Avoca/Effingham, which would probably compensate for the loss of this relatively small portion of industrial land.

Although the impact on the land use will be permanent, the unsuitability of the site for long term industrial use due to the high risk of flood impact and due to the benefit of the project to secure land use at the Umgeni Business Park as well as current

expansion of industrial land, the impact of loss of industrial land is considered to be of **low to moderate significance without mitigation.**

The following typical mitigation measures will further reduce the significance level even:

- Ensuring that land is appropriately rezoned
- eThekweni must follow legal procedures during the land acquisition process and should compensate property owners at market related costs

The impacts on land use will be reduced to **low significance with mitigation.**

8.4.3 Interruption of Services

Construction activities may potentially affect existing services. eThekweni has advised that they will undertake a detailed survey to ensure that all existing services are appropriately identified and mapped to prevent any unplanned impact on such services.

The Umgeni Project will affect a number of existing services infrastructure such as sewer and water mains and stormwater outlets. The interruption of these services was raised as an issue of concern during the PPP. eThekweni advises that the services have been provided for in the project planning and design. eThekweni plans to keep these existing services fully in operation whilst new services infrastructure are being implemented and commissioned. Only once this is complete do they plan a short switch-over from the existing to the new services.

The 132kV overhead transmission line and associated towers will not be directly affected by the Umgeni Project site.

The impact as a result of potential service disruption is therefore considered to be of a **low to moderate significance level without mitigation.**

Typical mitigation measures should include:

- Ensuring that all sewer and water mains, stormwater outlets and any other service infrastructure are adequately incorporated in the engineering designs
- Ensuring that contractors are provided with all the relevant information on existing services, including the survey results and maps
- Avoidance of unplanned damage to any existing services during construction
- Obtaining formal written approval from a professional civil engineer and eThekweni Electricity for any construction activity such as excavations within 20m of the overhead transmission line tower. This is to ensure that the tower foundations are not undermined
- Maintaining a 35m wide servitude for the overhead transmission line i.e. 17.5 m on either side of the centre line. Ground levels within the servitude/ wayleave area may not be changed
- Strictly adhering to safety clearances of the Occupational Health and Safety Act at all times when working in or crossing an overhead transmission line servitude.

This implies that nothing may approach within 3.8 metres of the 132kV conductors, even for assessing the height of conductors

- Notification of affected service users of dates and duration of any planned services interruptions during switch-over
- Ensuring adequate planning for commissioning and switch-over of new services.

The impacts on services will be reduced to **low significance with mitigation**.

8.4.4 Traffic and Traffic Infrastructure Impacts

Contractors will need to make use of local public roads to reach short thoroughfares and access tracks to the site. Construction traffic required for transporting equipment, construction material, building rubble, waste and sand from and to the site could thus potentially have a significant impact on the local public road traffic. This is particularly so due to the site's close proximity to a major traffic node, which is already known to experience significant congestion during peak hours. Construction traffic thus requires carefully planning and management to avoid significant contributions to traffic congestion.

As already mentioned in **Section 8.4.1**, construction traffic may potentially impact on neighbours and neighbouring developments. eThekweni indicated during the ISM that local access roads and thoroughfares located on properties owned by eThekweni Municipality would be used during construction. Although unlikely, eThekweni might require thoroughfares through private properties which will be negotiated should the need arise.

No impact on rail traffic is anticipated.

Without proper care construction activities could potentially cause damage to road and rail infrastructure. Spillage of wet concrete on roads could damage roads and must be prevented. Excavations close to and heavy construction vehicles colliding with rail and road bridge pylons could potentially result in damage to these structures, which must be prevented. eThekweni advised that once implemented the Umgeni Project will not increase the flood risk to the bridges, as these bridges have been effectively designed to withstand flood impact.

The impact of construction activities on traffic and traffic infrastructure is considered to be of **moderate significance without mitigation**. The impact on traffic during the operational phase of the widening will be of **low significance without mitigation**.

Typical mitigation measures include the following:

- Liaison with the eThekweni Traffic and Transportation Department on any envisaged traffic impacts
- Construction staff should be trained to show respect to other road users
- Minimisation of congestion and traffic obstruction e.g. by effective route planning, keeping lanes open and introducing traffic control measures
- Make arrangements with property owners for use of road infrastructure prior to commencement of construction
- Construction vehicle must keep to a low speed limit

- Public vehicles should be given the right of way
- Minimising of construction activities in roads during peak hours
- Avoiding excavations too close to the bridge pylon foundations that could result in these being directly impacted or exposed to flood erosion
- Prevention of collisions of excavation plant and haulage trucks with bridge pylons.

The impacts on local traffic and traffic infrastructure will be reduced to a **low significance with mitigation**.

8.4.5 Recreation and Tourism

eThekwini Umgeni Project Engineers have indicated that, once completed, the Umgeni Project will have no negative impact on the recreational activities of the estuary and surrounding area. This is because there will be no impact on normal flow in the estuary and impact on floodline during major floods will be insignificant.

The provision of a platform for a footpath, which could be used to extend the Umgeni River Nature Trail is considered to be a positive contribution to local recreation, provided suitable landscaping features are provided.

Once implemented the project will thus have an **overall positive** impact on the recreational features of the area, which can be considered as of **moderate significance**.

During construction the only potential significant negative impact is considered to be the potential for impact on water quality (see **Section 8.3.2**) and litter, which could in turn impact on recreational activities within the estuary.

The potential impact on recreation is considered to be of **low significance without mitigation**.

Typical measures should include the following:

- Implementation of mitigation and rehabilitation measures as described **Section 8.3.2** and **Section 8.3.3** to manage erosion, sedimentation and prevent hazardous substances pollution during construction
- Minimisation of the construction footprint to the affected river section
- Prevention construction litter
- Controlling of alien vegetation after the removal of grass
- Covering or partial covering of soil over the gabions to promote the establishment of plant cover, for which indigenous, endemic species should be used
- Planting of indigenous trees on the top of the embankment to enhance the landscape features
- Taking recommendations of eThekwini Urban Design and Landscape Planning Section as per their fax dated 27 October 2005 into consideration.

The impacts on recreation will be reduced to an **even lower significance with mitigation**.

8.4.6 Cultural and Heritage Features

Apart from the Islamic graveyard, no features of significant heritage or cultural value were found during the preliminary heritage impact assessment that could be potentially impacted by the Umgeni Project.

Unknown features or artefacts of heritage value may however be exposed during excavation and should thus be appropriately dealt with in environmental planning for construction activities.

During a meeting with the Islamic Society on 14 April 2005 representatives advised that the Islamic Community considers direct human impact on existing graves as a very sensitive issue. As discussed in more detail in **Section 9**, eThekwini was able to select a suitable alternative alignment for the embankment modifications, which has no direct impact on the graves. eThekwini however advises that this alternative alignment will provide no flood attenuation for the graveyard and it would therefore remain prone to flooding during major flood events as it has been in the past.

The affected site neighbours the Islamic graveyard and as a result without due respect and consideration, construction activities may potentially impact on the graveyard. The graveyard is considered a sensitive area and any such impacts must be avoided.

The impact is regarded as having **a moderate to moderate significance without mitigation**.

Typical mitigation measures are the following:

- Prevention of access to and any impact on the Islamic graveyard by construction activities, e.g. through appropriate fencing off of this sensitive site
- Treating the graveyard and any community activity at the graveyard with due respect
- Immediately stopping excavations and reporting to Amafa any potential cultural or heritage features uncovered during the construction activities
- Appointment of a professional Archaeologist to undertake a formal investigation if Amafa give instructions to do so.

The impacts on features of cultural and heritage value will be reduced to a **low significance with mitigation**

8.4.7 Community Safety

Public members may potentially access the construction site due to its close proximity to a large recreational area and due to its allure to bikers and off-road vehicle drivers. Construction sites are however potentially unsafe for public members to access and use. Steep embankments, excavations and dangerous equipment and plant could result in accidents.

The potential impact is regarded as having a moderate to **moderate to high significance without mitigation**.

Typical mitigation measures are the following:

- Display of danger warning signs and no public access sign at all potential access roads and paths
- Minimise slopes
- Prevention of access to any excavations and steep areas
- Locking or locking away of any dangerous plant, equipment, material or substance when not supervised or in use
- Guarding the site outside working hours.

The impacts on community safety will be reduced to a **low significance with mitigation**

8.4.8 Community Security - Ingress of Squatters, Vagrants and Criminals

An owner of one of the business that occupies a site below the Connaught Bridge, who is also a local resident, expressed concern for the Umgeni Project opening space on the affected site below the bridges for ingress of squatters, vagrants and criminals. As a result security for surrounding residential areas, businesses, recreational users as well as the aesthetics of the area might potentially be negatively impacted should such ingress occur. Current occupation of the area surrounding and below the bridges reduces the risk of such ingress.

For the Umgeni Project to provide for effective flood attenuation, the area below the bridges must be included in the widened section of the river and cleared of any structures that could cause blockage to floodwaters. This might indeed encourage ingress of informal settling and sheltering of people below the bridges.

The impact on relationship is regarded as having a moderate to **moderate to high significance without mitigation**. The following typical measures will reduce the significance level further:

Although it might not be altogether effective without further upliftment of the area, typical mitigation measures to be considered are the following:

- Fencing off and blocking off uncontrolled access to the site
- Ensuring neat landscaping design

- Incorporating the embankment into a formal park area which links to the existing Umgeni Nature Trail and the Bird Park establishment
- Ensuring that the site is regularly and adequately maintained as part of such an park area
- Ensuring regular patrolling and policing of the site.

The impacts on community security will be reduced to a **moderate to low significance with mitigation.**

8.4.9 Community Relationship - Influx of temporary construction workers

It is unavoidable that there will be an influx of temporary construction workers for the entire construction period. This could potentially lead to disputes with local communities and businesses.

This potential impact on relationships is considered to be of **moderate significance without mitigation.**

Typical mitigation measures are the following:

- Using local labourers as much as possible
- Training construction workers to respect the property and needs of the affected communities
- Ensure that adequate lines of communication are implemented to deal with any public grievances.

The impacts on community relationships will be reduced to a **low significance with mitigation.**

8.4.10 Impact on Air Quality

Dust impact on neighbouring business premises and nearby residents could result from exposure of sand and soil due to site clearance, excavation, demolition, cement mixing as well as through construction traffic on unpaved roads.

Other sources of air pollution and odours which could potentially have a local impact would be as a result of construction vehicles and equipment exhaust fumes, poor maintenance of latrines, poor waste management procedures, waste burning, potential runaway fires and poor management of temporary latrines.

Due to the site being located in an urbanised area background air pollution is already fairly high due to road traffic and surrounding industrial activities.

The impact of the construction activities leading to air pollution is regarded as having a **low to moderate significance without mitigation.**

The following typical mitigation measures will reduce the significance level even further:

- Minimisation of the surface area exposed to wind erosion
- Wetting of roads during construction when dust problems arise
- Maintenance of vehicles and other driven machinery in use to ensure that no smoke is emitted from exhausts
- Prevention of burning of cleared vegetation and wastes/refuse
- Planting of grass immediately after construction where soil has been exposed
- Regular emptying and appropriate disposal of latrine content.

The impacts on air quality will be reduced to **low significance with mitigation.**

8.4.11 Noise Impacts

Ambient noise levels are expected to rise during the construction phase of the Umgeni Project. Construction activities that emit noise include vehicle trafficking, generator noise, noise from pressure hammers and winches, construction worker voices etc.

People closest to the construction activities, i.e. at the neighbouring business properties and nearby residential areas, will be most affected by potentially higher noise levels or noise irritations due to these activities. Noise impact will probably be most significant during office hours to businesses and at night time to nearby residents.

Ambient noise levels are however expected to be already relatively high, particularly during daytime due to the site being located at the major traffic node with its busy roads, such as North Coast and Riverside Roads, and the railway line.

The noise impact during construction could thus be considered as of **low to moderate significance without mitigation.**

Typical mitigation measures during the construction phase include the following:

- Restriction of noisy construction activities to daytime
- Negotiation with neighbouring businesses as to the most suitable time for undertaking high noise impact activities, such as breaking up concrete hardstanding with pressure hammers in close proximity of the business sites, prior to commencing with such an activity
- Ensuring that all vehicles and where possible noisy equipment are fitted with silencers that are properly maintained

The impacts on noise levels will be reduced to a **low significance with mitigation.**

8.4.12 Visual/Aesthetic Impacts

Parties most impacted by the visual/aesthetic features of the Umgeni Project area are those residing nearby and overlooking the area, for example Windsor Park and Morningside on the North and Umgeni Park, and motorist travelling along roads overlooking the site.

Once in place, the Umgeni Project site will have an aesthetic/visual impact due to the change from the current disturbed secondary vegetated habitat on the embankment to an engineered vegetated gabion structure.

Whether interested and affected parties would perceive the change as an aesthetically positive or negative impact was not confirmed, as no such issues were raised during the PPP.

With appropriate care and attention to landscaping features during the detail design, the Umgeni Project may however potentially provide for a positive impact on aesthetics. This may be achieved by eliminating poor management of current embankment structures, including appropriate landscaping design features, shielding industrial sites by planting of suitable trees on top of the embankment and removal and control of alien invasive plants within the river bed.

Visual and aesthetic impacts will also result from the construction activities such as excavation, stockpiling of construction material, waste and rubble handling of materials. Poor planning and management of the construction site, camp and activities may potentially result in such impact to be negative. Negative impacts may potentially include litter, inappropriate keeping and disposal of rubble and waste and untidy keeping of construction material and equipment.

The visual/aesthetic impact of the Umgeni Project is considered to be of potential **low to moderate significance without mitigation** to people who overlook the Umgeni River.

Typical mitigation measures include the following:

- Ensuring that the Umgeni Project design features are aesthetically well designed and implemented. A landscaping plan must be developed in consultation with eThekweni Environmental Management Department and must be included in the project specifications.
- Planning of appropriate site layout, materials stockpiling and waste disposal management ahead of construction
- Investigate opportunities for re-use, e.g. filling for embankments
- Adhering to good housekeeping during the construction phase to ensure that construction camps and sites are well organised, material is neatly stacked and waste is regularly removed
- Prevention of construction litter
- Implementing appropriate waste and rubble management and disposal procedures to ensure waste and rubble is not disposed in the river or any other illegal disposal site

- Ensuring that appropriate vegetation is selected for vegetating gabion structures and that this vegetation is adequately established
- Planting of suitable indigenous trees may provide for a visual shielding of industrial sites and be considered to improve the visual appearance
- eThekweni should ensure that an EMP is implemented that covers good management and housekeeping of the construction site on topics such as stockpiling of material, waste management, litter, ablutions etc.

Despite these mitigation measures the visual impact will remain, once the Umgeni Project is completed. People who live in the area may however gradually become accustomed to the change, thereby reducing the level of long-term impact.

No issues that are specifically related to visual/aesthetic impact were raised during the public participation processes. As a result of this the visual impact is considered to be of a **low significance with mitigation** in the long term.

9 ALTERNATIVES

A number of alternative design options and alignments have been considered since the Umgeni widening projects were initiated for the provision of flood protection for the Umgeni Business Park. These options along with the 'do nothing' option are briefly outlined below.

9.1 Canal Deepening through Sand Dredging Methods

During the ISM, the issue was raised of considering an alternative option for the Umgeni Project by which flood attenuation at the Umgeni Business Park is provided through deepening of the Umgeni River by sand dredging methods.

eThekwini advised that deepening and the dredging of the river was indeed one of the alternatives that were considered in 1992 when the planning phase for the Umgeni Project was initiated.

eThekwini disregarded this option as deepening through dredging would require regular and expensive maintenance, as silt travels down and settles in the river bed continuously. In comparison the proposed flood protection works will provide a long term low maintenance option.

In addition dredging has the potential to cause periodic significant disturbance to in-stream biota and potentially heavy siltation of the water with potential significant implications to the downstream estuarine system.

The CSIR Ecological team confirmed the potential significant impact of siltation on the downstream estuarine ecology in their Preliminary Biodiversity Assessment.

Furthermore, Mr Gravelet Blondin from DWAF, in a telephone conversation on 13 July 2005, stressed that eThekwini must avoid any form of dredging during the Umgeni Project to avoid significant negative impact on water quality as was experienced during the first phase of Umgeni River Canalisation.

9.2 Providing Flood Protection Works at Alternative Sections of the River

Extensive widening and flood protection works have already been implemented along the southern embankment of the Umgeni River as described in **Section 2.2**. This has already provided some flood attenuation.

The Umgeni Project has the purpose of addressing the remaining 'bottleneck' at the river proposed river section which would provide significant additional flood protection. Flood protection at alternative sections of the northern embankment would provide little or no flood attenuation for the Umgeni Business Park.

9.3 Adjustments to the Embankment Scenarios

eThekwini commissioned SRK to model and evaluate four scenarios in their recent hydrological floodline assessment. These scenarios included different length and alignments (curves) of the embankment modifications, which included scenarios that considered the sensitivities around the Islamic graveyard. (Refer to **Section 2.3.2** for further details on the floodline study and to **Section 8.4.6** on the assessment of potential impacts on the Islamic graveyard).

Based on this assessment eThekwini arrived at the proposed scenario, for which the affected embankment section is 0.4 km shorter than the original proposal which was described in the EIA Application and Plan of Study for the Umgeni Project (see **Appendix A**). The proposed scenario avoids affecting the Islamic Graveyard whilst still providing effective flood attenuation for upstream developments.

9.4 Alternatives to the Embankment Structure Design and River Clearing

Making use of vegetated gabion structure provides for effective means of flood protection, whilst providing for the embankment to remain 'green'. For this reason eThekwini has opted to not further investigate full concrete structure alternatives. In addition to aesthetical, ecological and recreational benefits, gabion slopes are also less hazardous in terms of human safety.

In terms of river clearing, eThekwini originally proposed to keep most of the existing sandbank that forms part of the current river bank undisturbed by only 'wedging' into the embankment to clear space for the access and construction of the flood protection works. Based on recommendations from the CSIR, which were included in their Preliminary Biodiversity Assessment report, eThekwini now proposes to remove the mound of sand between the outer and inner embankment of the river to a level specified by the CSIR. This is to prevent erosion of the mound during heavy rains and minor storms, which would potentially result in sedimentation of the estuary.

9.5 Do nothing Alternative

The do nothing alternative would imply that the status quo is maintained and that the Umgeni Project is not implemented. The Umgeni Business Park would continue to be at a fairly high risk of being flooded, like it was during the 1987 floods. This could potentially have disastrous implications in terms of long term viability of the Umgeni Business Park and as such could have significant impacts on the local and even regional economy.

Property owners adjacent to the affected site would continue to be at high risk of floodwater destruction and safety hazard, which could potentially include serious injuries and even loss of life.

10 COMMENTS RECEIVED ON THE DRAFT SCOPING REPORT

ARCUS GIBB has received responses on the DSR from a number of IAPs. Copies of the responses are included in **Appendix H** and summarised in the sub-sections below. Comments on the responses are provided in **bold** format.

10.1 Department of Water Affairs and Forestry

Mr Kaverajan Pillay, DWAF Principal Water Pollution Officer, raised the following issues and concerns in a letter dated 30 September 2005.

- The proposed activity lies within the 1:100 floodline and will disturb the banks and beds of the watercourse. The activity therefore constitutes a water use and must be licenced according to Section 21 (c) or S21 (i) of the National Water Act (Act 36 of 1998).

eThekwini has submitted the relevant application forms. See letter dated 29 August 2005 and the follow up email dated 07 August 2005 in Appendix D. In addition to the application, ARCUS GIBB submitted the DSR outlining the potential environmental impacts and the proposed mitigation measures, as an attachment to support the licence application.

- The disturbance of the banks and bed of the watercourse will lead to associated impacts such as short term erosion and subsequent sedimentation and siltation of the Umgeni River. This impact needs to be mitigated to the satisfaction of DWAF office. The suspended solids in the watercourse need to be monitored frequently to detect any impact caused by the proposed activities. The results of such monitoring must be submitted to DWAF office and will be included as a licence condition.

The issue of water pollution during construction was also raised during the stakeholder meeting held on 14 June 2006. Refer to comments on Section 7.2.1 and 7.2.5 for eThekwini's response to issues regarding potential pollution of water.

The potential environmental impacts and the proposed mitigation measures related to Umgeni Project are outlined in Section 8, particularly Section 8.3.2 and 8.3.3, of this Scoping Study. Section 8.3.3 was revised to include specifics to suspended solids monitoring requirements.

eThekwini has appointed ARCUS GIBB to compile an EMP for the construction phase of the Umgeni Project. This EMP will cover the requirements for environmental mitigation and compliance during construction. These requirements will include, amongst others, the abovementioned monitoring requirements.

eThekwini will further submit the detail design to DWAF to meet their requirements.

Furthermore, it is a recommendation of this scoping study that eThekwini appoint a ECO to monitor the implementation of the EMP. During the construction phase the ECO will submit audit report to DWAF on a monthly basis.

- The impacts associated with the construction phase must be mitigated to the satisfaction of DWAF office. It is a requirement of the Department that solid waste generated from the activities at the development be disposed off at a permitted waste disposal site. Mr K Pillay of DWAF must be contacted if any other disposal route is to be followed.

Mr K Pillay from DWAF in a telephone conversation on 14 October 2005 advised that eThekwini will need to apply for the relevant safe disposal permit from eThekwini Solid Waste Management Department beforehand, should they consider disposing waste off site. Mitigation measures to ensure safe disposal of waste generated during construction will be included in the EMP.

- If waste is going to be stored at the development temporarily for final disposal at an approved waste disposal site, the developer must apply for an exemption from the issuing of waste disposal permit in terms of Section 20 of the Environment Conservation Act (Act 36 OF 1998), if the waste disposal will exceed the 90 days allowed for such an activity. The information requirements and guidelines for the preparation of such an application may be obtained from DWAF.

Section 8.3.3 was amended to incorporate these requirements. The requirements will then also be incorporated in the EMP.

- After construction, the site should be graded to ensure free flow of runoff and to prevent ponding of water.

Section 8.3.2 was amended to incorporate this requirement. The requirement will then also be incorporated in the EMP.

- Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution or cause water damage to properties further down from the site

Section 8.3.3 was amended to incorporate these requirements. The requirements will then also be incorporated in the EMP.

- Details of all sensitive areas and wetlands must be submitted to DWAF if applicable. Further discussions between eThekwini Municipality and DWAF will take place concerning the issue, if applicable.

An Orthophoto map showing the eThekweni D'Moss and other sensitive areas is attached as Figure 5, whereas the CSIR Report on Preliminary Biodiversity Assessment for the Umgeni project is attached in Appendix J.

- The EMP for construction must be submitted to DWAF for comment

DWAF has been included as a key stakeholder and an environmental authority in the Umgeni Project. ARCUS GIBB has noted the comment and undertakes to submit the EMP to DWAF for comments.

- Further requirements from DWAF will be included in the Section 21 (i) water use licence issued by DWAF.

The point is noted. Also refer to comments and responses on the Licence application in Section 10.1, second bullet.

- DWAF further advised that the responsibility rests with the applicant to identify any sources or potential sources of pollution from his undertaking and to take appropriate measures to prevent any pollution of the environment.

The point is noted. Refer to comments on similar issue raised on Section 7.2.1 and 7.2.5 and Section 10.1 above. The mitigation measures of potential pollution of water are discussed in Section 8.3.3 of the FSR.

10.2 Umgeni Water

Umgeni Water, represented by Ms Asha Ramjatan, in her email and fax dated 23 September 2005, submitted the following comments, which are included and discussed in the bullets below.

- There is no evidence to indicate that water would be monitored during all phases of the project. This information could be used to assess the potential impact.

Refer to comments on similar issue raised on Section 7.2.1 and 7.2.5 and Section 10.1 above. The mitigation measures of potential pollution of water are discussed in Section 8.3.3 of the FSR.

- Ms Ramjatan enquired whether there are any plans in place to appoint an environmental officer to ensure that all issues highlighted are adequately audited and mitigated where required.

It is a recommendation of this scoping study that eThekweni appoint a ECO to monitor the implementation of the EMP.

- Ms Ramjatan enquired on how the Umgeni project will address social upliftment during the construction phase of the project.

Impacts on the social community are assessed in Section 8.4. The most significant positive upliftment is related to sustainability of the Umgeni Business Park and the associated jobs. Use of local organisations and labourers where possible has been included as a mitigation measure in Section 8.4.1.

10.3 WESSA

Ms Di Dold, an Environmental Co-ordinator of WESSA KZN, through an email dated 14 June 2005, thanked ARCUS GIBB for the sending of the DSR and provided comments and raised concerns as detailed below:

- WESSA is never in favour of interfering with a rivers natural flow but in this case, there is no alternative now due to the past canalisation that has taken place which we believed in the 1980's was ill advised and to which we strongly objected at the time and still hold this opinion to date.

The point is noted

- WESSA are concerned that the Umgeni project is a foregone decision and regard the development as a "fait accompli". WESSA advised that they would not make any further comments about the development.

The point is noted

Ms Heather Cairns an Environmental Co-ordinator of WESSA Umhlanga Branch, through an email dated 15 September 2005, acknowledged receipt of ARCUS GIBB DSR and provided comments and raised concerns as detailed below:

- Ms Heather Cairns fully supports the comments made by Ms Di Dold that the Umgeni Project is "fait accompli" and understand that it is futile to be commenting on the project. She advised that ARCUS GIBB should not send any further material in regard to this application.

The point is noted.

10.4 eThekweni Roads Department

Mr Roy Gooden from eThekweni Roads Department in an email dated 01 September 2005, indicated that he has no comments about the Umgeni Project.

10.5 eThekweni Geotechnical Engineering

Dr Timothy Francis, Engineering geologist from Procurement and Infrastructure cluster, raised the following issues and concerns in a letter dated 07 September 2005.

He indicated that the DSR is adequate at this stage and the application is approved geotechnically, subject to the following:

- Further, more detailed geological investigations will be required prior to detailed design & construction to provide further information on:
 - (a) Water table level variations with time, drawdown rate and their affect on canal wall stability;
 - (b) Extent and composition of existing fill & refuse deposits, including organic material in the NCP lands

The scoping study identifies the existence of pockets of industrial waste as an issue of concern as discussed in Section 8.3.2. The requirement for determining the extent and composition of existing fill and refuse deposits has been included as a mitigation measure in this section.

- (c) Methane gas emissions from this refuse and method of transport and place of safe disposal of the refuse
- (d) Settlement of the new canal berms due to increased loading on underlying soft clays
- (e) Stability of canal linings such as Reno mattresses and gabion baskets and methods of their placement below the water table.

The above points have been noted in Section 8.3.2 and will be included in the EMP as a mitigation measure

10.6 eThekweni Environmental Management Department

eThekweni Environmental Management Department through a fax dated 27 October indicated that they have no objection to the proposed development. They however raised the following comments:

- A detailed EMP must be developed and approved for construction process. Appropriate measures ensuring that the river is not impacted in any way, must be included as part of the EMP.

eThekweni has appointed ARCUS GIBB to prepare an EMP for the proposed development. The point is noted and ARCUS GIBB will forward the EMP to eThekweni Environmental Health for comments as soon as is compiled.

- All material removed from site must be tested and disposed of appropriately and safe disposal certificates must be provided.

Refer to comments on similar issue raised on Section 10.1 above. The mitigation measures of potential pollution of water are discussed in Section 8.3.3.

- As proposed, the current bank is not to be left on site as this could result in gradual erosion and deposition in the estuary and this is not acceptable

Refer to mitigation and rehabilitation measures as described Section 8.3.2 to manage erosion and sedimentation. The point has been noted and will be included in the EMP as a mitigation measure

- The new, wider, gabion bank must be planted with appropriate species and must be maintained alien free, for the first year to ensure establishment of the indigenous plants. In order to achieve this, a landscaping plan must be developed in consultation with this office and this must be included in the project specifications.

The point has been noted and mitigation measure in Section 8.4.12 have been amended accordingly

- If all at possible, construction must be restricted to the drier months to limit the impact of erosion and runoff from site

Refer to Section 8.3.2.

- If negotiations are held with regards to the Inanda releases, as a minimum the ecological requirements must still be released from the dam to ensure that the estuary functionality is maintained during the period of construction.

Section 8.3.2 was amended to incorporate this requirement. The requirement will then also be incorporated in the EMP.

10.7 eThekwini Urban Design and Landscape Planning Department

eThekwini Urban Design and Landscape Planning Section in a fax dated 27 October 2005 indicated that the department has no objection in principle. They however raised the following comments and recommendations:

- The provision of a platform on the gabion embankment, for extension of the Riverside trail, is supported. Provided, security for users can be reasonably assured. Comments from Parks Department on this aspect would be important
- Alternative exit routes e.g. to Roadhouse Crescent would be a safety feature. It may be necessary to have a locked gate at the east end, with access restricted to organised group of hikers
- It is considered that a width of 1.5 m would be sufficient, with local widenings at intervals as resting places/ view sites
- A timber or polywood safety rail is recommended

- A covering or partial covering of soil over the gabions is recommended to promote the establishment of plant cover, for which indigenous, endemic species should be used
- The proposed planting of trees on the top platform is supported, to visually screen the back yards of the remaining businesses. Species such as coral trees and wild figs would be appropriate. It is expected that overtime these would seed additional trees on the embankment itself

Section 8.4.5 was amended to incorporate this requirement. The requirement will then also be incorporated in the EMP

10.8 eThekweni Electricity

eThekweni Electricity through a fax from eThekweni Development Management unit dated 27 October 2005 indicated that their department could be affected by the development and further raised the following issues:

- The Department 132kV overhead line from the Durban North Substation to the Parkhill Substation could be affected by the development
- Any canalisation within 20m of the tower will require written approval by a professional civil engineer to ensure that the tower foundation are not undermined
- No servitude has been registered over council owned land and the river, however, the servitude width would have be 35m wide i.e. 17.5 m on either side of the centre line. Ground levels within the servitude/ wayleave area may not be changed
- Furthermore, it is essential that the safety clearances of the Occupational Health and Safety Act are adhered to at all times when working in or crossing an overhead transmission line servitude. This implies that nothing may approach within 3.8 metres of the 132kV conductors, even for assessing the height of conductors
- eThekweni Electricity advised that it is the responsibility of the applicant to check eThekweni Electricity main records (held in the Drawing Office at eThekweni Electricity Headquarters, I Jelf Taylor Crescent), for the presence of underground electrical services. In addition, should any overhead and/ or servitude be affected, the specific permission of the head of Electricity be sought regarding any proposed development

The points are noted and a reference to the overhead line has been included in Section 5.3.4 and Section 8.4.3. ARCUS GIBB has amended Figure 1 of the DSR to include the 132kV overhead transmission line, the support structures and the Parkhill substation. Refer to Figure 1 for further details.

It is recommended that eThekweni undertake detailed survey to identify all the existing services within the project area before commencing with the development.

The mitigation measures in Section 8.4.3 have been amended to incorporate the eThekweni Electricity requirements.

10.9 Other Departments within eThekweni

eThekweni Stormwater and Coastal Engineering, eThekweni Traffic Authority, eThekweni Water and Sanitation, eThekweni Disaster Management, eThekweni Fire Department and eThekweni Health Services raised no concerns or objections concerning the Umgeni Project.

11 CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

In keeping with the long term development plans for the Umgeni Business Park, the eThekweni Coastal, Stormwater and Catchment Management Department plans to continue with the second phase of widening a section of the Umgeni River to further reduce the risk of flooding of the park during major flood events.

eThekweni phased in the widening when the southern embankment of the relevant section of the Umgeni River was widened during the mid 1980s. A section of the Umhlangane River, a tributary to the Umgeni River, was also widened at the time.

eThekweni proposes to further widen the Umgeni River by providing effective flood protection works consisting of a vegetated gabion structure along approximately 1 km of its northern embankment. The riverbed will not be lined. Existing buildings, paving, pipelines and other manmade structures within the 'new' riverbed will be removed. Affected sewer and water mains are provided for in the proposed design and will accordingly be relocated. The design of the embankment also makes provision for a foot trail above the floodline. Based on advise received from the CSIRs Preliminary Biodiversity Assessment, eThekweni proposes to remove the mound of soil and sand from the existing embankment between the proposed new embankment and the inner embankment of the normal (no-flood) flow path.

Approximately 10 business properties, most of which were already impacted by the 1987 floods, will be directly affected by the widening project. With due care during construction, the project will have no direct impact on the rail and road infrastructure that traverses the river.

The Umgeni Project could potentially have an impact on the surrounding biophysical and human environments. Accordingly, this scoping study was undertaken with the aim of investigating and identifying issues, concerns and queries from IAPs that could potentially result from this project. The scoping study further investigated the consequent effects of the proposed development on the biophysical and socio-economic environment.

Table 11.1 and **Table 11.2** respectively summarises the environmental issues relating to the construction and operation of the proposed Umgeni Project that have been identified as being important and were investigated in the Scoping Study.

The following key conclusions are drawn from the scoping study:

- The proposed widening is strategically required to provide for a significant reduction in risk of flooding of the Umgeni Business Park during major flood events and thus has a positive impact on the long term viability of this important economic centre.
- From a biophysical perspective the proposed site consists of an essentially disturbed secondary habitat and as such is not considered to be an environmentally sensitive area. However the downstream estuary requires protection from potential impact during the construction phase.

- From a socio-economic perspective the key issue concerns the direct impact on affected businesses and land owners, which will be dealt with through acquisition procedures. It was noted that the MEC of Local Government and Traditional Affairs granted eThekweni Real Estate Department permission to proceed with the expropriation of land and/or servitude rights to allow the Umgeni River Project. In addition, the project would clear the area below the bridges, which could potential enable ingress and establishment of squatters, vagrants and criminals seeking shelter under the bridges.
- Implementation of adequate mitigation measures would reduce all potential impacts to a low significance. This is apart from the issue concerning the potential economic impact on affected property and business owners as well as the potential social safety issue concerning informal occupation of the site below the bridges, which may remain at moderate significance even with mitigation.

Table 11.1: Summary of Potential Environment Impact Issues – Construction Stage

IMPACTED ENVIRONMENT		SIGNIFICANCE	
		Without mitigation	With mitigation
Biophysical	Topography and Drainage	Low	Low
	Geology and Soils	High	Low
	Ecology	Moderate to High	Low
	Water Quality	Moderate	Low
	Flora	Moderate to High	Low
	Fauna	Moderate to High	Low
Socio Economic	Economic (eThekweni region)	Low	Low
	Economic (directly affected businesses)	High	Moderate to Low
	Interruption of Services	Low to Moderate	Low
	Traffic and Traffic Infrastructure	Moderate	Low
	Recreation and Tourism	Low	Low
	Culture and Heritage	Moderate	Low
	Community Safety	Moderate to High	Low
	Community Security	Moderate	Low
	Community Relationship	Moderate	Low
	Air quality (local)	Low to Moderate	Low
	Noise	Low to Moderate	Low
	Visual/Aesthetics	Low to Moderate	Low

Table 11.2: Summary of Potential Environment Impact Issues – After Implementation

IMPACTED ENVIRONMENT		SIGNIFICANCE	
		Without mitigation	With mitigation
Biophysical	Drainage (upstream)	High (overall positive)	High (overall positive)
	Drainage (downstream estuary)	Low	Low
	Topography	Low	Low
	Geology and Soils	Moderate (overall positive)	Moderate (overall positive)
	Ecology	Low	Low
	Water Quality	Low	Low
	Flora	Low	Low
	Fauna	Low	Low
Socio Economic	Economic (eThekweni region)	High (overall positive)	High (overall positive)
	Economic (directly affected businesses)	High	Moderate to Low
	Land use	Low to Moderate	Low
	Heritage	Low to Moderate	Low
	Traffic and Traffic Infrastructure	Low	Low
	Recreation and Tourism	Moderate (overall positive)	Moderate (overall positive)
	Culture and Heritage	Low	Low
	Community Safety	Low	Low
	Community Security	Moderate to High	Moderate to Low
	Air quality	Low	Low
	Noise	Low	Low
	Visual/Aesthetics	Low to Moderate	Low

11.2 Recommendations

ARCUS GIBB strongly recommends that the following key issues be addressed as conditions of approval of the project:

- eThekwini needs to await DWAFs permission before commencing with construction
- eThekwini Real Estate must follow all the legal procedures during land acquisition and affected property owners must be compensated at market related cost
- eThekwini should include aesthetically and appropriate landscaping features in the design of the embankment
- eThekwini should consider promoting inclusion of the affected river embankment into a formalised park area for protection against ingress of squatters, vagrants and criminals and accordingly liaise with the eThekwini Parks Department
- Construction activities should in no way impact on the river water quality and estuary
- Construction activities should in no way impact on the Islamic Graveyard
- Public safety must be considered during planning and construction site layout and management
- eThekwini must undertake a detailed survey to incorporate all the existing water, sewage and electrical services in their detail design plans of the Umgeni project
- eThekwini must liaise with the eThekwini Traffic and Transportation Department on any envisaged traffic impacts during construction
- eThekwini must liaise with eThekwini Electricity Department on any envisaged overhead/and or servitude impacts during construction. Strict adherence to safety clearances to overhead lines are required at all times when working in or crossing an overhead transmission line servitude
- Neighbouring Property owners closer to the river widening site must be informed when the construction commences
- An Environmental Management Plan (EMP) must be drawn up for the construction phase of the project. It is to include environmental specifications to cover issues such as the management of social impacts, control of soil erosion, management of hazardous substances and wastes, rehabilitation of areas that will be disturbed by construction. The Environmental Specifications are to be included in construction contracts and enforced on site.

Subject to implementation of the proposed mitigation measures, as described in the report and the abovementioned conditions, it is recommended that the proposed Umgeni Project be approved.

12 WAY FORWARD

This report serves as the Final Scoping Report for the proposed Widening of the Lower Umgeni River. Comments from IAPs on the Draft Scoping Report have been incorporated into this report. This report has been prepared for submission to DAEA for their consideration. DAEA may decide on one of the following:

- Issue an authorisation to undertake the development with or without conditions
- The Final Scoping Report be supplemented by a full EIA
- Decline the application

Once a decision is made the DAEA will release a Record of Decision that details the final outcome of the application. A feedback letter will be sent to all registered IAPs detailing the Record of Decision.

IAPs have 30 days, after the publication of the Record of Decision, to appeal the decision made by the authorities.

For any further clarification, kindly contact

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13 REFERENCES

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Document Control Sheet

DOCUMENT CONTROL SHEET (FORM IP180/B)

CLIENT : eThekwini Coastal, Stormwater & Catchment Management Department

PROJECT : Umgeni River Widening EIA

PROJECT No: J25130

TITLE : Scoping Report

	Prepared by	Reviewed by	Approved by
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DSR – Draft Scoping Report

FSR – Final Scoping Report

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